

# European Union's fishing fleet: evolution, challenges and future

Final Report



Bastardie F., Wakeford R.C., Torreele E., Aranda M., Clark J., Doering R., Ligas A., Mele I., Castresana J., Gabina G., Aers F., Maes S.M., Sabatella R., Malvarosa L., Sartor P., Prelezo R., Fernandes A.C., Coelho R., Pereira J., Rakowski M., Mytlewski A., De Rijcke H., Nielsen J.R., Berg, C., W., van de Pol L., Sulanke E., De Clercq A., Clark J., Fitton W.  
March 2026

**EUROPEAN COMMISSION**

European Climate, Infrastructure and Environment Executive Agency  
Unit D3 — Sustainable Blue Economy

*Contact: CINEA EMFAF CONTRACTS*

*E-mail: [CINEA-EMFAF-CONTRACTS@ec.europa.eu](mailto:CINEA-EMFAF-CONTRACTS@ec.europa.eu)*

*European Commission  
B-1049 Brussels  
BELGIUM*

# **European Union's fishing fleet: evolution, challenges and future**

Specific Contract No.01

Implementing CINEA/2023/OP/0002

This report should be cited as:

Authors: Bastardie F., Wakeford R.C., Torreele E., Aranda M., Clark J., Doering R., Ligas A., Mele I., Castresana J., Gabina G., Aers F., Maes S.M., Sabatella R., Malvarosa L., Sartor P., Prellezo R., Fernandes A.C., Coelho R., Pereira J., Rakowski M., Mytlewski A., De Rijcke H., Nielsen J.R., Berg, C., W., van de Pol L., Sulanke E., De Clercq A. Clark, J., Fitton, W. (2026). *European Union's fishing fleet: evolution, challenges and future*. Publications Office of the European Union, 2026, doi: 10.2926/7668818

The information and views set out in this study are those of the author(s) and do not necessarily reflect the official opinion of CINEA or of the Commission. Neither CINEA nor the Commission can guarantee the accuracy of the data included in this study. Neither CINEA, the Commission or any person acting on their behalf may be held responsible for the use that may be made of the information contained therein.



Manuscript completed in March 2026

This document has been prepared for the European Commission however it reflects the views only of the authors, and the European Commission is not liable for any consequence stemming from the reuse of this publication.

Luxembourg: Publications Office of the European Union, 2026

© European Climate, Infrastructure + Environment Executive Agency, 2026



The reuse policy of European Commission documents is implemented by Commission Decision 2011/833/EU of 12 December 2011 on the reuse of Commission documents (OJ L 330, 14.12.2011, p. 39). Unless otherwise noted, the reuse of this document is authorised under a Creative Commons Attribution 4.0 International (CC BY 4.0) licence (<https://creativecommons.org/licenses/by/4.0/>). This means that reuse is allowed provided appropriate credit is given and any changes are indicated.

## Contents

|          |                                                                                              |           |
|----------|----------------------------------------------------------------------------------------------|-----------|
| <b>1</b> | <b>Introduction .....</b>                                                                    | <b>1</b>  |
| 1.1      | Background .....                                                                             | 1         |
| 1.2      | Main objectives and structure of the report.....                                             | 2         |
| <b>2</b> | <b>Historic policy background and milestones that shaped EU fleet policy .....</b>           | <b>4</b>  |
| 2.1      | Policy evolution leading to 2013 CFP reform .....                                            | 4         |
| 2.2      | Developments following the 2013 CFP reform .....                                             | 7         |
| 2.3      | Tools to support the EU fleet policy .....                                                   | 12        |
| 2.3.1    | Scientific advisory bodies and monitoring tools .....                                        | 12        |
| 2.3.2    | Financial instruments for supporting the fleet policy .....                                  | 14        |
| <b>3</b> | <b>State of play of the EU fishing fleet capacity and fleet mapping .....</b>                | <b>16</b> |
| 3.1      | EU Fleet Capacity Management.....                                                            | 16        |
| 3.2      | Status of the EU fishing capacity measured with kW and GT.....                               | 19        |
| 3.3      | Mapping the EU Fishing Capacity per fishery .....                                            | 24        |
| 3.3.1    | Disaggregating and standardising fishing fleet capacity into fisheries-related capacity..... | 24        |
| 3.3.2    | Linking fleet capacity metrics to stock status.....                                          | 27        |
| <b>4</b> | <b>Outlook of the EU fleet balance and case studies .....</b>                                | <b>38</b> |
| 4.1      | Balance indicators used to assess EU fleet.....                                              | 38        |
| 4.2      | Regional trends in imbalance .....                                                           | 39        |
| 4.2.1    | North Atlantic Ocean (NAO).....                                                              | 39        |
| 4.2.2    | Mediterranean and Black Seas (MBS) .....                                                     | 40        |
| 4.2.3    | Other fishing regions (OFR).....                                                             | 40        |
| 4.3      | Balance capacity of fleet segments at Member State level.....                                | 44        |
| 4.4      | Case studies of drivers for imbalance and persistence.....                                   | 48        |
| <b>5</b> | <b>Policy approaches outside the EU .....</b>                                                | <b>55</b> |
| <b>6</b> | <b>Definition of fishing capacity .....</b>                                                  | <b>65</b> |

|          |                                                                                                                               |            |
|----------|-------------------------------------------------------------------------------------------------------------------------------|------------|
| 6.1      | Alternative or additional elements for defining fleet capacity .....                                                          | 65         |
| 6.1.1    | Safety-, Net- and Social-related tonnage .....                                                                                | 67         |
| 6.1.2    | Other concepts for defining fishing capacity .....                                                                            | 72         |
| 6.2      | Assessing the feasibility of increasing a vessel's GT and/or kW without increasing its ability to catch fish.....             | 78         |
| 6.2.1    | Evaluate the degree of correlation between fishing capacity (GT or kW) and harvesting capacity ("ability to catch fish")..... | 79         |
| 6.2.2    | Technological advances affecting the harvesting capacity .....                                                                | 81         |
| 6.3      | Vessel modernisation for energy transition .....                                                                              | 84         |
| 6.3.1    | Improving energy efficiency .....                                                                                             | 89         |
| 6.3.2    | Using alternative fuels for the vessel propulsion .....                                                                       | 90         |
| 6.3.3    | Capacity reallocation among fleet segments.....                                                                               | 98         |
| 6.3.4    | The case of the EU fleet of the Mediterranean Sea.....                                                                        | 100        |
| <b>7</b> | <b>Fishing capacity management.....</b>                                                                                       | <b>101</b> |
| 7.1      | Impacts of fishing capacity management in EU (including limitations and barriers to its modernisation or renewal).....        | 101        |
| 7.2      | Main results from a questionnaire to Member States.....                                                                       | 105        |
| 7.3      | Unused fishing capacity .....                                                                                                 | 106        |
| 7.4      | Proposed measures to address and reallocate capacity effectively... ..                                                        | 111        |
| 7.4.1    | Overcoming barriers to operating innovations.....                                                                             | 111        |
| 7.4.2    | Fishing capacity management benefitting from rebuilding stocks and restoring ecosystems.....                                  | 113        |
| 7.4.3    | Fishing capacity management to support the energy transition in the fisheries sector.....                                     | 115        |
| 7.4.4    | Fishing capacity management to promote a new generation to enter the sector.....                                              | 116        |
| 7.4.5    | Engage stakeholders in critical thinking of capacity limitations and barriers .....                                           | 117        |
| 7.5      | Adjustment phase to new management measures in the Effort management regime of the Mediterranean and Black Seas .....         | 118        |
| <b>8</b> | <b>Summary and Recommendations .....</b>                                                                                      | <b>120</b> |
| 8.1      | Recommendations for improving the management of the EU fleet....                                                              | 125        |
| <b>9</b> | <b>References.....</b>                                                                                                        | <b>136</b> |
|          | <b>Annex 1: 2023 EU Fleet Capacity Status .....</b>                                                                           | <b>150</b> |
|          | <b>Annex 2: Overview of EU cases studies .....</b>                                                                            | <b>155</b> |

|                                                                                                                               |            |
|-------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>Annex 3: International Case studies .....</b>                                                                              | <b>304</b> |
| <b>Annex 4: Link between fishing capacity metrics and harvesting capacity<br/>.....</b>                                       | <b>329</b> |
| <b>Annex 5: Relationships with vessel physical characteristics to<br/>complement current GT and kW capacity metrics .....</b> | <b>334</b> |
| <b>Annex 6: The Irish case around the request to increase GT on safety<br/>grounds .....</b>                                  | <b>337</b> |
| <b>Annex 7: The gross tonnage for safety (GT_safety) declaration in the EU<br/>Fleet Register .....</b>                       | <b>340</b> |
| <b>Annex 8: Relationships between fleet capacity metrics and gear size and<br/>geometry .....</b>                             | <b>342</b> |
| <b>Annex 9: Auxiliary power in the EU Fleet Register .....</b>                                                                | <b>346</b> |
| <b>Annex 10: Estimates for converting one unit of capacity from one fishery<br/>to another .....</b>                          | <b>348</b> |
| <b>Annex 11: Illustrative images of different technology installation designs<br/>.....</b>                                   | <b>356</b> |
| <b>Annex 12: Challenges in funding support to managing EU fishing capacity<br/>.....</b>                                      | <b>363</b> |

## List of Tables

|                                                                                                                                                                                                                                                     |    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| Table 1 – Key policy legislations, documents and regulations with objectives and outcomes that shaped the EU Fleet Policy.....                                                                                                                      | 11 |
| Table 2 – Overview of key EU advisory bodies and scientific monitoring tools within the CFP including their purpose and evaluation.....                                                                                                             | 13 |
| Table 3 – Overview of key fleet capacity management tools within the CFP including their purpose and evaluation.....                                                                                                                                | 17 |
| Table 4 – Mapping fleet capacity as extracted from the EU Fleet Register (records up to the 1 <sup>st</sup> of January 2024) .....                                                                                                                  | 19 |
| Table 5 – Different levels of fishing fleet segmentations for describing the EU fleet capacity .....                                                                                                                                                | 25 |
| Table 6 – Percentage of fishing effort (total kW.days and GT.days between 2019-2022, covering only EU fleet active in Northeast Atlantic Ocean) directed towards stocks fished sustainability (i.e. $F/F_{MSY} < 1$ ), or otherwise .....           | 28 |
| Table 7 – Balance indicators with numbers of fleet segments in balance or out of balance, by region: North Atlantic Ocean (NAO), Mediterranean and Black Sea (MBS) and Other Fishing Regions (OFR).....                                             | 42 |
| Table 8 – Balance indicators with numbers of active vessels in balance or out of balance, by region: North Atlantic Ocean (NAO), Mediterranean and Black Sea (MBS) and Other Fishing Regions (OFR).....                                             | 43 |
| Table 9 – Balance indicators with numbers of fleet segments in balance or out of balance, by Member State in 2022, including trends between 2018-2022 .....                                                                                         | 44 |
| Table 10 – Main findings from the case study on demersal trawl fisheries in the Western Mediterranean (France, Italy and Spain), including stakeholders' perceptions of the main drivers of fleet imbalance. See Annex 2 for detailed findings..... | 50 |
| Table 11 – Main findings from the case study on Portuguese pelagic longline fleets in external waters, including stakeholders' perceptions of the main drivers of fleet imbalance. See Annex 2 for detailed findings.....                           | 51 |
| Table 12 – Main findings from the case study on Spanish fleets in the Atlantic EU Western Waters, including stakeholders' perceptions of the main drivers of fleet imbalance. See Annex 2 for detailed findings.....                                | 52 |
| Table 13 – Main findings from the case study on fisheries in the southern Baltic Sea (Polish example), including stakeholders' perceptions of the main drivers of fleet imbalance. See Annex 2 for detailed findings.....                           | 53 |
| Table 14 – Main findings from the case study on mixed demersal fisheries (Denmark, Belgium, The Netherlands and Germany), including stakeholders' perceptions of the main drivers of fleet imbalance. See Annex 2 for detailed findings.....        | 54 |
| Table 15 – Main findings Case Study Iceland, indicating management measures, outcomes and applicability in the EU context .....                                                                                                                     | 58 |

|                                                                                                                                                                                                                                                       |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Table 16 – Main findings Case Study South African Cape hake fishery, indicating management measures, outcomes and applicability in the EU context.....                                                                                                | 59  |
| Table 17 – Main findings Case Study New Zealand, indicating management measures, outcomes and applicability in the EU context .....                                                                                                                   | 60  |
| Table 18 – Main findings Case Study USA Bering Sea and Aleutian Islands (BSAI) Pollock fishery, indicating management measures, outcomes and applicability in the EU context.....                                                                     | 61  |
| Table 19 – Main findings Case Study China, indicating management measures, outcomes and applicability in the EU context .....                                                                                                                         | 62  |
| Table 20 – Main findings Case Study Norway, indicating management measures, outcomes and applicability in the EU context .....                                                                                                                        | 63  |
| Table 21 – Main findings Case Study United Kingdom, indicating management measures, outcomes and applicability in the EU context .....                                                                                                                | 64  |
| Table 22 – Safety and social tonnage related measures in fishing vessels extracted from (European Commission, 2016) and their potential impact on vessel dimensions .....                                                                             | 68  |
| Table 23 – Applying GT calculation from the formula given in Council Regulation (EC) No. 3259/94 to two hypothetical vessels of 18 and 24 m in length in overall (LOA), with vessel characteristics as defined by Regulation (EU) 2017/1130 ( ) ..... | 78  |
| Table 24 – Summary elaborated from the EU techno-economic analysis 2024                                                                                                                                                                               | 85  |
| Table 25 – Changes in vessel dimensions for different decarbonisation modifications (see Annex 11) .....                                                                                                                                              | 93  |
| Table 26 – Fishing gear characteristics that would define harvesting capacity and possible limiting factors .....                                                                                                                                     | 99  |
| Table 27 – Identified specific EU sea basins challenges in managing the EU fleet capacity and impacts of policy on the EU fleet .....                                                                                                                 | 104 |
| Table 28 – Evolution of inactive vessels from 2013-2022 .....                                                                                                                                                                                         | 107 |
| Table 29 – Number of overfished stocks in EU waters in the NEA.....                                                                                                                                                                                   | 109 |
| Table 30 – Number of stocks by year for which fishing mortality (F) was above/below FMSY in the Mediterranean and Black Sea .....                                                                                                                     | 109 |
| Table 31 – Deduced from the EU fleet register for all vessels present in the register on the 1st of January 2024 .....                                                                                                                                | 150 |
| Table 32 – Average GT of the Western Mediterranean trawlers, by country and length classes, 2023.....                                                                                                                                                 | 161 |
| Table 33 – List of key stakeholder groups relevant to fisheries exploiting demersal stocks within the Western Mediterranean multiannual plan.....                                                                                                     | 163 |
| Table 34 – Trend in $F/F_{MSY}$ and $SSB/SSB_{2003}$ (based on 27 stocks) in the Western Mediterranean (indicators reference year 2021).....                                                                                                          | 164 |
| Table 35 – Balance assessment by demersal fleet segments in Western Mediterranean according to national Fleet capacity reports 2024, indicator reference year 2022 .....                                                                              | 169 |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Table 36 – List of stakeholder groups considered relevant for this case study and that were contacted to respond to the questionnaire. The number of people by entity, affiliation and their roles is included .....                                                                                                                                                                                                                                                                                       | 190 |
| Table 37 – Summary of some key ideas taken from the responses provided by each stakeholder group by question.....                                                                                                                                                                                                                                                                                                                                                                                          | 192 |
| Table 38 – Evolution of Spanish fleet size in the three main fishing grounds .                                                                                                                                                                                                                                                                                                                                                                                                                             | 210 |
| Table 39 – Evolution of the global indicators by fleet segment in the North Atlantic, according to the National Fleet Reports.....                                                                                                                                                                                                                                                                                                                                                                         | 214 |
| Table 40 – Spanish fleet segments operating in the North Atlantic region referred in this report.....                                                                                                                                                                                                                                                                                                                                                                                                      | 215 |
| Table 41 – Number of segments with an estimation of the SHI indicator .....                                                                                                                                                                                                                                                                                                                                                                                                                                | 218 |
| Table 42 – Number of segments with an estimation of the SAR indicator .....                                                                                                                                                                                                                                                                                                                                                                                                                                | 218 |
| Table 43 – Number of segments with an estimation of the CR/BER indicator                                                                                                                                                                                                                                                                                                                                                                                                                                   | 218 |
| Table 44 – Number of segments with an estimation of the ROFTA indicator .                                                                                                                                                                                                                                                                                                                                                                                                                                  | 219 |
| Table 45 – Number of segments with an estimation of the FecR indicator.....                                                                                                                                                                                                                                                                                                                                                                                                                                | 220 |
| Table 46 – Fleet segments in the Action Plans 2020 – 2024 .....                                                                                                                                                                                                                                                                                                                                                                                                                                            | 220 |
| Table 47 – Changes in Polish fishing fleet size, GT and kW in years 2014-2023 .....                                                                                                                                                                                                                                                                                                                                                                                                                        | 238 |
| Table 48 – Total Allowable Catches (TAC) in the Baltic Sea for 2024.....                                                                                                                                                                                                                                                                                                                                                                                                                                   | 239 |
| Table 49 – List of key stakeholder groups relevant to fisheries exploiting South Baltic Sea .....                                                                                                                                                                                                                                                                                                                                                                                                          | 242 |
| Table 50 – Fleet balance indicators in 2018-2023* .....                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 244 |
| Table 51 – Relevant fleet segments form mixed demersal fisheries in the North Sea.....                                                                                                                                                                                                                                                                                                                                                                                                                     | 255 |
| Table 52 – List of key stakeholders approached for participation in the questionnaire.....                                                                                                                                                                                                                                                                                                                                                                                                                 | 268 |
| Table 53 – Quota uptake for economically important North Sea mixed demersal species for Belgium. Values are shown in percentage (%) .....                                                                                                                                                                                                                                                                                                                                                                  | 272 |
| Table 54 – Quota uptake of economically important North Sea mixed demersal species for Denmark. Values are shown in percentage (%).....                                                                                                                                                                                                                                                                                                                                                                    | 272 |
| Table 55 – Quota uptake of economically important North Sea mixed demersal species for the Netherlands.....                                                                                                                                                                                                                                                                                                                                                                                                | 273 |
| Table 56 – Vessels with a registered gross safety tonnage (GT_safety) by country and primary gear type. Numbers of vessels and actual total GT_safety in parenthesis.....                                                                                                                                                                                                                                                                                                                                  | 340 |
| Table 57 – Percent of auxiliary kW power installed compared to kW power of the main engine as declared in the EU Fleet Register (records in Jan 2014), pooled by categories of the primary gear. Auxiliary power “includes all installed engine power not included under the heading ‘Power of the main engine’. The accuracy of the reporting of this variable is unknown and does not seem to cover all MS, even if this reporting is compulsory as stipulated in Regulation (EU) 2017/218 Annex 1. .... | 347 |

Table 58 – Percentage of eligible vessel and 2023 capacity for the EMFAF funding, if the <24m criterion only would apply. In effect, a vessel should also belong to a segment that is not perceived as out of balance to be eligible, while such information is not accounted for in the table estimates ..... 366



## List of Figures

|                                                                                                                                                                                                                                                                                                     |     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Figure 1 – Registered vessels in the EU Fleet Register on the 31 <sup>st</sup> of December each year for the top five Member States in terms of (left) Number of vessels registered, and (right) kW .....                                                                                           | 18  |
| Figure 2 – Proportion of Gross tonnage GT (GT) or kW and unused tonnage (GTunused) or unused kW (kW Unused) left under the country-specific capacity ceilings as per 1 <sup>st</sup> of January 2024 .....                                                                                          | 21  |
| Figure 3 – Mapping the kW of the EU fleet across FAO areas within the NAO and MBS ecoregions .....                                                                                                                                                                                                  | 22  |
| Figure 4 – Mapping the GT of the EU fleet across FAO areas within the NAO and MBS ecoregions .....                                                                                                                                                                                                  | 23  |
| Figure 5 – Country Effort directed towards sustainably vs. unsustainably fished stocks in the Northeast Atlantic Ocean.....                                                                                                                                                                         | 29  |
| Figure 6 – Partition of fishing capacity between vessel size and fishing techniques used by the EU fleet active in the NAO .....                                                                                                                                                                    | 30  |
| Figure 7 – Partition of the fishing capacity between fishing techniques and countries for the EU fleet active in the NAO .....                                                                                                                                                                      | 30  |
| Figure 8 – Partition of the fishing capacity for highest 3 countries by catch volume .....                                                                                                                                                                                                          | 31  |
| Figure 9 – Presence of sustainable fisheries within Annual Economic Report coarser segmentation.....                                                                                                                                                                                                | 32  |
| Figure 10 – Presence of sustainable fisheries within Annual Economic Report coarser segmentation.....                                                                                                                                                                                               | 34  |
| Figure 11 – Hypothetical split of the overall GT of a fishing vessel into four subcomponents: GT_energy_transition, GT_harvesting_cap and GT_safety, and GT_wellbeing. Note that the area covered by each square is hypothetical and does not relate to any specific vessel arrangement known ..... | 75  |
| Figure 12 – Time series of catch per GT, all EU fleet.....                                                                                                                                                                                                                                          | 84  |
| Figure 13 – A decision flow chart under different probabilities (very low, low, considerable) for requiring extra vessel capacity likely needed in addressing energy transition challenges.....                                                                                                     | 88  |
| Figure 14 – Fuel volume taken by 10 megawatt-hour (MWh) of energy for different fuels.....                                                                                                                                                                                                          | 91  |
| Figure 15 - Percentage of extra weight given in a 55-litre gasoline tank when considering different alternative fuels .....                                                                                                                                                                         | 91  |
| Figure 16 – Hypothetical scenarios to show alternative outcomes under both EU fishing capacity ceiling for GT (blue bars) and ability to catch fish (the “harvesting capacity”) with a harvesting cap to prevent overfishing on stocks (yellow bars). .....                                         | 103 |
| Figure 17 – Trend of capacity (number of vessels and GT) by country for the Western Mediterranean trawling fleets, 2013-2023 .....                                                                                                                                                                  | 159 |

|                                                                                                                                                                                                       |     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Figure 18 – Trend of capacity (number of vessels and GT) by length classes for the Western Mediterranean trawling fleets, 2013-2023.....                                                              | 160 |
| Figure 19 – Trend in main economic indicators for demersal trawlers operating in Western Mediterranean.....                                                                                           | 165 |
| Figure 20 – Trend in number of vessels and days at sea (on the left) and live weight of landings and average price (on the right), demersal trawlers, Western Mediterranean, year 2018 and 2022 ..... | 165 |
| Figure 21 - Composition of total value of landings, main species, demersal trawlers, Western Mediterranean, year 2018 and 2022.....                                                                   | 166 |
| Figure 22 – Trend in main operational costs for demersal trawlers, Western Mediterranean, year 2018 and 2022 .....                                                                                    | 166 |
| Figure 23 – Net profit margin for demersal trawlers by vessel length by Member State, Western Mediterranean, year 2018 and 2022.....                                                                  | 167 |
| Figure 24 – Number of questionnaires collected by stakeholder group and nationality.....                                                                                                              | 170 |
| Figure 25 – Distribution of effort (number of hooks) in 5x5 degrees, by the Portuguese pelagic longline fleet, between 2012-2023.....                                                                 | 187 |
| Figure 26 – Catch composition (tonnes) of the Portuguese fleet operating in the Atlantic, between 1990 and 2023 .....                                                                                 | 188 |
| Figure 27 – Representativeness of respondents by stakeholder group.....                                                                                                                               | 191 |
| Figure 28 – Number of respondents, by entity within each stakeholder group                                                                                                                            | 191 |
| Figure 29 - Evolution of the active Spanish fishing fleet.....                                                                                                                                        | 210 |
| Figure 30 - Evolution of the active Spanish fishing fleet in the NAO region....                                                                                                                       | 211 |
| Figure 31 - Evolution of prices of Venus clam in Gulf of Cadiz.....                                                                                                                                   | 222 |
| Figure 32 - Evolution of the fishery in number of vessels .....                                                                                                                                       | 222 |
| Figure 33 - Evolution of energy cost in the fishery.....                                                                                                                                              | 223 |
| Figure 34 - Evolution of the ROFTA indicator in the dredge segments (2018 – 2022).....                                                                                                                | 224 |
| Figure 35 – Share of catches of Polish Baltic Sea fishing fleet in 2023 by main species .....                                                                                                         | 239 |
| Figure 36 – Number of vessels active in the North Sea involved in mixed demersal fisheries for 2013-2023.....                                                                                         | 257 |
| Figure 37 – Gross tonnage of vessels in the North Sea involved in mixed demersal fisheries for 2013-2023.....                                                                                         | 258 |
| Figure 38 – Total power (kW) of vessels in the North Sea involved in mixed demersal fisheries for 2013-2023.....                                                                                      | 259 |
| Figure 39– Average days at sea (DaS) of vessels in the North Sea involved in mixed demersal fisheries for 2013-2023 .....                                                                             | 261 |
| Figure 40 – Activity level of vessels in the North Sea involved in mixed demersal fisheries during the period 2013-2023.....                                                                          | 262 |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Figure 41 – Total value of landings per fleet segment involved in mixed demersal fisheries in the NSEA from 2013-2023 .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 277 |
| Figure 42 – Proportion of each cost per MS and per fleet segment involved in mixed demersal fisheries in the North Sea from 2013-2023.....                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 278 |
| Figure 43 – Net profit per fleet segment involved in mixed demersal fisheries in the North Sea from 2013-2023 .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 279 |
| Figure 44 – Evolution on fleet size – number of vessels after ITQs implementation in Iceland .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 306 |
| Figure 45 – Fleet size evolution in South Africa in number of vessels.....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 309 |
| Figure 46 – Fleet size evolution in Norway in number of vessels .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 323 |
| Figure 47 – Evolution of the UK fleet capacity in terms of vessels and power                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 327 |
| Figure 48 – An illustrative treemap showing the split of vessel GT into subcomponents .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 330 |
| Figure 49 – Draft of mapping the possible interactions/relationships (positive feedback in solid link, negative feedback in dashed link) between an increase in fleet capacity (+LOA, +GT, +kW, +auxkW, highlighted in red as the ones managed by the fleet policy) or ageing (+Age), the resulting fishing capacity, and the risk for imbalance (i.e. +fishing pressure), or opportunities for safety improvements, and fuel use reduction. As there is the presence of contradictory effects (e.g. a larger engine room can fit zero-carbon motors, or increase the kW), the net outcome is uncertain. .... | 332 |
| Figure 50 – Fitted models relationships obtained from analysing the Extended EU Fleet Register records. Outliers likely correspond to recording errors (including entering values in different units, etc.). Black line: simple linear models, Green line: power models .....                                                                                                                                                                                                                                                                                                                                 | 335 |
| Figure 51 – A relationship between fish hold volume (FHV) and LOA for surveyed Spanish purse seiners for tuna listed at the IATTC records (n=259) as reported in Restrepo and Justel-Rubio 2016 - ISSF Technical Report 2016-10 .....                                                                                                                                                                                                                                                                                                                                                                         | 336 |
| Figure 52 – A relationship between fish hold volume (FHV) and GT for surveyed Spanish purse seiners for tuna listed at the IATTC records (n=148) as reported in Restrepo and Justel-Rubio 2016 -ISSF Technical Report 2016-10 .....                                                                                                                                                                                                                                                                                                                                                                           | 336 |
| Figure 53 – Gross safety tonnage (GT_safety) as taken from the EU Fleet Register a) Actual GT_safety (removing the two figures >100t) and b) as a proportion of GT .....                                                                                                                                                                                                                                                                                                                                                                                                                                      | 341 |
| Figure 54 – The relationship between fishing circle and vessel power. The black line is the segmented regression, and the coloured lines show the GLM fitted to data above the breakpoint of 934 hp .....                                                                                                                                                                                                                                                                                                                                                                                                     | 342 |
| Figure 55 – Relationship between total gear width (door spread) and vessel size by BENTHIS métier for Otter Trawl (OT). The shaded (grey) areas define Monte Carlo boot-strapped 95% confidence intervals .....                                                                                                                                                                                                                                                                                                                                                                                               | 343 |
| Figure 56 – Relationships between vessel length and various gear component dimensions for the three fisheries. Each graph includes the industry-survey based information (dots), the established relationship (line), and the 90% confidence interval (shading) for the vessel length values observed in the subsequent                                                                                                                                                                                                                                                                                       |     |

|                                                                                                                                                                                                                                                                                                                                                                                                                              |     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| analysis (dotted lines). Note that door weight was log-transformed in the plaice fisheries before establishing a relation with vessel length .....                                                                                                                                                                                                                                                                           | 344 |
| Figure 57 – Estimated relationship between catch and the three effort variables: door spread (M5.G, left column), haul duration (M3.HDn, middle column), and swept area (M4.SAn, right column). The dashed line indicates direct proportionality ( $y = x$ ). The x-axis has been rescaled to a mean value of 1.0 in all plots for easier comparison .....                                                                   | 345 |
| Figure 58 – Example of extreme threshold effects induced by the regulation on vessel length on the final LOA of the refit (left)/newly built (right) vessels. ....                                                                                                                                                                                                                                                           | 349 |
| Figure 59 – Predicted catch supplement per species (FAO code) if adding 1000 GT_days in a given COUNTRY_GEAR-GROUP combination. Based on 2023 catch and effort data in the NEA only, those data linked to the EU Fleet Register. A dark green cell marks zero-catch anticipated for this species and segment, while red cells marks a large catch is anticipated on a species per 1000 GT.days deployed into a segment ..... | 351 |
| Figure 60 – Predicted catch supplement if adding 1000 kW_days in a given COUNTRY_GEARGROUP combination. Based on 2023 catch and effort data in the NEA only, linked to the EU Fleet Register .....                                                                                                                                                                                                                           | 352 |
| Figure 61 – Catch rates (kg per day, all species pooled) over 2018-2023 years per fleet-segments in the NEA and split per Member State. Top: demersal segments, bottom: pelagic segments .....                                                                                                                                                                                                                               | 353 |
| Figure 62 – Concept for a new coastal fishing vessel .....                                                                                                                                                                                                                                                                                                                                                                   | 356 |
| Figure 63 – Details of 39.79 m factory trawler modification to install LNG propulsion system would lead to a 41.06 m refit vessel to accommodate for the larger fuel tank volume required for LNG .....                                                                                                                                                                                                                      | 357 |
| Figure 64 – Details of 10 m pot fishing vessel with electric propulsion .....                                                                                                                                                                                                                                                                                                                                                | 359 |
| Figure 65 – Details of 16.7 m trawler using LNG .....                                                                                                                                                                                                                                                                                                                                                                        | 359 |
| Figure 66 – Details of 10 m pot fishing vessel using methanol .....                                                                                                                                                                                                                                                                                                                                                          | 360 |
| Figure 67 – Details of 16.7 m trawler using methanol .....                                                                                                                                                                                                                                                                                                                                                                   | 360 |
| Figure 68 – Details of 24.5 m trawler using methanol .....                                                                                                                                                                                                                                                                                                                                                                   | 361 |
| Figure 69 – Example of a hydrogen-powered fishing vessel: PILOTHY project (Copraxma naval architect) .....                                                                                                                                                                                                                                                                                                                   | 361 |

## List of Abbreviations

| Term    | Description                                                       |
|---------|-------------------------------------------------------------------|
| AER     | Annual Economic Report                                            |
| AFA     | American Fisheries Act                                            |
| BAT     | Best Available Technique                                          |
| BSAI    | Bering Sea and Aleutian Islands                                   |
| CAP     | Common Agricultural Policy                                        |
| CDQ     | Community Development Quotas                                      |
| CFP     | Common Fisheries Policy                                           |
| CINEA   | European Climate, Infrastructure and Environment Executive Agency |
| CPUE    | Catch Per Unit Effort                                             |
| CR/BER  | Ratio between Current Revenue and the Break-Even Revenue          |
| DCF     | Data Collection Framework                                         |
| DG MARE | Directorate-General for Maritime Affairs and Fisheries            |
| DRB     | Boat dredge                                                       |
| DWFF    | Distant Water Fishing Fleet                                       |
| EAFM    | Ecosystem Approach to Fisheries Management                        |
| EASME   | Executive Agency for Small and Medium-sized Enterprises           |
| EEC     | European Economic Community                                       |
| EC      | European Commission                                               |
| EEZ     | Economic Exclusive Zone                                           |
| EFF     | European Fisheries Fund                                           |
| EMFF    | European Maritime Fisheries Fund                                  |
| EMFAF   | European Maritime Fisheries and Aquaculture Fund                  |
| EFJ     | Extended Fisheries Jurisdiction                                   |
| ELI     | Electronic Legislation Identifier                                 |
| ETP     | Energy Transition Partnership                                     |
| EU      | European Union                                                    |
| EWG     | Expert Working Group                                              |
| FAO     | Food and Agriculture Organization of the United Nations           |
| FDI     | Fisheries Dependent Information                                   |
| FIFG    | Financial Instrument for Fisheries Guidance                       |
| FPO     | Pots and traps                                                    |
| FUI     | Fuel Use Intensity                                                |
| GFCM    | General Fisheries Commission for the Mediterranean                |
| GHG     | Greenhouse Gas                                                    |
| GLM     | Generalised Linear Model                                          |
| GNS     | Set Gillnets                                                      |
| GSA     | Geographical Sub-Area                                             |
| GT      | Gross Tonnage                                                     |
| HCR     | Harvest Control Rule                                              |
| HVO     | Hydrotreated Vegetable Oil                                        |
| ICES    | International Council for the Exploration of the Sea              |
| IPOA    | International Plan of Action                                      |

| Term   | Description                                                                 |
|--------|-----------------------------------------------------------------------------|
| ITQ    | Individual Transferable Quota                                               |
| JRC    | Joint Research Centre                                                       |
| kW     | Kilowatt                                                                    |
| LLS    | Set longlines                                                               |
| LO     | Landing Obligation                                                          |
| LOA    | Length Overall                                                              |
| MAGP   | Multi-Annual Guidance Programme                                             |
| MBS    | Mediterranean and Black Seas                                                |
| MS     | Member State                                                                |
| MSA    | Magnuson Stevens Act                                                        |
| MSC    | Marine Stewardship Council                                                  |
| MSFD   | Marine Strategy Framework Directive                                         |
| MSY    | Maximum Sustainable Yield                                                   |
| NAFO   | North Atlantic Fisheries Organisation                                       |
| NAO    | North Atlantic Ocean                                                        |
| OECD   | Organisation for Economic Co-operation and Development                      |
| OTB    | Bottom otter trawl                                                          |
| OTM    | Midwater otter trawl                                                        |
| OTT    | Multi-rig otter trawl                                                       |
| PO     | Producer Organisation                                                       |
| PS     | Purse seine                                                                 |
| PTB    | Bottom pair trawl                                                           |
| PTM    | Midwater pair trawl                                                         |
| QMS    | Quota Management System                                                     |
| RBM    | Rights-based Management                                                     |
| RCG    | Regional Coordination Group                                                 |
| RDBFIS | Integrated Fisheries Information System for the Mediterranean and Black Sea |
| RoFTA  | Return on Fixed Tangible Assets                                             |
| RoI    | Return on Investment                                                        |
| RSW    | Refrigerated Sea Water tank                                                 |
| SAC    | Scientific Advisory Committee                                               |
| SAR    | Stocks-at-Risk                                                              |
| SDN    | Anchored seine                                                              |
| SHI    | Sustainable Harvest Indicator                                               |
| SoMFi  | The State of Mediterranean and Black Sea Fisheries                          |
| STCF   | Scientific and Technical Committee for Fisheries                            |
| STECF  | Scientific, Technical and Economic Committee for Fisheries                  |
| TAC    | Total Allowable Catch                                                       |
| TBB    | Beam trawl                                                                  |
| VME    | Vulnerable Marine Ecosystem                                                 |
| VMS    | Vessel Monitoring System                                                    |
| VUR    | Vessel Utilisation Ratio                                                    |
| WGFiT  | FAO Working Group on Fishing Technology                                     |
| WTO    | World Trade Organisation                                                    |

## Abstract

The European Union's (EU) fishing fleet has long-faced overcapacity, resulting in the overexploitation of fish stocks. The 2009 Green Paper on the Common Fisheries Policy (CFP) highlighted this challenge, and reforms in 2013 promoted sustainable fisheries, healthier stocks, and a reduced fleet size. Although EU fleets now generally meet capacity limits, sustainability and sector viability remain a risk. This study analyses EU fleet imbalances from 2015 to 2023, identifies vulnerable segments, and explores causes of overcapacity. Five European case studies, including stakeholder consultation, show that existing capacity limits may not fully ensure alignment between fleet size and available resources. Achieving a balanced fleet is a precondition for vessel modernisation and energy transition. Future challenges, such as adopting lower CO<sub>2</sub>-emitting engines and attracting young fishers, may not require additional capacity, especially if national capacity ceilings are not yet met. However, future policies may affect the profitability of active fleets. EU policy must ensure that renewal and modernisation efforts do not lead to overcapacity or increased pressure on fish stocks, as per CFP. A review of the best international practices in fleet capacity management was also undertaken to help identify applicable solutions for the EU. The goal was to review international practices that would tackle ongoing challenges without increasing overcapacity or imbalance. Finally, and based on the main findings, the study provides recommendations to inform the EU fleets future development.



## Executive Summary [EN]

The main objective of this research study is to describe the evolution of the European Union's fleet, identify present and future challenges and explain how these challenges impact the fleet's sustainability, as well as provide insights on how to address these challenges.

The need to optimise and manage effectively fishing capacity is a recurring theme in CFP reforms. Since the last 2013 CFP reform, the EU fishing fleet has evolved, with its nominal capacity decreased. However, yearly reports of Member States show that, for some fleet segments, imbalances remain where weak economic performance is coupled with a poor state of fish resources.

**Today, the EU's fishing fleet faces many challenges.** Climate change, biodiversity loss and marine pollution are reducing the productivity of marine ecosystems and fish stocks, which in turn threatens the fleet's economic sustainability. At the same time, the sector must accelerate the **energy transition** and **modernise vessels**, including improving onboard conditions to attract new entrants and support generational renewal of the workforce.

In recent years, fishing industry stakeholders have criticised that the fleet capacity ceilings hinder growth, innovation, safety, and renewal of an ageing fleet. As stipulated in the 2013 amendment to the CFP Regulation, where the fishing fleet capacity of the Member States is controlled by ceilings and an entry/exit scheme (Article 23, 2013 CFP), a new vessel can only enter a fleet after the equivalent fishing capacity (in kW and GT) is removed from the same fleet. Besides, EMFAF funds only allow increasing the GT of a particular vessel (< 24 m) to improve safety, working conditions or energy efficiency, and only if this vessel belongs to a segment for which the fishing capacity is in balance with the fishing opportunities available.

Despite a reduction in absolute value in the metrics used to define fishing fleet capacity, resulting from various public scrapping programs and voluntary exit, **numerous cases of imbalance between fleet and fishing opportunities have been reported from 2014 to the present.** Hence, the observed decrease in EU fishing fleet capacity (by means of total kW and GT) did not translate into an overall balanced capacity with the available fishing opportunities. Because imbalance was widespread, this contributes to **a gap between actual GT and GT ceilings observed for all EU Member States.** Consequently, all 22 coastal Member States have shown an annual decrease in both their GT and kW since the year 2000.

To better understand the reasons why imbalance occurs within various EU fleet segments and what the main drivers are behind the observed trends, five case studies were developed from different sea basins. As demonstrated in these case studies, there is no guarantee that the current limitations on fishing capacity are



sufficient to ensure the fleets are balanced with the available resources. Despite some progress, EU indicators show that many fleet segments remain imbalanced, which climate change, and other environmental factors external to fishing, may further exacerbate due to inflexible capacity and quota reallocation. Reaching a better balance between fleet capacity and fishing opportunities would not only ensure the fishing industry is eligible for public aid, but also enable vessel modernisation without public aid.

The **main drivers for imbalance** mentioned by stakeholders in case studies are:

- Western Mediterranean: The deterioration of key economic indicators was closely linked to a significant increase in operating costs and negatively impacted fleets. Slow stock improvement has been observed, and the main stocks of commercial interest, such as hake, remain below target biomass. Consideration of economic and social aspects when assessing reasons for fleet imbalance is perceived as lacking, while a weak or a lack of generational change in the fishing workforce is an issue.
- EU Atlantic Western Waters: Recurrent imbalances in the biological and economic indicators of certain segments of the fleet were related to the state of key resources, necessitating the implementation of Action Plans. The economic performance of the region's fishing fleets was also affected by the Covid-19 pandemic, particularly those specialising in the fresh fish market. There is a lack of socio-economic studies on market conditions. The social impact of market conditions on the economic performance of these fleets would need to be analysed further.
- Baltic Sea: Resource availability and fish stock fluctuations impacted the economic viability of the fleet. At the same time, factors external to fishing, such as price variations, affected profitability and fleet sustainability. Environmental changes, such as climate shifts and habitat degradation, impacted fish distribution.
- Greater North Sea: Quota dynamics, particularly the role of choke species like cod and Norway lobster in mixed fisheries, emerged as critical drivers of imbalance. Limited application of quota exchange between Member States so far has not helped rebalance capacity. Methodological challenges persist in socio-economic indicators, including data fragmentation and inconsistent reporting standards, which hinders comprehensive analysis.
- EU External waters: The lack of sufficient quota and the mismatch between capacity and quota availability, or the ability to swap quotas, were the most significant sources of fleet imbalance. Taxation has also discouraged taking part in the scrapping program, with a labour shortage also mentioned as a possible source of some fleet inactivity.

Considerable efforts have been made to address the problem of overcapacity outside the EU, and a variety of mechanisms have been put in place to reduce the incentives to accumulate capacity or to provide the means to reduce it. **The study provides an overview of international experience in the management of fishing fleet capacity** for a select group of countries with large fishing fleets, which can help distil several lessons that could be useful in the EU context, thus:

- Iceland: Like for Iceland's initial experience with decommissioning schemes, the successive EU structural fisheries funds have allowed permanent cessation of redundant fleet capacity. Also, like Iceland, rights-based management in the EU imposes restrictions that range from partial to full restrictions on transferability to prevent market concentration. Despite these restrictions, ITQs in the EU have led to a degree of concentration of fishing rights and fleet reduction in some EU fleets.
- South Africa: A system of fishing days based on engine power and quotas has been implemented, following an active participatory process with industry to address capacity issues. It should be noted that similar initiatives could be implemented in the EU, and the ad hoc technical working groups of the Advisory Councils are well placed to act as participatory platforms.
- New Zealand: Non-professional fishers can acquire fishing rights on the market and speculate with them. Applied to the EU, this would affect the social fabric of the fisheries sector, as quota holders would benefit from the exploitation of a resource without carrying out any fishing activity themselves. This would fail to preserve intangible assets, such as traditional fishing practices and values, as well as maintaining employment levels in fishing and related activities within fishing communities.
- The Bering Sea pollock fishery: The sector was allowed to form cooperative quotas, enabling fishers to cooperate and contribute to management through a degree of co-management. The study found that the EU management system is even more flexible by allowing exchanges between sectors, with POs able to pool members' quotas and request governments to negotiate quota swaps between countries. At the Member State level, POs can also exchange quotas with other POs.
- China: China's approach to fleet management differs from that of the EU in the predominance of input management measures, which require a robust enforcement system. China, like for EU Member States, compensates fishers for the temporary cessation of fishing activity, using public funds, and both have also used public resources to remove excess fleet capacity. China is also used to reassign idle fishing labour from scrapped vessels to other activities in the fisheries value chain.

- Norway: There are some parallels between Norway and the EU, such as the shared aim of eliminating redundant capacity and the increased use of rights-based management. Norway no longer has fully-funded decommissioning schemes or rights of permanent duration.
- UK: Individual quota allocations only apply to vessels belonging to a PO. The UK innovated virtual entitlements, or “dummy licenses”, that enable licenses to remain in the system after a vessel has been scrapped, for use with newly built vessels or to facilitate the entry of larger, modernised vessels. Adopting these kinds of systems in the EU (some countries already use virtual licences, but they are subject to a number of conditions) would allow owners to trade licences and quotas with other vessel owners for fishing purposes, or to adapt their fishing vessels for environmental protection and crew habitability.

**The CFP allows new fishing vessels to be built with private money, along with safeguards to prevent the fleet's total fishing capacity from increasing.**

In managing the EU fishing fleet and addressing overcapacity, alternatives to the current CFP proxies (i.e. kW and GT) for measuring “fishing capacity” the study explored alternatives to determine whether complementary metrics better capture the link to “harvesting capacity” (defined as “the ability to catch fish”) and address other challenges (such as vessel modernisation). These include:

- Safety tonnage: Increases in GT capacity ceilings to improve safety onboard, working conditions, or product quality under certain conditions can have counterproductive effects. In Spain, for example around the year 2000, several incidents involved vessels that had benefited from safety tonnage allowances. Giving extra capacity to individual vessels can thus come with unintended adverse effects. For example, the safety at sea and working conditions may be compromised due to the calculation method used for the GT or the categorisation of the LOAs.
- Net tonnage: Some stakeholders claim that net tonnage (NT) may be a better indicator of actual fishing capacity or fish storage space. Still, the study found that the NT declaration is poorly suited to fishing vessels and therefore makes the NT information inaccurate for fishing vessels.
- Potential fishing capacity: Evaluating the “hypothetical maximum annual catch” will require evaluating the feasibility of splitting GT into different categories. These categories could include GT\_safety (e.g., additional deck space), GT\_energy\_transition (e.g., space for battery storage or installing a bulbous bow or inverted bow), GT\_wellbeing (e.g., more accommodation on board for the comfort of the crew), and a GT\_harvesting\_cap (i.e. harvesting capacity). Implementing these distinctions would also require the development of clear, harmonised definitions and protocols for marine surveyors to assess and verify these GT components. In the long-term, the study concluded that the fishing

capacity should also be revised to track and account for technological advances that improve harvesting capacity over time.

The study also documented the strength of the link between fishing capacity and harvesting capacity, as well as the impact of quota regimes, effort regimes, and mixed fisheries situations. In managing the EU fleet, it is found that the situation in the Northeast Atlantic and the Mediterranean and Black Sea regions differ significantly. This is due to the different dominant fisheries management regimes in place (i.e. output controls in the Northeast Atlantic vs. input controls in the Mediterranean and Black Sea).

There are **multiple technological solutions** to improve energy efficiency, to use alternative fuels for vessel propulsion, and to reduce the carbon footprint of the fishing fleet. The study found that, contrary to shifting to new fuel types, short-term solutions for lowering fossil fuel consumption in fisheries do not typically involve more GT/kW. Minimising energy use - with solutions for more energy efficiency - before shifting over to alternative fuels will also help to minimise the possible need for increased storage space for fuel.

An overarching challenge for the EU fleet policy is to provide more flexibility in fleet renewal policies to allow modernisation without permanently reducing or increasing its capacity. **Fleet policy must ensure that fleet renewal and modernisation, which may require additional capacity, does not result in an improved ability to catch fish, leading to further fleet imbalance and overcapacity, or putting more pressure on exploited stocks.** It is not clear, however, if extra capacity is required at all, given that the actual active capacity is well below the country-specific capacity ceilings for most EU countries. A set of proposed measures and recommendations to address and reallocate fishing capacity across fleet segments effectively, which are further expanded on in Section 8, include:

**Recommendation 1 – Conduct Member State and segment-specific studies to evaluate the need for additional capacity.** The study suggests examining whether current ceilings can accommodate the necessary changes or would be exceeded, without resulting in increased out-of-balance situations.

**Recommendation 2 – Distinguish vessel volume unrelated to harvesting capacity,** including decomposing the vessel volume into subcomponents that address different functional purposes, such as a safety GT, an energy transition GT, an ability-to-fish-related GT, and a wellbeing GT, and continue controlling and monitoring vessel volumes and engine power.

**Recommendation 3 – Explore the redistribution of fishing capacity,** and develop the adapted governance for it, as well as considering market-based fleet management, e.g. individual quotas, licence detached from the vessel, possibilities for quota swaps and quota pools, local market development, promote governance for better catch valuation, transitioning from high to low-impact fishing gears, evaluate transition costs and feasibility.

**Recommendation 4 – Continue EU fleet management in support of fisheries management objectives**, by increasing vessel efficiency, while continuing to implement catch and effort limits, removing barriers that prevent full quota uptake, and ensuring sustainable fishing as a prerequisite for funding eligibility.

**Recommendation 5 – Control unintended side effects of effort-based management and complement with catch limits.** Limit the ability to catch fish through close monitoring and effective control of fishing effort. This includes restricting the number of allowable fishing days, addressing unintended side effects associated with management systems based solely on effort controls, and continuing to investigate ways to reduce incentives for oversized kW engines.

**Recommendation 6 – Work toward reducing uncertainty in catch advice**, and revise EC 2014 guidelines for evaluating EU fleet balance that better link to the risk of overcapacity. This includes fishing with more caution below the  $F_{MSY}$  and modifying the “balance” indicators to capture drivers of overcapacity.

A core challenge for fleet management aimed at controlling fishing capacity is how to accommodate efficiency improvements that are often essential for the economic viability of certain fleet segments. Therefore, the study concludes that fleet management should not seek to constrain efficiency at the level of individual vessel, but rather to manage fleet-level efficiency so as to **maintain a sustainable balance with fisheries opportunities**. This is a prerequisite for a successful EU fleet renewal, alongside an energy transition toward low-carbon low-impact fisheries.

\*\*\*

## Résumé exécutif [FR]

Le principal objectif de cette étude de recherche est de décrire l'évolution de la flotte de pêche de l'Union européenne, d'identifier les défis présents et futurs, et d'expliquer comment ces défis affectent la durabilité de la flotte, tout en fournissant des pistes pour y faire face. La nécessité d'optimiser la capacité de pêche et de la gérer efficacement constitue un thème récurrent dans les réformes de la PCP. Depuis la dernière réforme de la PCP en 2013, la flotte de pêche de l'UE a évolué, sa capacité nominale ayant diminué. Cependant, les rapports annuels des États membres montrent que, pour certains segments de la flotte, des déséquilibres subsistent, où une faible performance économique est associée à un état médiocre des ressources halieutiques.

Aujourd'hui, la flotte de pêche de l'UE fait face à de nombreux défis. Le changement climatique, l'érosion de la biodiversité, et la pollution marine réduisent la productivité des écosystèmes marins et des stocks de poissons, ce qui menace la viabilité économique de la flotte. En même temps, le secteur doit accélérer la transition énergétique et moderniser les navires, notamment en améliorant les conditions à bord afin d'attirer de nouveaux entrants et de soutenir le renouvellement de la main-d'œuvre.

Ces dernières années, les parties prenantes de l'industrie de la pêche ont critiqué le fait que les plafonds de capacité de la flotte freinent la croissance, l'innovation, la sécurité et le renouvellement d'une flotte vieillissante. Selon l'amendement de 2013 au règlement du PCP, lorsque la capacité de pêche des États membres est contrôlée par des plafonds de capacité de pêche et un dispositif d'entréesortie (article 23 du PCP 2013), un nouveau navire ne peut intégrer la flotte qu'après que la capacité de pêche équivalente (en kW et en jauge brute, GT) ait été retirée de la même flotte. D'un autre côté les fonds FEAMPA n'autorisent l'augmentation de la GT d'un navire (de moins de 24 mètres) seulement si le but est d'améliorer la sécurité, les conditions de travail ou son efficacité énergétique, et si ce navire appartient à un segment évalué en équilibre avec la ressource disponible qu'il cible. Malgré une réduction en valeur absolue des indicateurs utilisés pour définir la capacité de la flotte de pêche à la suite des plans de sortie de flottes qui se sont succédé, **de nombreux cas de déséquilibre entre la flotte et les opportunités de pêche ont été signalés de 2014 à aujourd'hui**. Ainsi, la diminution observée de la capacité de la flotte de pêche de l'UE (mesurée en kW et en GT totaux) ne s'est pas traduite par une capacité globale équilibrée avec les opportunités de pêche disponibles. Les situations de déséquilibres persistantes ont donc contribué à créer un **écart entre le GT réel et les plafonds de GT observés pour tous les États membres de l'UE**. En conséquence, les 22 États membres côtiers ont enregistré chaque année une diminution tant de leur GT que de leurs kW depuis l'an 2000.



Pour mieux comprendre les raisons pour lesquelles le déséquilibre apparaît dans les différents segments de la flotte de l'UE et identifier les principales causes des tendances observées, cinq études de cas ont été réalisées à partir de bassins marins distincts. Comme le montrent ces études de cas, il n'y a aucune garantie que les limites actuelles de la capacité de pêche soient suffisantes pour assurer un équilibre entre les flottes et les ressources disponibles. Malgré quelques progrès, les indicateurs de l'UE révèlent que de nombreux segments de flotte restent déséquilibrés, un déséquilibre qui pourrait être aggravé par le changement climatique et d'autres facteurs environnementaux externes à la pêche, ou en raison d'une inflexibilité dans la réallocation des quotas. Atteindre un meilleur équilibre entre la capacité de la flotte et les opportunités de pêche permettrait non seulement à l'industrie de la pêche d'être éligible aux aides publiques, mais aussi de moderniser les navires sans recourir à ces aides.

**Principaux facteurs à l'origine du déséquilibre** évoqués par les parties prenantes dans les études de cas :

- **Méditerranée occidentale** : la détérioration des indicateurs économiques clés était étroitement liée à une hausse importante des coûts d'exploitation, ce qui a eu un impact négatif sur les flottes. On constate une lente amélioration des stocks, et les principales espèces d'intérêt commercial, comme le merlu, restent en dessous de la biomasse cible. L'aspect économique et social est jugé insuffisamment pris en compte lors de l'évaluation des raisons du déséquilibre de la flotte, tandis qu'une faiblesse ou une absence de renouvellement générationnel dans la main-d'œuvre de la pêche constitue également un problème.
- **Eaux atlantiques occidentales de l'UE** : Des déséquilibres récurrents dans les indicateurs biologiques et économiques de certains segments de la flotte étaient liés à l'état des ressources clés, ce qui a nécessité la mise en œuvre de plans d'action. La performance économique des flottes de pêche de la région a été affectée par la pandémie du Covid19, en particulier celles spécialisées dans le marché du poisson frais, que les parties prenantes ont identifié comme une cause de déséquilibre. Il manque des études socioéconomiques sur les conditions du marché, et l'impact social de ces conditions sur la performance économique de ces flottes doit être analysé plus en profondeur.
- **Mer Baltique** : la disponibilité des ressources et les fluctuations des stocks de poissons ont influencé la viabilité économique de la flotte. Parallèlement, des facteurs extérieurs à la pêche, tels que les variations de prix, ont affecté la rentabilité et la durabilité de la flotte. Les changements environnementaux, comme le dérèglement climatique et la dégradation des habitats, ont modifié la répartition des poissons.
- **Mer du Nord** : la dynamique des quotas, en particulier le rôle des espèces limitantes (« choke species ») comme le cabillaud et la langoustine dans

les pêcheries mixtes, apparaît comme un facteur clé du déséquilibre. Les échanges limités de quotas entre les États membres n'a pas encore permis de rétablir un équilibre de capacité. Des difficultés méthodologiques persistent concernant les indicateurs socioéconomiques, notamment la fragmentation des données, et des incohérences dans les normes de déclaration entravent une analyse complète.

- **Eaux extérieures de l'UE :** Le décalage entre la capacité et la disponibilité des quotas, ainsi que la difficulté à échanger des quotas, constituent les principales sources de déséquilibre de la flotte. Le régime fiscal décourage également la participation au programme de mise hors service des navires, et la pénurie de main-d'œuvre a également été évoquée comme une cause possible d'inactivité de certaines parties de la flotte.

Hors de l'UE, des efforts considérables ont été déployés pour résoudre le problème de la surcapacité, et divers mécanismes ont été mis en place afin de réduire les incitations à accumuler de la capacité de pêche ou de fournir les moyens d'en diminuer. **L'étude propose un aperçu de l'expérience internationale en matière de gestion de la capacité des flottes de pêche** dans les pays disposant de grandes flottes, ce qui permet d'en extraire plusieurs enseignements susceptibles d'être utiles dans le contexte de l'UE, à savoir :

- **Islande :** à l'instar de l'expérience initiale de l'Islande avec les programmes de mise hors service, les fonds structurels européens successifs ont permis la cessation permanente des capacités de flotte redondantes. De même que pour l'Islande, la gestion fondée sur les droits dans l'UE impose des restrictions, allant de mesures partielles à des interdictions totales de transférabilité, afin d'éviter la concentration du marché. Malgré ces restrictions, les quotas individuels transférables (ITQ) dans l'UE ont entraîné une certaine concentration des droits de pêche et une réduction de la flotte dans certaines flottes européennes.
- **Afrique du Sud :** un système de journées de pêche basé sur la puissance des moteurs et les quotas a été mis en place, à la suite d'un processus participatif actif avec les pêcheurs pour traiter les problèmes de capacité. Il convient de noter que des initiatives similaires pourraient être déployées dans l'UE, et que les groupes de travail techniques ad hoc des Conseils consultatifs sont bien placés pour servir de plateformes participatives.
- **Nouvelle-Zélande :** les non professionnels peuvent acquérir des droits de pêche sur le marché et les spéculer. Si ce modèle était appliqué à l'UE, il impacterait le tissu social du secteur de la pêche, car les détenteurs de quotas bénéficieraient de l'exploitation d'une ressource sans exercer eux-mêmes d'activité de pêche. Cela compromettrait la préservation d'actifs immatériels tels que les pratiques et valeurs de pêche



traditionnelles, ainsi que le maintien des niveaux d'emploi dans la pêche et les activités connexes au sein des communautés de pêcheurs.

- **Pêche du merlu de la mer de Béring** : le secteur a pu créer des quotas coopératifs, permettant aux pêcheurs de collaborer et de contribuer à la gestion grâce à une forme de cogestion. L'étude a constaté que le système de gestion de l'UE est encore plus souple, puisqu'il autorise les échanges entre secteurs, les organisations de pêcheurs (OP) pouvant regrouper les quotas de leurs membres et demander aux gouvernements de négocier des échanges de quotas entre pays. Au niveau des États membres, les OP peuvent également échanger des quotas avec d'autres OP.
- **Chine** : l'approche chinoise de la gestion des flottes diffère de celle de l'UE par la prédominance des mesures de gestion axées sur l'effort de pêche (« input control »), qui nécessitent un système de contrôle rigoureux. La Chine, à l'instar des États membres de l'UE, indemnise les pêcheurs pour l'arrêt temporaire de l'activité de pêche en utilisant des fonds publics, et les deux ont également mobilisé des ressources publiques pour éliminer la capacité excédentaire des flottes. En outre, la Chine réaffecte la main-d'œuvre de pêche inoccupée provenant de navires mis hors service vers d'autres activités de la chaîne de valeur de la pêche.
- **Norvège** : il existe certains parallèles entre la Norvège et l'UE, comme l'objectif commun d'éliminer la capacité redondante et le recours accru à la gestion fondée sur les droits de pêche (« right-based management »). La Norvège ne dispose plus de programmes de mise hors service entièrement financés ni de droits de durée permanente.
- **RoyaumeUni** : les allocations de quotas individuelles ne concernent que les navires appartenant à une organisation de pêcheurs (OP). Le RoyaumeUni a introduit les « droits virtuels », ou « licences factices », qui permettent aux licences de rester actives dans le système après la mise hors service d'un navire, afin de les réattribuer à des navires neufs ou de faciliter l'entrée de navires plus grands et modernisés. L'adoption de ce type de dispositif dans l'UE (certains pays utilisent déjà des licences virtuelles, sous certaines conditions) permettrait aux propriétaires d'échanger licences et quotas avec d'autres propriétaires de navires à des fins de pêche, ou d'adapter leurs bateaux de pêche à la protection de l'environnement et à l'amélioration de l'habitabilité pour l'équipage.

La PCP autorise la construction de nouveaux navires de pêche avec des fonds privés, tout en prévoyant des garde-fous pour empêcher l'augmentation de la capacité totale de pêche de la flotte. Dans la gestion de la flotte de pêche de l'UE et la lutte contre la surcapacité, l'étude a envisagé des alternatives aux proxies actuels de la PCP (c'est-à-dire les kW et la jauge brute) pour mesurer la « capacité de pêche ». Cela permettrait de déterminer si des métriques complémentaires

saisissent mieux le lien avec l' « efficacité de pêche » (définie comme l'habilité à capturer un certain volume de capture) et répondent à d'autres enjeux (comme la modernisation des navires). Parmi ces alternatives, on trouve :

- **« Jauge de sécurité en mer »** : si les plafonds de capacité en GT étaient augmentés pour améliorer la sécurité à bord et en mer, les conditions de travail ou la qualité du produit dans certaines circonstances, cela a eu l'effet inverse : par exemple, autour de l'an 2000, plusieurs accidents se sont produits en Espagne avec des navires qui avaient bénéficié d'ajouts de GT destinée à une sécurité renforcée. Ainsi, accorder une capacité supplémentaire à des navires individuels peut entraîner des effets indésirables. Par exemple, la sécurité en mer et les conditions de travail peuvent être compromises en raison de la méthode de calcul utilisée pour le GT ou de la catégorisation de la longueur hors tout (LOA).
- **Jauge nette (NT)** : certains acteurs estiment que la jauge nette pourrait être un indicateur plus pertinent de la capacité réelle de pêche ou de l'espace de stockage du poisson. Toutefois, l'étude a conclu que la déclaration de la NT ne correspond pas aux navires de pêche, rendant ainsi les informations relatives à la NT inexactes pour ces embarcations.
- **Capacité de pêche potentielle** : évaluer le « captage annuel maximal hypothétique » implique de pouvoir scinder la jauge brute (GT) en différentes catégories. Ces catégories pourraient inclure : (**GT\_sécurité**) l'espace supplémentaire sur le pont, destiné à améliorer la sécurité à bord ; (**GT\_transition\_énergétique**) l'espace réservé au stockage de batteries ou à l'installation d'une proue bulbeuse ou inversée, facilitant la transition énergétique ; (**GT\_bien-être**) avec davantage d'hébergement à bord pour le confort de l'équipage ; (**GT\_capacité\_d\_extraction**) : capacité proprement dite d'attraper un certain volume de capture. La mise en œuvre de ces distinctions nécessiterait également l'élaboration de définitions claires et harmonisées ainsi que de protocoles destinés aux experts du secteur pour évaluer et vérifier ces composantes de la GT. À long terme, l'étude conclut que la notion de capacité de pêche devrait être révisée afin de suivre et prendre en compte les avancées technologiques qui améliorent la capacité d'extraction au fil du temps.

L'étude a également mis en évidence la forte corrélation entre la capacité de pêche et la capacité d'extraction, ainsi que l'impact des quotas de capture et d'effort de pêche, et de la situation des pêcheries mixtes. Dans la gestion de la flotte de l'UE, il apparaît que la situation dans l'Atlantique NordEst diffère nettement de celle des régions Méditerranée et Mer Noire. Cette divergence s'explique par le type de gestion des pêches dominants dans chaque zone : contrôles de production (output) dans l'Atlantique NordEst contre contrôles d'effort (input) en Méditerranée et dans la mer Noire.

Il existe **plusieurs solutions technologiques** pour améliorer l'efficacité énergétique, utiliser des carburants alternatifs pour la propulsion des navires et réduire l'empreinte carbone de la flotte de pêche. L'étude a montré que, contrairement à un passage systématique à de nouveaux types de carburant, les solutions à court terme visant à diminuer la consommation de combustibles fossiles dans la pêche n'impliquent généralement pas une augmentation de la jauge brute (GT) ou de la puissance (kW). Réduire la consommation d'énergie, grâce à des solutions d'efficacité énergétique, avant de passer aux carburants alternatifs contribuera également à limiter le besoin éventuel d'augmenter l'espace de stockage du carburant.

Un défi transversal de la politique de la gestion de la flotte de pêche de l'UE consiste à offrir davantage de flexibilité dans les politiques de renouvellement afin de permettre la modernisation sans réduire ou augmenter définitivement la capacité de la flotte. **La politique de la flotte doit veiller à ce que le renouvellement et la modernisation, qui peuvent nécessiter une capacité supplémentaire, n'entraînent pas une meilleure capacité de capture, ce qui aggraverait le déséquilibre et la surcapacité, ni ne mette davantage de pression sur les stocks exploités.** Cependant, il n'est pas clair que cette capacité supplémentaire requiert de réviser les plafonds à l'échelle de l'UE, étant donné que la capacité active réelle se situe largement en dessous des plafonds de capacité propres à chaque pays pour la plupart des États membres de l'UE. Les résultats de l'étude conduisent à proposer des mesures et des recommandations, détaillées plus avant au chapitre 8, visant à redistribuer efficacement la capacité de pêche parmi les différents segments de flotte, en particulier :

**Recommandation 1 – Mener des études spécifiques par État membre et par segment afin d'évaluer le besoin de capacité supplémentaire**  
L'étude suggère d'analyser en profondeur si les plafonds actuels peuvent accueillir les changements requis ou s'ils seraient dépassés, sans entraîner une aggravation des déséquilibres.

**Recommandation 2 – Distinguer le volume du navire qui n'est pas lié à la capacité de récolte**  
Cela implique de décomposer le volume du navire en souscomposantes correspondant à des fonctions différentes, telles que : une jauge brute de sécurité (GT sécurité), une jauge brute de transition énergétique (GT transition énergétique), une jauge brute liée à la capacité de pêche (GT capacité d'extraction) et une jauge brute de bien-être (GT bien-être), tout en continuant à contrôler et à surveiller les volumes des navires et la puissance des moteurs.

**Recommandation 3 – Explorer la possibilité de redistribution de la capacité de pêche** et développer une gouvernance adaptée à cet effet, ainsi que considérer une gestion de la flotte basée sur le marché (par ex. quotas individuels, licences détachées du navire, possibilités d'échanges de quotas et

de pools de quotas, développement de marchés locaux, promotion d'une gouvernance favorisant une meilleure valorisation des captures, transition des engins de pêche à fort impact vers des engins à faible impact, évaluation des coûts de transition et de leur faisabilité).

**Recommandation 4 – Connaître les opportunités et les défis de la gestion des pêches** en poursuivant la mise en œuvre de limites de captures, en augmentant l'efficacité des navires, en supprimant les obstacles qui empêchent l'utilisation complète des quotas, et en garantissant une pêche durable comme condition préalable à l'éligibilité aux financements.

**Recommandation 5 – Poursuivre la gestion de la flotte de l'UE pour soutenir la gestion des pêches** Continuer à limiter la capacité de capture grâce à un suivi rapproché de l'effort de pêche, en restreignant le nombre de jours autorisés, en contrôlant les effets secondaires imprévus d'une gestion uniquement basée sur le régime d'effort, et en poursuivant les recherches visant à réduire la préférence pour les moteurs surdimensionnés (kW élevés).

**Recommandation 6 – Travailler à réduire l'incertitude des conseils de capture** et réviser les lignes directrices de la CE de 2014 relatives à l'évaluation de l'équilibre de la flotte de l'UE afin d'établir un meilleur lien avec le risque de surcapacité. Cela comprend l'adoption d'une approche de précaution en dessous du FMSY (production maximale durable) et la modification des indicateurs « d'équilibre » (« balance indicators ») pour mieux refléter les facteurs à l'origine de la surcapacité.

Un défi central de la gestion d'une flotte lorsqu'il s'agit de maîtriser la capacité de pêche réside dans le fait que les améliorations d'efficacité sont souvent indispensables pour renforcer la viabilité économique de certains segments de flotte. Ainsi, l'étude conclue que l'objectif de la gestion de la flotte ne doit pas consister à contraindre l'efficacité individuelle des navires, mais plutôt à gérer la flotte de telle sorte à **garantir un équilibre durable avec les opportunités de pêche**, condition indispensable à un renouvellement réussi de la flotte de l'UE, tout en menant la transition énergétique vers des pêcheries à faible empreinte carbone et à faible impact.

\*\*\*

## Zusammenfassung [DE]

Das Hauptziel dieses Forschungsberichts besteht darin, die Entwicklung der derzeitigen Flotte der Europäischen Union zu beschreiben, aktuelle und zukünftige Herausforderungen für die Flottenpolitik zu identifizieren und zu erläutern, wie sich diese Herausforderungen auf die Nachhaltigkeit der Flotte auswirken. Zusätzlich sollen Einblicke gegeben werden, wie diese Herausforderungen bewältigt werden können.

Die Notwendigkeit, die Fangkapazitäten zu optimieren bzw. effektiv zu managen und effektiv zu verwalten, ist ein wiederkehrendes Thema bei den Reformen der GFP. Seit der letzten GFP-Reform im Jahr 2013 hat sich die Fischereiflotte der EU weiterentwickelt, wobei ihre nominale Kapazität zurückgegangen ist. Die Jahresberichte der Mitgliedstaaten zeigen jedoch, dass in einigen Flottensegmenten weiterhin Ungleichgewichte bestehen, wo eine schwache Wirtschaftsleistung mit einem schlechten Zustand der Fischbestände einhergeht.

**Die Fischereiflotte der EU steht heute vor vielen Herausforderungen.** Der Klimawandel und die Meeresverschmutzung verringern die Produktivität der Meeresökosysteme und Fischbestände, was wiederum die wirtschaftliche Nachhaltigkeit der Flotte gefährdet. Gleichzeitig muss der Sektor die **Energiewende** beschleunigen und die **Schiffe modernisieren**, einschließlich der Verbesserung der Bedingungen an Bord, um neue Arbeitskräfte anzuziehen und den Generationswechsel in der Belegschaft zu unterstützen.

In den letzten Jahren haben Interessenvertreter der Fischereiindustrie kritisiert, dass die Obergrenzen für die Flottenkapazität Wachstum, Innovation, Sicherheit und die Erneuerung einer alternden Flotte behindern. Gemäß der Änderung der GFP-Verordnung von 2013, wonach die Fischereiflottenkapazität der Mitgliedstaaten durch Obergrenzen und eine Zugangs-/Abgangsregelung (Artikel 23, GFP 2013) kontrolliert wird, kann ein neues Schiff nur dann in eine Flotte hineinkommen, wenn die entsprechende Fangkapazität (in kW und BRZ) aus derselben Flotte ausscheidet. Eine Ausnahme gibt es nur, wenn ein Antrag auf EMFAF-Mittel zur Verbesserung der Sicherheit, der Arbeitsbedingungen oder der Energieeffizienz gestellt wird. Dies gilt aber nur, wenn das Fahrzeug zu einem Segment gehört, für das die Fangkapazität im Gleichgewicht mit den vorhandenen Fangmöglichkeiten ist.

Dies trägt zu einer **Lücke zwischen den tatsächlichen BRZ und den für alle EU-Mitgliedstaaten festgelegten BRZ-Obergrenzen bei**. Infolgedessen verzeichnen alle 22 Küstenmitgliedstaaten seit dem Jahr 2000 einen jährlichen Rückgang sowohl ihrer BRZ als auch ihrer kW.

Trotz dieses Rückgangs der absoluten Werte in den zur Definition der Fischereiflottenkapazität verwendeten Kennzahlen, **wurden seit 2000 bis heute zahlreiche Fälle von Ungleichgewichten zwischen Flotte und**

**Fangmöglichkeiten gemeldet.** Die neuesten Gleichgewichtsindikatoren, die 2024 berechnet wurden, zeigen, dass es in der EU 619 aktive Flottensegmente mit 52 820 Schiffen gab. Daher führte der beobachtete Rückgang der Kapazität der EU-Fischereiflotte (gemessen in Gesamt-kW und BRZ) nicht zu einer insgesamt ausgewogenen Kapazität im Verhältnis zu den verfügbaren Fangmöglichkeiten.

Um besser zu verstehen, warum es in verschiedenen Segmenten der EU-Flotte zu Ungleichgewichten kommt und was die Hauptursachen für die beobachteten Trends sind, wurden fünf Fallstudien aus verschiedenen Ozeanbecken ausgewählt. Wie diese Fallstudien zeigen, gibt es keine Garantie dafür, dass die derzeitigen Beschränkungen der Fangkapazitäten ausreichen, um ein Gleichgewicht zwischen den Flotten und den verfügbaren Ressourcen zu gewährleisten. Trotz einiger Fortschritte zeigen die EU-Indikatoren, dass viele Flottensegmente nach wie vor unausgewogen sind, was durch den Klimawandel und andere umweltbezogene Faktoren außerhalb der Fischerei aufgrund unflexibler Kapazitäten und Umverteilung von Quoten noch verschärft werden könnte. Ein besseres Gleichgewicht zwischen Flottenkapazität und Fangmöglichkeiten würde nicht nur sicherstellen, dass die Fischereiindustrie Anspruch auf öffentliche Beihilfen hat, sondern auch die Modernisierung von Schiffen ohne öffentliche Beihilfen ermöglichen.

Die wichtigsten Treiber für Ungleichgewicht, die Interessenvertreter in den Fallstudien genannt haben, sind:

- Westliches Mittelmeer: Die Verschlechterung wichtiger Wirtschaftsindikatoren stand in engem Zusammenhang mit einem erheblichen Anstieg der Betriebskosten und wirkte sich negativ auf die Flotten aus. Es wurde eine langsame Verbesserung der Bestandshöhen beobachtet, aber die wichtigsten kommerziell interessanten Bestände, wie beispielsweise Seehecht, liegen noch unter der Zielbiomasse. Bei der Bewertung der Gründe für das Ungleichgewicht der Flotten werden wirtschaftliche und soziale Aspekte offenbar nicht ausreichend berücksichtigt, während ein schwacher oder fehlender Generationswechsel in der Fischereibranche ein Problem darstellt.
- EU-Gewässer im westlichen Atlantik: Wiederkehrende Ungleichgewichte bei den biologischen und wirtschaftlichen Indikatoren bestimmter Flottensegmente standen im Zusammenhang mit dem Zustand wichtiger Ressourcen, was die Umsetzung von Aktionsplänen erforderlich machte. Die wirtschaftliche Leistungsfähigkeit der Fischereiflotten der Region wurde auch durch die COVID-19 Pandemie beeinträchtigt, insbesondere diejenigen, die sich auf den Frischfischmarkt spezialisiert haben, was von den Interessengruppen als Ursache für Ungleichgewichte genannt wurde. Es mangelt an sozioökonomischen Studien zu den Marktbedingungen, und die sozialen Auswirkungen der Marktbedingungen auf die



wirtschaftliche Leistungsfähigkeit dieser Flotten müsste weiter analysiert werden.

- Ostsee: Die Verfügbarkeit von Ressourcen und Schwankungen der Fischbestände wirkten sich auf die Wirtschaftlichkeit der Flotte aus. Gleichzeitig beeinflussten Faktoren außerhalb der Fischerei, wie beispielsweise Preisschwankungen, die Rentabilität und Nachhaltigkeit der Flotte. Umweltveränderungen wie Klimawandel und Lebensraumzerstörung wirkten sich auf die Verteilung der Fischbestände aus.
- Erweiterter Nordseeraum: Die Quotendynamik, insbesondere die Rolle von Engpassarten wie Kabeljau und Kaisergranat in der gemischten Fischerei, erwies sich als entscheidender Faktor für das Ungleichgewicht. Die bislang begrenzte Anwendung des Quotenaustauschs zwischen den Mitgliedstaaten hat nicht dazu beigetragen, die Kapazitäten wieder ins Gleichgewicht zu bringen. Bei den sozioökonomischen Indikatoren bestehen weiterhin methodische Herausforderungen, darunter Datenfragmentierung und uneinheitliche Berichtsstandards, die eine umfassende Analyse erschweren.
- Gewässer in den Überseegebieten: Das Fehlen ausreichender Quoten und das Missverhältnis zwischen Kapazität und verfügbaren Quoten bzw. die Möglichkeit zum Quotentausch waren die wichtigsten Ursachen für das Ungleichgewicht in der Flotte. Auch die Besteuerung hat die Teilnahme am Abwrackprogramm erschwert, neben einem Arbeitskräftemangel, der ebenfalls als mögliche Ursache für die Inaktivität eines Teils der Flotte genannt wurde.

Es wurden erhebliche Anstrengungen unternommen, um das Problem der Überkapazitäten außerhalb der EU anzugehen, und es wurden verschiedene Mechanismen eingeführt, um die Anreize zum Aufbau von Kapazitäten zu verringern oder Mittel zu ihrer Reduzierung bereitzustellen. Die Studie bietet einen Überblick über die internationalen Erfahrungen mit der Steuerung der Fischereiflottenkapazität einer ausgewählten Gruppe von Ländern mit großen Fischereiflotten, aus denen sich mehrere Lehren ziehen lassen, die im EU-Kontext nützlich sein könnten, nämlich:

- Island: Wie bei Islands ersten Erfahrungen mit Stilllegungsprogrammen haben die aufeinanderfolgenden EU-Strukturfonds für die Fischerei eine dauerhafte Stilllegung überflüssiger Flottenkapazitäten ermöglicht. Ebenso wie in Island sieht auch das fangrechtebasierte Management (wie individuell handelbare Quoten (ITQ)) in der EU Beschränkungen vor, die von teilweisen bis zu vollständigen Übertragungsbeschränkungen von Kapazität reichen, um eine Marktkonzentration zu verhindern. Trotz dieser Beschränkungen haben die ITQs in der EU zu einer gewissen

Konzentration der Fischereirechte und zu einer Verringerung der Flottengröße in einigen EU-Flotten geführt.

- **Südafrika:** Nach einem aktiven partizipativen Prozess mit der Industrie zur Lösung von Kapazitätsproblemen wurde ein System von Fangtagen eingeführt, das auf Motorleistung und Quoten basiert. Es sei darauf hingewiesen, dass ähnliche Initiativen auch in der EU umgesetzt werden könnten und dass die Ad-hoc-Arbeitsgruppen der Beiräte gut geeignet sind, als partizipative Plattformen zu fungieren.
- **Neuseeland:** Nicht-professionelle Fischer können Fischereirechte auf dem Markt erwerben und mit ihnen spekulieren. Auf die EU übertragen würde dies Auswirkungen auf das soziale Gefüge des Fischereisektors haben, da Quoteninhaber von der Ausbeutung einer Ressource profitieren würden, ohne selbst Fischereitätigkeiten auszuüben, wodurch immaterielle Werte wie traditionelle Fischereipraktiken und -werte sowie das Beschäftigungsniveau in der Fischerei und damit verbundenen Tätigkeiten in Fischereigemeinden nicht erhalten blieben.
- **Die Pollack-Fischerei im Beringmeer:** Dem Sektor wurde erlaubt, Gemeinschaftsquoten einzuführen. Dies ermöglichte es den Fischern zusammenzuarbeiten und bis zu einem gewissen Grad in einem Ko-Management mitzubestimmen. Die Studie ergab, dass das EU-Managementsystem noch flexibler ist, da es Quotentausche zwischen Fischereisektoren erlaubt. Erzeugerorganisationen können Quoten der Mitglieder bündeln und Regierungen bitten, Quotentausche mit anderen Mitgliedsstaaten auszuhandeln. Auf der Ebene der Mitgliedsstaaten können Erzeugerorganisationen auch Quoten mit anderen Erzeugerorganisationen tauschen.
- **China:** Chinas Ansatz zum Flottenmanagement unterscheidet sich von dem der EU durch die Vorrangstellung von Input-Maßnahmen (z.B. maximale Anzahl an Seetagen), die ein robustes Durchsetzungssystem erfordern. Wie die EU-Mitgliedstaaten entschädigt auch China die Fischer für die vorübergehende Einstellung ihrer Fischereitätigkeit aus öffentlichen Mitteln, und beide haben auch öffentliche Mittel eingesetzt, um überschüssige Flottenkapazitäten abzubauen. In China ist es auch üblich, unbeschäftigte Arbeitskräfte von verschrotteten Schiffen für andere Tätigkeiten in der Wertschöpfungskette der Fischerei einzusetzen.
- **Norwegen:** Es gibt einige Parallelen zwischen Norwegen und der EU, wie beispielsweise das gemeinsame Ziel, überflüssige Kapazitäten abzubauen und verstärkt auf ein anreizbasiertes Management (z.B. ITQ) zu setzen. Norwegen verfügt nicht mehr über vollständig finanzierte Stilllegungsprogramme oder Fangrechte mit unbefristeter Laufzeit.



- Vereinigtes Königreich: Individuelle Quotenzuteilungen gelten nur für Schiffe, die einer Erzeugerorganisation angehören. Das Vereinigte Königreich hat virtuelle Ansprüche oder „Dummy-Lizenzen“ eingeführt, die es ermöglichen, dass Lizenzen nach der Verschrottung eines Schiffes im System verbleiben, um sie für neu gebaute Schiffe zu verwenden oder den Zugang größerer, modernisierter Schiffe zu erleichtern. Die Einführung solcher Systeme in der EU (einige Länder verwenden bereits virtuelle Lizenzen, die jedoch einer Reihe von Bedingungen unterliegen) würde es den Eignern ermöglichen, Lizenzen und Quoten mit anderen Schiffseignern für Fischereizwecke zu handeln oder ihre Fischereifahrzeuge im Hinblick auf den Umweltschutz und die Lebensbedingungen der Besatzung anzupassen.

**Die GFP ermöglicht den Bau neuer Fischereifahrzeuge mit privaten Mitteln, wobei gleichzeitig Maßnahmen getroffen wurden, um einen Anstieg der Gesamtfangkapazität der Flotte zu verhindern.**

Bei der Verwaltung der EU-Fischereiflotte und der Bekämpfung von Überkapazitäten wurden Alternativen zu den derzeitigen GFP-Proxies (d. h. kW und BRZ) zur Messung der „Fischereikapazität“ geprüft, um festzustellen, ob ergänzende Messgrößen den Zusammenhang mit der „Fangkapazität“ (definiert als „die Fähigkeit, Fisch zu fangen“) besser erfassen und andere Herausforderungen (wie die Modernisierung von Schiffen) angehen. Dazu gehören:

- Sicherheitskapazität: Eine Erhöhung der Bruttoreaumzahl-Obergrenzen zur Verbesserung der Sicherheit an Bord, der Arbeitsbedingungen oder der Produktqualität kann unter bestimmten Bedingungen kontraproduktive Auswirkungen haben. In Spanien kam es um das Jahr 2000 zu mehreren Zwischenfällen mit Schiffen, die von Sicherheitskapazitäts-Zulagen profitiert hatten. Die Gewährung zusätzlicher Kapazitäten für einzelne Schiffe kann unbeabsichtigte negative Auswirkungen haben. So können beispielsweise die Sicherheit auf See und die Arbeitsbedingungen aufgrund der für die BRZ verwendeten Berechnungsmethode oder der Kategorisierung der LÜA beeinträchtigt werden.
- Nettoraumzahl: Einige Interessengruppen behaupten, dass die Nettoraumzahl (NRZ) ein besserer Indikator für die tatsächliche Fangkapazität oder den Fischlagerraum sein könnte. Die Studie ergab jedoch, dass die NRZ-Angabe für Fischereifahrzeuge ungeeignet ist und daher die NRZ-Informationen für Fischereifahrzeuge ungenau macht.
- Potenzielle Fangkapazität: Die Bewertung der „hypothetischen maximalen Jahresfangmenge“ erfordert eine Bewertung der Machbarkeit einer Aufteilung der Bruttoreumzahl (BRZ) in verschiedene Kategorien. Diese Kategorien könnten BRZ\_Sicherheit (z. B. zusätzlicher Platz an Deck), BRZ\_Energiewende (z. B. Platz für Batteriespeicher oder die Installation

eines Wulstbugs oder eines umgekehrten Bugs), BRZ\_Wohlergehen (z. B. mehr Unterkünfte an Bord für den Komfort der Besatzung) und BRZ\_tats.Fangkapazität (d. h. die tatsächliche Kapazität, Fische zu fangen) umfassen. Die Umsetzung dieser Unterscheidungen würde auch die Entwicklung klarer, harmonisierter Definitionen und Protokolle für Schiffsgutachter erfordern, um diese BRZ-Komponenten zu bewerten und zu überprüfen. Die Studie kam zu dem Schluss, dass langfristig auch die Fangkapazität überarbeitet werden sollte, um technologische Fortschritte, die die Fangkapazität im Laufe der Zeit verbessern, zu verfolgen und zu berücksichtigen.

Die Studie dokumentierte auch den starken Zusammenhang zwischen bisheriger Fangkapazität und der tatsächlichen Kapazität, Fische zu fangen sowie die Auswirkungen von Quotenregelungen, Aufwandsregelungen und gemischten Fischereisituationen. Beim Management der EU-Flotte zeigt sich, dass sich die Situation im Nordostatlantik und in den Regionen Mittelmeer und Schwarzes Meer erheblich unterscheidet. Dies ist auf die unterschiedlichen vorherrschenden Fischereibewirtschaftungsregelungen zurückzuführen (d. h. Fangobergrenzen im Nordostatlantik gegenüber Aufwandsbeschränkungen im Mittelmeer und im Schwarzen Meer).

Es gibt **mehrere technologische Lösungen** zur Verbesserung der Energieeffizienz, zur Verwendung alternativer Kraftstoffe für den Schiffsantrieb und zur Verringerung des CO<sub>2</sub>-Fußabdrucks der Fischereiflotte. Die Studie ergab, dass kurzfristige Lösungen zur Senkung des Verbrauchs fossiler Brennstoffe in der Fischerei im Gegensatz zur Umstellung auf neue Kraftstoffarten in der Regel nicht mit einem höheren BRZ/kW-Bedarf verbunden sind. Die Minimierung des Energieverbrauchs – mit Lösungen für mehr Energieeffizienz – vor der Umstellung auf alternative Kraftstoffe trägt auch dazu bei, den möglichen Bedarf an zusätzlichem Lagerraum für Kraftstoff zu minimieren.

Eine übergeordnete Herausforderung für die Flottenpolitik der EU besteht darin, mehr Flexibilität bei den Flottenerneuerungsmaßnahmen zu schaffen, um eine Modernisierung zu ermöglichen, ohne die Flottenkapazität dauerhaft zu verringern oder zu erhöhen. **Die Flottenpolitik muss sicherstellen, dass die Flottenerneuerung und -modernisierung, die möglicherweise zusätzliche Kapazitäten erfordern, nicht zu einer Verbesserung der Möglichkeiten zum Fischfang führt, was zu einem weiteren Ungleichgewicht der Flotte und zu Überkapazitäten führen oder den Druck auf die befischten Bestände erhöhen würde.** Es ist jedoch unklar, ob überhaupt zusätzliche Kapazitäten erforderlich sind, da die tatsächliche aktive Kapazität in den meisten EU-Ländern deutlich unter den länderspezifischen Kapazitätsobergrenzen liegt. Eine Reihe von vorgeschlagenen Maßnahmen und Empfehlungen zur wirksamen Bewältigung und Umverteilung der Fangkapazitäten zwischen den Flottensegmenten, die dann in Kapitel 8 erweitert werden, umfasst

**Empfehlung 1 – Durchführung von Mitgliedstaaten- und segmentspezifischen Studien zur Bewertung des Bedarfs an zusätzlichen Kapazitäten.** Die Studie schlägt vor, zu überprüfen, ob die derzeitigen Obergrenzen die erforderlichen Änderungen ermöglichen können oder überschritten würden, ohne dass dies zu einer Verschärfung der Ungleichgewichte führt.

**Empfehlung 2 – Unterscheidung zwischen Schiffstonnage, die nicht mit der Fangkapazität zusammenhängt, und Schiffstonnage, die mit der Fangkapazität zusammenhängt,** indem die Schiffstonnage in Unterkomponenten aufgeteilt würde, die unterschiedlichen funktionalen Zwecken dienen, wie z. B. eine Sicherheitstonnage, eine Energiewandlungstonnage, eine fischereifähigkeitsbezogene Tonnage und eine Wohlergehenstonnage. Mitgliedsstaaten sollen weiterhin die Schiffstonnage und die Maschinenleistung kontrollieren und überwachen.

**Empfehlung 3 – Untersuchung der Umverteilung der Fangkapazitäten** und Entwicklung einer entsprechenden Steuerungsmaßnahme sowie Erwägung eines marktbasierten Flottenmanagements, z. B. ITQ, vom Schiff unabhängige Lizenzen, Möglichkeiten für Quotentausch und Quotenpools, Entwicklung lokaler Märkte, Förderung eines Managementansatzes für eine bessere Bewertung der Fänge, Übergang von Fischereigeräten mit hoher zu solchen mit geringer Umweltbelastung, Bewertung der Übergangskosten und der Durchführbarkeit.

**Empfehlung 4 – Fortsetzung des EU-Flottenmanagements zur Unterstützung der Fischereimanagementziele** durch Steigerung der Effizienz der Fischereifahrzeuge bei gleichzeitiger Weiterführung der Fang- und Aufwandsbeschränkungen, Beseitigung von Hindernissen, die eine vollständige Ausschöpfung der Quoten verhindern, und Gewährleistung einer nachhaltigen Fischerei als Voraussetzung für die Förderfähigkeit.

**Empfehlung 5 – Begleitende Maßnahmen zur Begrenzung unbeabsichtigter Nebenwirkungen des auf dem Fischereiaufwand basierenden Managements und Ergänzung durch Fangbeschränkungen.** Begrenzung der Fangmöglichkeiten durch strenge Überwachung und wirksame Kontrolle des Fischereiaufwands. Dazu gehören die Begrenzung der zulässigen Fangtage, die Bekämpfung unbeabsichtigter Nebenwirkungen von Managementsystemen, die ausschließlich auf der Kontrolle des Fischereiaufwands basieren, sowie die weitere Suche nach Möglichkeiten zur Verringerung der Anreize für überdimensionierte Motoren.

**Empfehlung 6 – Bemühungen zur Verringerung der Unsicherheit bei Fangempfehlungen** und Überarbeitung der Leitlinien der Europäischen Kommission aus dem Jahr 2014 zur Bewertung des Gleichgewichts der EU-Flotte, um eine bessere Verknüpfung mit dem Risiko einer Überkapazität herzustellen. Dazu gehören eine vorsichtiger Fischerei unterhalb des FMSY-

Referenzwertes und eine Anpassung der „Gleichgewichtsindikatoren“, um die Ursachen für Überkapazitäten zu erfassen.

Eine zentrale Herausforderung für Flottenmanagement mit dem Ziel der Kontrolle der Fangkapazitäten besteht darin, wie mit Effizienzsteigerungen umzugehen ist, die oft unerlässlich sind, um die Wirtschaftlichkeit bestimmter Flottensegmente zu verbessern. Daher kommt die Studie zu dem Schluss, dass das Ziel des Flottenmanagements nicht darin bestehen sollte, die Effizienz auf dem Level einzelner Schiffe zu verringern, sondern vielmehr darin, die Effizienz auf Flottenebene so zu steuern, **um so ein dauerhaftes Gleichgewicht mit den Fangmöglichkeiten zu gewährleisten**. Dies ist die Voraussetzung für eine erfolgreiche Erneuerung der EU-Flotte neben einer Energiewende hin zu einer emissionsarmen Fischerei, die auch einen niedrigeren Impakt hätte.

\*\*\*

## Resumen Ejecutivo [ES]

El objetivo principal de este estudio de investigación es describir la evolución de la flota de la Unión Europea, identificar sus retos presentes y futuros, de qué forma estos retos afectan a la sostenibilidad de la flota, y proporcionar ideas sobre cómo abordar dichos retos. La necesidad de optimizar y gestionar de manera eficaz la capacidad pesquera es un tema recurrente en las reformas de la PPC. Desde la última reforma de la PPC en 2013, la flota pesquera de la UE ha evolucionado y su capacidad nominal ha disminuido. Sin embargo, los informes anuales de los Estados Miembros muestran que, en algunos segmentos de la flota, persisten los desequilibrios, ya que los malos resultados económicos se suman al mal estado de los recursos pesqueros.

**Hoy en día, la flota pesquera de la UE se enfrenta a numerosos retos.** El cambio climático, la pérdida de biodiversidad, y la contaminación marina están reduciendo la productividad de los ecosistemas marinos y las poblaciones de peces, lo que a su vez amenaza la sostenibilidad económica de la flota. Al mismo tiempo, el sector debe acelerar la **transición energética y modernizar los buques**, lo que incluye mejorar las condiciones a bordo para atraer a nuevos operadores y apoyar la renovación generacional de las tripulaciones.

En los últimos años, las partes interesadas del sector pesquero han señalado que los límites máximos de capacidad de la flota obstaculizan el crecimiento, la innovación, la seguridad y la renovación de una flota envejecida. Tal y como se estipula en la modificación de 2013 del Reglamento de la PPC, en la que la capacidad de la flota pesquera de los Estados miembros se controla mediante límites y un régimen de entradas y salidas (artículo 23, PPC de 2013), un nuevo buque solo puede incorporarse a una flota después de que se haya eliminado de la misma flota la capacidad pesquera equivalente (en kW y GT). Además, los fondos del FEMPA solo permiten aumentar el GT de un buque concreto (<24 m) para mejorar la seguridad, las condiciones de trabajo o la eficiencia energética, y solo si dicho buque pertenece a un segmento cuya capacidad pesquera esté en equilibrio con las posibilidades de pesca disponibles.

A pesar de la reducción en valor absoluto de los parámetros utilizados para definir la capacidad de la flota pesquera, como resultado de diversos programas públicos de desguace y de retiro voluntario, **desde el año 2014 hasta la actualidad se han registrado numerosos casos de desequilibrio** entre la flota y las posibilidades de pesca. Por lo tanto, la disminución observada en la capacidad de la flota pesquera de la UE (en términos de kW y GT totales) no se tradujo en un equilibrio general de la capacidad con las posibilidades de pesca disponibles. Dado que el desequilibrio era generalizado, esto contribuye a la **existencia de una diferencia entre el GT real y los límites máximos de GT observados en todos los Estados miembros de la UE**. En consecuencia, los 22 Estados miembros costeros han registrado una disminución anual tanto de su GT como de su kW desde el año 2000.

Para comprender mejor las razones por las que se produce el desequilibrio en los distintos segmentos de la flota de la UE y cuáles son los principales factores que impulsan las tendencias observadas, se elaboraron cinco casos de estudio de diferentes cuencas marítimas. Como se demuestra en estos casos de estudio, no hay garantía de que las limitaciones actuales de la capacidad pesquera sean suficientes para garantizar el equilibrio de las flotas con los recursos pesqueros disponibles. A pesar de algunos avances, los indicadores de la UE muestran que muchos segmentos de la flota siguen estando en desequilibrio. El cambio climático y otros factores medioambientales ajenos a la pesca pueden agravar aún esta situación debido a la falta de flexibilidad de la gestión de la capacidad y la reasignación de cuotas. Lograr un mejor equilibrio entre la capacidad de la flota y las posibilidades de pesca no solo garantizaría que la industria pesquera sea elegible a ayudas públicas, sino que también permitiría la modernización de los buques sin necesidad de ayudas públicas.

Los **principales factores** que las partes interesadas citaron en los casos de estudio como causantes del desequilibrio son:

- Mediterráneo occidental: El deterioro de los principales indicadores económicos estuvo estrechamente relacionado con un aumento significativo de los costes operativos y tuvo un impacto negativo en las flotas. Se ha observado una lenta mejora de las poblaciones, y las principales poblaciones de interés comercial, como la merluza, siguen estando por debajo de la biomasa objetivo. Se considera que no se han tenido en cuenta los aspectos económicos y sociales a la hora de evaluar las razones del desequilibrio de la flota, mientras que la debilidad o la falta de renovación generacional de la mano de obra pesquera es un problema.
- Aguas Occidentales de la UE: Los desequilibrios recurrentes en los indicadores biológicos y económicos de algunos segmentos de la flota estuvieron relacionados con el estado de recursos claves, siendo necesario ejecutar Planes de Acción urgentes. El rendimiento económico de las flotas pesqueras de la región también se vio afectado por la pandemia del COVID-19, en particular las especializadas en el mercado del pescado fresco. Se carece de estudios socioeconómicos sobre las condiciones del mercado. Sería necesario analizar más a fondo el impacto social de dichas condiciones en el rendimiento económico de estas flotas.
- Mar Báltico: La disponibilidad de recursos y las fluctuaciones de las poblaciones de peces afectaron a la viabilidad económica de la flota. Al mismo tiempo, factores externos a la pesca, como las variaciones de precios, afectaron a la rentabilidad y la sostenibilidad de la flota. Los cambios medioambientales, como los debidos al cambios climáticos y la degradación del hábitat, afectaron a la distribución de los stocks.
- Gran Mar del Norte: La dinámica de las cuotas, en particular el papel de especies limitantes como el bacalao y la cigala en las pesquerías mixtas,

se reveló como un factor determinante del desequilibrio. La aplicación limitada del intercambio de cuotas entre los Estados Miembros hasta la fecha no ha contribuido a reequilibrar la capacidad. Persisten los retos metodológicos en los indicadores socioeconómicos, incluida la fragmentación de los datos, y la falta de coherencia en las normas de notificación, lo cual dificulta un análisis exhaustivo.

- Aguas exteriores de la UE: La falta de cuotas suficientes y el desajuste entre la capacidad y la disponibilidad de cuotas, o la posibilidad de intercambiar cuotas, fueron las causas más importantes del desequilibrio de la flota. La fiscalidad también ha desincentivado la participación en el programa de desguace, además de la escasez de mano de obra, que también se menciona como posible causa de la inactividad de parte de la flota.

En el ámbito internacional los países han realizado esfuerzos considerables para abordar el problema de la sobrecapacidad y se han establecido diversos mecanismos para reducir los incentivos a acumular capacidad o proporcionar los medios para reducirla. El estudio ofrece una visión general de la experiencia internacional en la gestión de la capacidad de la flota pesquera de un grupo selecto de países con grandes flotas pesqueras, lo que puede ayudar a extraer varias lecciones que podrían ser útiles en el contexto de la UE, a saber:

- Islandia: Al igual que en la experiencia inicial de Islandia con los planes de desguace, los sucesivos fondos estructurales de la UE para la pesca han permitido el cese definitivo de la capacidad excedente de la flota. Además, al igual que en Islandia, la gestión basada en derechos en la UE impone restricciones que van desde restricciones parciales hasta restricciones totales a la transferibilidad para evitar la concentración del mercado. A pesar de estas restricciones, las cuotas individuales transferibles (CIT) en la UE han dado lugar a un cierto grado de concentración de los derechos de pesca y a la reducción de algunas flotas de la UE.
- Sudáfrica: Se ha implantado un sistema de días de pesca basado en la potencia del motor y las cuotas, tras un proceso participativo activo con la industria para abordar las cuestiones relacionadas con la capacidad. Cabe señalar que podrían aplicarse iniciativas similares en la UE, y que los grupos de trabajo técnicos ad hoc de los consejos consultivos están bien situados para actuar como plataformas participativas.
- Nueva Zelanda: Los pescadores no profesionales pueden adquirir derechos de pesca en el mercado y negociar con ellos. Si esto se aplicara a la UE, afectaría al tejido social del sector pesquero, ya que los titulares de cuotas se beneficiarían de la explotación de un recurso sin realizar ellos mismos ninguna actividad pesquera. Esto impediría preservar activos intangibles, como las prácticas y los valores tradicionales de la



pesca, así como mantener los niveles de empleo en la pesca y las actividades relacionadas con ella en las comunidades pesqueras.

- La pesca del abadejo en el mar de Bering: se permitió al sector establecer cuotas cooperativas, lo que permitió a los pescadores cooperar y contribuir a la gestión mediante un cierto grado de cogestión. El estudio reveló que el sistema de gestión de la UE es aún más flexible, ya que permite los intercambios entre sectores, y las OPs pueden poner en común las cuotas de sus miembros y solicitar a los gobiernos que negocien intercambios de cuotas entre países. A nivel de los Estados Miembros, las OPs también pueden intercambiar cuotas con otras OPs.
- China: El enfoque de China respecto a la gestión de la flota difiere del de la UE en cuanto al predominio de medidas de gestión de los inputs, que requieren un sistema de aplicación robusto. China, al igual que los Estados miembros de la UE, compensa a los pescadores por el cese temporal de la actividad pesquera con fondos públicos, y ambos han utilizado también recursos públicos para eliminar la sobrecapacidad de la flota. China también suele reasignar la mano de obra pesquera ociosa de los buques desguazados a otras actividades de la cadena de valor de la pesca.
- Noruega: Existen algunos paralelismos entre Noruega y la UE, como el objetivo común de eliminar la sobrecapacidad y el mayor uso de la gestión basada en derechos. Noruega ya no cuenta con planes de desmantelamiento totalmente financiados con recursos públicos ni con derechos de duración permanente.
- Reino Unido: Las asignaciones de cuotas individuales solo se aplican a los buques que pertenecen a una organización de productores. El Reino Unido innovó con los derechos virtuales, o «licencias ficticias», que permiten que las licencias permanezcan en el sistema después de que un buque haya sido desguazado, para su uso con buques de nueva construcción o para facilitar la entrada de buques más grandes y modernizados. La adopción de este tipo de sistemas en la UE (algunos países ya utilizan licencias virtuales, pero están sujetas a una serie de condiciones) permitiría a los propietarios intercambiar licencias y cuotas con otros propietarios de buques con fines pesqueros, o adaptar sus buques pesqueros para la protección del medio ambiente y la habitabilidad de la tripulación.

La PPC permite la construcción de nuevos buques pesqueros con recursos privados, junto con salvaguardias para evitar que aumente la capacidad pesquera total de la flota. A la hora de gestionar la flota pesquera de la UE y abordar la sobrecapacidad, se pueden explorar alternativas a los actuales indicadores de la PPC (es decir, kW y GT) para medir la «capacidad pesquera», el estudio analizó alternativas para determinar si hay métricas complementarias



que reflejen mejor el vínculo con la «capacidad de captura» (definida como «la capacidad de pescar») y aborden otros retos (como la modernización de los buques). Entre ellas se incluyen:

- Tonelaje de seguridad: el aumento de los límites máximos de capacidad en GTs para mejorar la seguridad a bordo, las condiciones de trabajo o la calidad de los productos en determinadas condiciones puede tener efectos contraproducentes. En España, por ejemplo, alrededor del año 2000, se reportaron varios incidentes que involucraban buques que habían obtenido asignaciones de tonelaje de seguridad. Otorgar capacidad adicional a buques individuales puede por tanto tener efectos adversos no deseados. Por ejemplo, la seguridad en el mar y las condiciones de trabajo pueden verse comprometidas debido al método de cálculo utilizado para el GT o la categorización de la LOA.
- Tonelaje neto: Algunas partes interesadas afirman que el tonelaje neto (NT) puede ser un mejor indicador de la capacidad real de pesca o del espacio de almacenamiento de pescado. Sin embargo, el estudio reveló que la declaración del NT no es adecuada para los buques pesqueros y, por lo tanto, la información sobre el NT es inexacta en el caso de estos buques.
- Capacidad pesquera potencial: Para evaluar la «captura máxima anual hipotética» será necesario evaluar la viabilidad de dividir el GT en diferentes categorías. Estas categorías podrían incluir GT\_seguridad (por ejemplo, espacio adicional en cubierta), GT\_transición energética (por ejemplo, espacio para el almacenamiento de baterías o la instalación de una proa con bulbo o invertida), GT\_bienestar (por ejemplo, más espacio a bordo para la comodidad de la tripulación) y GT\_capacidad\_captura (es decir, capacidad de captura). La aplicación de estas distinciones también requeriría el desarrollo de definiciones y protocolos claros y armonizados para que los inspectores marítimos evalúen y verifiquen estos componentes de GT. A largo plazo, el estudio concluyó que también debería revisarse la capacidad pesquera para hacer un seguimiento y tener en cuenta los avances tecnológicos que mejoran la capacidad de captura a lo largo del tiempo.

El estudio también documentó la fuerte vinculación entre la capacidad pesquera y la capacidad de captura, así como el impacto de los regímenes de cuotas, los regímenes de esfuerzo y las situaciones de pesca mixta. En la gestión de la flota de la UE, se ha constatado que la situación en las regiones del Atlántico nororiental y del Mediterráneo y el Mar Negro difiere significativamente. Esto se debe a los diferentes regímenes de gestión pesquera dominantes que se aplican (es decir, controles de producción en el Atlántico nororiental frente a controles de entrada en el Mediterráneo y el Mar Negro).

Existen múltiples soluciones tecnológicas para mejorar la eficiencia energética, utilizar combustibles alternativos para la propulsión de los buques y reducir la huella de carbono de la flota pesquera. El estudio ha revelado que, a diferencia de la transición a nuevos tipos de combustible, las soluciones a corto plazo para reducir el consumo de combustibles fósiles en la pesca no suelen implicar un aumento de GT/kW. Minimizar el consumo de energía —con soluciones para una mayor eficiencia energética— antes de pasar a combustibles alternativos también ayudará a minimizar la posible necesidad de aumentar el espacio de almacenamiento de combustible.

Un reto general para la política de la flota de la UE es proporcionar más flexibilidad en las políticas de renovación de la flota para permitir la modernización sin reducir permanentemente la capacidad de la flota. Al mismo tiempo, **la política de la flota debe garantizar que la renovación y modernización de la flota, que pueden requerir capacidad adicional, no den lugar a una mejora de la capacidad de captura, lo que provocaría un mayor desequilibrio de la flota y sobrecapacidad**, o ejercería más presión sobre las poblaciones explotadas. Sin embargo, no está claro si se necesita realmente capacidad adicional, dado que la capacidad activa real está muy por debajo de los límites máximos de capacidad específicos de cada país para la mayoría de los países de la UE. Hasta ahora, se ha informado de la capacidad no utilizada de los buques inactivos. Entre las medidas y recomendaciones propuestas para abordar y reasignar eficazmente la capacidad pesquera entre los distintos segmentos de la flota figuran las siguientes:

**Recomendación 1: realizar estudios específicos por Estado Miembro y segmento para evaluar la necesidad de capacidad adicional.** El estudio sugiere examinar si los límites máximos actuales pueden adaptarse a los cambios necesarios o si se superarían, sin que ello dé lugar a un aumento de las situaciones de desequilibrio.

**Recomendación 2: distinguir el volumen de los buques que no está relacionado con la capacidad de captura**, incluyendo la descomposición del volumen de los buques en subcomponentes que aborden diferentes fines funcionales, como un GT de seguridad, un GT de transición energética, un GT relacionado con la capacidad de pesca y un GT de bienestar, y continuar controlando y supervisando los volúmenes de los buques y la potencia de los motores.

**Recomendación 3: Explorar la redistribución de la capacidad pesquera y desarrollar la gobernanza adecuada para ello**, así como considerar la gestión de la flota basada en el mercado (por ejemplo, cuotas individuales, licencias independientes del buque, posibilidades de intercambio y agrupación de cuotas, desarrollo del mercado local, promoción de la gobernanza para una mejor valoración de las capturas, transición de artes de pesca de alto impacto a otras de bajo impacto, evaluación de los costes de transición y de viabilidad).

**Recomendación 4: continuar con la gestión de la flota de la UE en apoyo de los objetivos de gestión pesquera**, aumentando la eficiencia de los buques y continuando con la aplicación de límites de captura y esfuerzo, eliminando las barreras que impiden el pleno aprovechamiento de las cuotas y garantizando la sostenibilidad de la actividad pesquera como requisito previo para poder optar a la financiación.

**Recomendación 5: controlar los efectos secundarios no deseados de la gestión basada en el esfuerzo y complementarla con límites de captura.** Limitar la capacidad de captura mediante una estrecha supervisión y un control eficaz del esfuerzo pesquero. Esto incluye restringir el número de días de pesca permitidos, abordar los efectos secundarios no deseados asociados a los sistemas de gestión basados únicamente en controles del esfuerzo y seguir investigando formas de reducir los incentivos a la instalación de motores de kW sobredimensionados.

**Recomendación 6: Trabajar para reducir la incertidumbre de las recomendaciones de captura** y revisar las directrices de la CE de 2014 de evaluación del equilibrio de la flota de la UE más relacionadas al riesgo de sobrecapacidad. Esto incluye pescar con más precaución por debajo del  $F_{MSY}$  y modificar los indicadores de «equilibrio» para captar los factores que impulsan la sobrecapacidad.

Uno de los principales retos de la gestión de la flota enfocada al control de la capacidad pesquera es cómo incorporar las mejoras en la eficiencia que son a menudo esenciales para la viabilidad económica de determinados segmentos de la flota. Por lo tanto, el objetivo de la gestión de la flota no debe ser reducir la eficiencia de los buques individuales, sino gestionar la eficiencia a nivel de flota para **garantizar un equilibrio persistente con las oportunidades pesqueras**, como requisito previo para el éxito de la renovación de la flota de la UE, junto con una transición energética hacia una pesca con bajas emisiones de carbono y bajo impacto.

\*\*\*

# 1 Introduction

## 1.1 Background

The imbalance between the European Union's (EU) fishing fleet capacity <sup>(1)</sup> and the resources they fish for, has been an important factor behind the historic overexploitation of resources in European waters. The 2009 Green Paper on the Common Fisheries Policy (CFP) (European Commission, 2009a) highlighted that overcapacity <sup>(2)</sup> of the European fishing fleet was a fundamental problem of the CFP. Efforts since the 2013 reform of the CFP to manage fisheries in accordance with the maximum sustainable yield (MSY) objective have improved the state of many fish stocks and brought reductions in fleet size. Currently, all Union fishing fleets are below the capacity ceilings set under Article 22 in the CFP Regulation (EU) No 1380/2013 <sup>(3)</sup>. Nevertheless, despite an overall decrease in the total number of EU fishing vessels, overcapacity still exists today for certain sectors. Overcapacity undermines both the sustainability of fish stocks and the long-term viability of the fishing sector. It also puts high pressure on marine ecosystems and habitats. The need for optimising fishing capacity and managing it more effectively is a recurrent theme in reforms of the CFP.

The management of fishing capacity is an important pillar of the fisheries management under the CFP <sup>(4)</sup>. The 2013 reform of the CFP included a policy specific to the management of the fleet, aimed to contribute to the CFP objectives. Concretely, it ensures that the European fleet does not expand and that its size is managed in a way to bring a balance between the environmental, social and economic objectives of the policy. Specifically, in addition to the entry/exit system of 'one-in, one-out', EU Member States (MS) must ensure that their national fleet does not exceed, at any time, the fishing capacity ceilings (in terms of overall gross tonnage and engine power measured in kilowatt) as set out in the CFP Regulation. This is complemented with the requirement in Article 22(1) of the CFP Regulation which requires Member States to *'put in place measures to adjust the fishing capacity of their fleet to their fishing opportunities over time, taking into*

---

(1) Fishing capacity means a vessel's tonnage in GT (Gross Tonnage) and its power in kW (Kilowatt).

(2) FAO has published a paper referring to excess capacity and overcapacity, the first being a short run phenomenon and the latter being a long run phenomenon (FAO, 2002)

(3) OJ L 354, 28.12.2013, ELI: <https://eur-lex.europa.eu/eli/reg/2013/1380/oj>

(4) Part IV of Regulation (EU) No 1380/2013

*account trends and based on best scientific advice, with the objective of achieving a stable and enduring balance between them'.*

Since the 2013 CFP reform, the EU fishing fleet has evolved, and its nominal capacity decreased. However, yearly reports of Member States show that, at fleet segment level, many imbalances remain whereby weak economic performance is coupled with a poor state of fish resources.

Today, the EU's fishing fleet faces many challenges such as climate change and marine pollution which are affecting the productivity of ecosystems and fish stocks and therefore the economic sustainability of the fleet. Other challenges include technological creep <sup>(5)</sup>; the need for energy transition to reduce over-reliance on fossil fuels and, in turn, price variability; and the need for better conditions on board, also to attract and promote generational renewal of the workforce. These are only a few examples of the challenges affecting the fleet.

In recent years, stakeholders have been criticizing that growth, innovation, safety and renewal of an ageing fleet <sup>(6)</sup> are hindered by:

- the fleet capacity ceilings (country specific ceilings Article 22 of the 2013 CFP, or induced by some engine power limitations implemented by some management plans of certain fisheries) and
- the entry/exit scheme (Article 23 of the 2013 CFP).

## 1.2 Main objectives and structure of the report

The main objective of this research study is to provide a description of the current European Union's fleet, identify present and future challenges and explain how these challenges impact the fleet's sustainability, as well as provide insights on how to address these challenges. The following provides a summary outline of this report.

**Section 2** of this report provides the **historic background and evolution of the EU fishing fleet policy**, starting from the analysis provided as a basis for the 2009 Green Paper and the impact assessment for the Commission proposal

---

<sup>(5)</sup> The technological development which continuously increases the efficiency of the vessels is a mechanism referred to as technological creep (see Eigaard et al., 2014).

<sup>(6)</sup> The 2022 common fisheries policy and common market organisation reports: your opinion counts – take part in targeted consultations: [https://oceans-and-fisheries.ec.europa.eu/news/2022-common-fisheries-policy-and-common-market-organisation-reports-your-opinion-counts-take-part-2021-12-17\\_en](https://oceans-and-fisheries.ec.europa.eu/news/2022-common-fisheries-policy-and-common-market-organisation-reports-your-opinion-counts-take-part-2021-12-17_en).

leading to the 2013 CFP reform, to the present, highlighting key milestones that have shaped the current EU fleet.

The **state of play of the EU fishing fleet and fleet mapping** is presented in **Section 3**. This provides a description of the EU fishing fleet and to present a visualisation of the fleet's distribution based on different elements, including sea-basin/region, type of fishery, and type of vessel (gear or métier or fleet segment).

**Section 4** provides an overview of the **main trends of imbalance in the EU fishing fleet and fleet segments** that appear to be out of balance with their fishing opportunities between 2015-2023. To help better understand the reasons why imbalanced fleets occurred, five **case studies** with stakeholder consultation are investigated. The five case studies were conducted in different sea basins for fisheries (or fleet segments) which appear to be imbalanced for several years.

The study further provides a review of **international experience in the management of fishing fleet capacity** in **Section 5** to help identify best practices that could be useful to the EU context, identifying what systems could be applied to managing fleet capacity within the current EU fisheries management framework.

Drawing on previous knowledge and examples from international fleet policy, the study further explores the current and future challenges and how these affect fleet management, including an analysis of possible alternative ways of addressing these challenges. More specially, **Section 6** proposes a **definition of fishing capacity**, including alternative or additional elements for defining fishing capacity, an assessment of the feasibility to increase a vessel's GT and/or kW without increasing its ability to catch fish, and the concept of fleet renewal and future challenges including vessel modernisation for energy transition.

**Section 7** examines the impacts of **fishing capacity management** approaches, particularly in fisheries where Total Allowable Catches (TACs) and quotas are present.

Finally, and drawing on the results of all the previous sections a **summary of the findings, key future challenges and general recommendations** is provided in **Section 8**, supported by additional information within Annexes to the report.

## 2 Historic policy background and milestones that shaped EU fleet policy

Since the establishment of the CFP, the evolution of EU fleet policy has been shaped by major reforms and political, scientific and social insights. The CFP reforms of 1992, 2003 and 2013 have each played an important role in this process, aiming to reduce fleet overcapacity, enhance sustainability and ensure economic viability and social fairness in the fishing industry.

Following these reforms, important changes have taken place in the governance of fleet policy. One of the most important shifts has been the gradual decentralisation of responsibility for managing and reducing fishing capacity, with key transferred functions from the EU level to individual Member States. In parallel, regulatory oversight has tightened with increased requirements for monitoring, control and reporting.

This review assesses the scientific instruments and monitoring programmes used to track the performance of the CFP. In addition, it examines the financial tools developed within the EU structural policy to align financial capacity with policy objectives in managing the EU fleet capacity <sup>(7)</sup>.

Links between the EU fleet policy and approaches beyond the EU are not included in this review, but they are addressed in Section 5.

### 2.1 Policy evolution leading to 2013 CFP reform

Since its establishment in 1983, the CFP has undergone major reforms in 1992, 2002 and 2013, which marked key milestones in the evolution of the EU fleet policy (Table 1). The introduction of the Multi-Annual Guidance Programmes (MAGPs), starting with MAGP I (1983–1986), was pivotal to early developments of fleet capacity management by introducing two monitoring metrics: gross tonnage (GT), a measure of the vessel's volume, and engine power, in kilowatts (kW).

As a result of a continued expansion of fishing activity, MAGP II (1987–1991) introduced binding targets requiring Member States to reduce the number of fishing vessels, their GT and kW, which marked the start of the development of national fleet capacity targets and ceilings. These capacity ceilings, based on capacity reference levels established by Article 12 of Council Regulation (EC) No

---

<sup>(7)</sup> Financial tools include the European Fisheries Fund (EFF), the European Maritime and Fisheries Fund (EMFF), and the European Maritime, Fisheries and Aquaculture Fund (EMFAF), which have been used to support fleet renewal, modernisation, safety and traceability improvements, as well as temporary or permanent cessation of fishing.



2371/2002, set maximum allowed thresholds for the power and size of national fleets. The effectiveness of these programmes, however, was limited. At the end of the last MAGP (MAGP V) in 2007, an increase in average vessel size was observed, despite a reduction in crew size (Perez-Labajos, 2012). The progress of capacity adjustment programmes was further hampered by the need to balance competing political, economic and socio-economic interests (Lindebo et al., 2002).

During this time, the European Commission identified several issues, including the variety of fleet capacity metrics defined and measured across Member States; complex fleet segmentation; numerous amendments to policy objectives; and the failure to implement biological advice into fishing mortality cutbacks (Lindebo et al., 2002). In this, the lack of reliable and harmonised capacity indicators was considered as key obstacle to achieving reductions in fishing capacity reduction through MAGPs (Box 1).

#### **Box 1. Evolution of terminology to define fleet capacity in EU.**

Over time, the terminology used in fleet policy-related legislation to describe vessel capacity has changed, resulting in some inconsistencies. These terms include:

- **Fishing capacity:** Defined within the CFP based on two physical characteristics of fishing vessels: gross tonnage (GT), a measure of the vessel's volume, and engine power in kilowatts (kW). In CFP documents, the term 'fishing capacity' is often used inconsistently, sometimes referring to a broader set of factors beyond its formal definition.
- **Harvesting capacity:** All means that determine a vessel's ability to catch fish including fleet capacity metrics monitored under the CFP (i.e. GT and kW), and additional elements such as gear characteristics (e.g. size and geometry); towing force under full power (i.e. bollard pull); fish-finding equipment; fish hold capacity, and rates at which hold can be filled and emptied, which depend on the fishing method.
- **Fishing effort:** The product of the capacity and the activity of a fishing vessel (e.g. the sum of fishing effort of all vessels in a group of fishing vessels) as defined by Article 4 of the CFP (Regulation (EU) 1380/2013).

The MAGPs were further refined during the **2002 CFP reform** with the aim of imposing stricter controls on fleet overcapacity and introducing more effective management strategies through recovery and management plans. Regional Advisory Councils (RACs) were established to increase stakeholder involvement. From this point forward, the EC was required to publish annual reports on the implementation of the EU fleet policy. These reports were primarily based on national reports submitted by Member States, as mandated under Article 14 of

Council Regulation (EC) No 2371/2002 <sup>(8)</sup> and re-affirmed in Article 31 of the 2002 CFP.

The **2009 Green Paper on the Reform of the Common Fisheries Policy**, later referred to as the 2009 Green Paper, marked an important moment in shaping the future policy direction. It addressed the persistent issues of fleet overcapacity and unclear policy objectives combined with poor compliance and enforcement and stressed the need for a long-term sustainable ecosystem-based approach to fisheries management, while advocating for broader stakeholder engagement (European Commission, 2009a). It emphasized the need for built-in mechanisms in the future CFP to ensure that the size of the EU fishing fleet is adapted to available resources. The 2009 Green Paper laid the conceptual foundation for the 2013 CFP reform, particularly in promoting regionalisation as a policy element (European Commission, 2009a).

In 2011, the European Commission proposed reforms to the CFP, including the introduction of a market-based system of Transferable Fishing Concessions (TFC) (European Commission, 2011b). TFCs are right-based permits that grant holders a set share of a Member State's yearly fishing quota or allowable effort, aiming to boost efficiency, curb fleet overcapacity, and improve the sector's economic viability. The introduction of a system of TFCs was expected to be a major driver for fleet capacity adjustment. The impact assessment (European Commission, 2011b) carried out in relation to the reform of the CFP has shown clear, positive, and significant contributions from such a system of TFCs to eliminate overcapacity and improve the economic results of the fishing industry. However, the European Commission's proposal for mandatory TFCs in the CFP were rejected by the co-legislators (Council of the EU and the European Parliament) in favour of a system that allows Member States to voluntarily introduce TFCs or other rights-based management tools. The primary reason for rejecting mandatory TFCs was concern that they would lead to the concentration of fishing rights in the hands of a few large companies, negatively impacting small-scale fishers and communities (Weissenberger, 2013).

In preparation for the 2013 CFP reform, the EC conducted an impact assessment of its 2012 proposal (European Commission, 2011a), which highlighted several potential risks associated with financial support. The assessment recognised that funding vessel modernisation and equipment upgrades (i.e. energy efficient engines) could unintentionally lead to increased fishing pressure through increased harvesting capacity. These enhancements, while beneficial for working conditions, safety and efficiency, could enable vessels to reach fishing grounds faster, with less fuel, and increase operational productivity. Consequently, without careful management, this development might undermine stock recovery efforts.

---

<sup>(8)</sup> OJ L 358, 31.12.2002, ELI: <http://data.europa.eu/eli/reg/2002/2371/oj>

## 2013 CFP reform

The **2013 CFP reform** marked a significant shift towards more sustainable fisheries management by making fishing at sustainable levels a legally binding commitment (Council Regulation (EU) No 1380/2013) <sup>(9)</sup>. One of the key elements was the continuation of capacity ceilings (Article 22, 2013 CFP), which set limits on the overall size of the fishing fleet in terms of gross tonnage (GT) and engine power (kW)<sup>(10)</sup>. This added to the obligation for the Member States to report annually on the balance between the fishing capacity of their fleets and the fishing opportunities. The aim of these capacity ceilings is to reduce the risk of overcapacity, by controlling the physical fishing capacity of the fleet, and to report on the results of Member States' efforts to achieve a sustainable balance.

In addition to this, the entry/exit regime (Article 23, 2013 CFP) was designed <sup>(11)</sup> to ensure that the size of the fishing fleet is aligned with the available resources and to prevent overfishing. This regime regulates the EU fishing fleet capacity by requiring that any increase in capacity through the entry of new vessels is balanced by the exit of other vessels, usually older or less efficient ones.

Member States are obliged to establish and monitor an overall capacity ceiling for their national fleet. Following the scrapping of a vessel with public financial aid, the Member State must revise their capacity ceiling accordingly to prevent that capacity from being reintroduced. Some vessels also leave the fleet without public financial aid, for reasons such as private decisions, retirement or economic pressures, which also contributes to capacity reduction. In the latter case, the country specific capacity ceilings are not affected.

However, the European Court of Auditors (2017) concluded that compliance with both capacity ceilings and the entry/exit regime requirements of each Member State has to be more closely monitored. This conclusion was based on audits and assessments of MS self-reporting data.

## 2.2 Developments following the 2013 CFP reform

A recent evaluation of the 2013 CFP Reform, as outlined in the **2023 CFP Implementation Report** (European Commission, 2023a), considers the current CFP adequate to achieve its objectives. However, the report proposes several areas for improvement to ensure long-term sustainable fisheries management. These include socio-economic aspects, the adoption of ecosystem-based approaches, and considerations of the availability of food supply. The report also

---

<sup>(9)</sup> OJ L 354, 28.12.2013, ELI: <https://eur-lex.europa.eu/eli/reg/2013/1380/oj>

<sup>(10)</sup> As a continuation of CFP 2002 (Article 12 “Reference levels for fishing fleets”)

<sup>(11)</sup> As a continuation of CFP 2002 (Article 13 “Entry/Exit scheme and overall capacity reduction”)

acknowledges several unforeseen challenges that have emerged since the 2013 CFP reform, such as the UK withdrawal from the EU, COVID-19 pandemic, energy crisis and climate change, plus the unprovoked Russian aggression against Ukraine.

Furthermore, the European Green Deal and 2030 Biodiversity Strategy set ambitious environmental and sustainability goals that influence the objectives and implementation of the CFP. A brief overview of these initiatives, along with the 2024 mission letter of Commissioner Kadis, contextualise their impact on future sustainable fisheries management and the fleet policy for a balanced EU fleet.

## UK's withdrawal from the EU

Following the United Kingdom's (UK) withdrawal from the EU ("Brexit"), the UK is no longer bound by the rules of the CFP as of January 2021 (Churchill, 2022). Instead, the **UK-EU Trade and Cooperation Agreement (TCA)** <sup>(12)</sup> entered into force on 1 May 2021, providing a framework for fishing rights between the UK and EU. The TCA sets out the framework for provisions on fishing grounds accessibility and quota allocations for shared stocks during the transitional period between 1 January 2021 and 31 December 2025. Through Decision No 1/2025 <sup>(13)</sup>, the agreement is extended to 30 June 2038.

The TCA has also established systematic legal mechanisms for resolving fishery disputes, which is vital for addressing potential future conflicts between both parties (Zhu & Xu, 2024). While the agreement ensures substantial EU access to UK waters, including within the 6-12 nautical mile territorial waters (Stewart et al., 2022), new complexities for both sides are introduced, ranging from transitional to long-term challenges.

For the EU, Brexit has created operational and political challenges, particularly in adjusting the distribution of fishing opportunities across Member States. In addition, EU vessels may need to adapt to different UK regulatory standards, including gear or technical measures, when operating in UK waters. For the UK, the need to enforce fisheries policy independently, to manage stakeholders' expectations and to deal with quota reallocation or access decisions gives both challenges and opportunities.

## European Green Deal

The **European Green Deal** is the EU's overarching strategy to achieve climate neutrality by 2050. It aims to transform the EU into a resource-efficient, modern and competitive economy by ensuring no net emission of greenhouse gases

---

<sup>(12)</sup> OJ L 149, 30.4.2021, ELI: [https://eur-lex.europa.eu/eli/agree\\_international/2021/689\(1\)/oj](https://eur-lex.europa.eu/eli/agree_international/2021/689(1)/oj)

<sup>(13)</sup> OJ L, 2025/1231, 20.6.2025, ELI: <http://data.europa.eu/eli/dec/2025/1231/oj>

(GHG) by 2050, economic growth decoupled from resource use, while not leaving anybody or any place behind in the transition. The legally binding framework for achieving climate neutrality is established in the European Climate Law (Regulation (EU) 2021/1119) <sup>(14)</sup>.

As part of its comprehensive environmental goals, the European Green Deal places strong emphasis on protecting the marine environment. Key priorities include safeguarding marine biodiversity and ecosystems, reducing pollution, promoting circular economy, improving waste management, and introducing strict measures on fleet capacity to align with ecological limits and ensuring the long-term sustainability of the fisheries sector and broader blue economy.

### EU 2030 Biodiversity Strategy

The EU 2030 Biodiversity Strategy is a core component of the European Green Deal with the aim of halting biodiversity loss and restoring ecosystems across the EU by 2030. It mandates the legal protection of at least 30% of EU marine areas, with one third of these under strict protection (i.e. no fishing or mining), and prioritises the restoration of degraded marine ecosystems. The CFP aims to manage potential conflicts between biodiversity conservation and fishing activities by encouraging the designation of Marine Protected Areas (MPAs) and adopting ecosystem-based approaches to fisheries management (Hermoso et al., 2022). The new goals for MPA establishment are considered to be challenging for fleet management by affecting existing activities, although they offer an opportunity to bridge fisheries management and conservation (Bergström et al., 2022).

In 2024, the Nature Restoration Regulation (Regulation (EU) 2024/1991) <sup>(15)</sup> entered into force which is a key element of the EU Biodiversity Strategy (European Commission, 2020). The Regulation sets quantified and time-bound restoration targets, in terms of marine surface area to be further protected, for habitats included in Annex I of the Habitats Directive <sup>(16)</sup>. Also, it establishes targets for protected species under the Habitats and Birds Directives and restoration targets for essential marine habitats covered by the directives and the Marine Strategy Framework Directive (MSFD). This endeavour is foreseen to affect existing activities, with subsequent changes in fishing opportunities and impacts on their balance with the current EU fishing capacity.

---

<sup>(14)</sup> OJ L 243, 9.7.2021, ELI: <http://data.europa.eu/eli/reg/2021/1119/oj>

<sup>(15)</sup> OJ L, 2024/1991, 29.7.2024, ELI: <http://data.europa.eu/eli/reg/2024/1991/oj>

<sup>(16)</sup> OJ L 206, 22.7.1992, ELI: <http://data.europa.eu/eli/dir/1992/43/oj>

## 2024 Mission letter for Commissioner Costas Kadis

Following the European Parliament elections in 2024 and the subsequent formation of a new College of Commissioners, Costas Kadis was appointed as Commissioner for Fisheries and Oceans. In his **mission letter** <sup>(17)</sup>, the Commissioner is mandated to develop and implement a long-term strategic vision for European fisheries, aquaculture, and broader blue economy sectors by 2040. This vision aims to foster resilience, competitiveness, and sustainability, by managing EU fishing fleets while contributing to securing European food sovereignty. For the development and implementation of the long-term strategic vision, the Commissioner will undertake a comprehensive evaluation, refinement and enhancement of the CFP, with particular attention to environmental, economic and social dimensions of the fleet policy.

Additionally, the Commissioner will, amongst other things, promote sustainable fisheries partnerships, advance the new European Ocean Pact (European Commission, 2025b), and lead the EU's efforts against illegal, unreported and unregulated (IUU) fishing, which incidentally also contributes to fleet overcapacity in certain segments of the EU fishing sector.

---

<sup>(17)</sup> [https://commission.europa.eu/about/organisation/college-commissioners/costas-kadis\\_en#documents](https://commission.europa.eu/about/organisation/college-commissioners/costas-kadis_en#documents)



**Table 1 – Key policy legislations, documents and regulations with objectives and outcomes that shaped the EU Fleet Policy**



Source: Own elaborations



## 2.3 Tools to support the EU fleet policy

The evaluation of scientific instruments and monitoring programs used to track the performance of the EU fleet policy, along with the financial tools developed within the EU's structural policy, are integral to understanding how the EU manages and regulates fleet capacity in alignment with policy objectives (Table 2). The key scientific advisory bodies and monitoring tools, fleet capacity management tools (see Section 3.1), and financial instruments are essential in the EU's fleet policy architecture.

### 2.3.1 Scientific advisory bodies and monitoring tools

The **Data Collection Framework (DCF)** is one of the primary scientific monitoring tools established by the EU to support the CFP through systematic data collection in the fisheries sector. The DCF was introduced in 2000 (Council Regulation (EC) No 1543/2000) <sup>(18)</sup>, implemented in 2002 and revised in later CFP reforms during 2017 in response to evolving policy requirements (Council Regulation (EU) No 2017/1004) <sup>(19)</sup>. The DCF mandates Member States to collect biological, technical, environmental, and socio-economic data on fisheries, aquaculture and fish processing in line with national work plans. The current DCF is more end-users driven and has evolved to more regional harmonisation of the data collection creating **Regional Coordination Groups (RCGs)** <sup>(20)</sup>, composed of experts including national correspondents, end-users and representatives from the Commission, appointed by each Member State.

DCF data are assessed by experts of the **Scientific, Technical and Economic Committee for Fisheries (STECF)** to evaluate fleet capacity, the status of stocks in the Mediterranean and Black Seas, and socio-economic performance. As key CFP scientific advisory body, STECF provides independent scientific advice and technical expertise to the EC. Similarly, the **International Council for the Exploration of the Sea (ICES)** provides scientific advice on the status of 200-250 fish stocks in the Northeast Atlantic and Baltic Sea, which is used by the Commission for its proposal to Member States during the EU's AGRIFISH Council each year to set up the fishing opportunities for the sector in the coming years. Both STECF and ICES bring together independent scientific experts to provide the best available scientific advice to decision-makers under the CFP and the MSFD, with ongoing efforts to deliver integrated ecosystem advice.

---

<sup>(18)</sup> OJ L 176, 15.7.2000, ELI: <http://data.europa.eu/eli/reg/2000/1543/oj>

<sup>(19)</sup> OJ L 157, 20.6.2017, ELI: <https://eur-lex.europa.eu/eli/reg/2017/1004/oj>

<sup>(20)</sup> Article 9 of Council Regulation (EC) No 2017/1004

By 2030, the EU calls for the **General Fisheries Commission for the Mediterranean (GFCM)** and other institutions, such as the ICES, to present and support the implementation of additional efforts to boost fishing gear selectivity. This consists of developing new and innovative gear techniques to reduce catches of small fish and spatial and temporal-specific measures related to high concentrations of fish below the minimum conservation reference size, as reported in the EU Marine Action Plan (European Commission, 2023b). A summary of their main purpose and evaluation is given in the table below.

**Table 2 – Overview of key EU advisory bodies and scientific monitoring tools within the CFP including their purpose and evaluation**

| Tools and advisory committees                                      | Purpose                                                                                                                                                                  | Evaluation                                                                                                                                                                                                                                                                                                   |
|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data Collection Framework (DCF)                                    | Fisheries-related data collected by Member States serves as basis for evaluation of fishing fleet capacity, stock status and economic performance                        | Crucial data for scientific assessments, including fish stock assessments, fleet performance and socio-economic impacts. Lack of standardisation in data collection among Member States, resource issues, data gaps and delayed reporting diminish its effectiveness (DG MARE, 2012; Belschner et al. 2018). |
| Advisory Councils (AC)                                             | Promote cooperation among stakeholders, support decision-making based on expert input, enhance data collection and address regional issues                               | ACs enable the CFP to draw on the knowledge and experience of all stakeholders (European Commission, 2024a). Involving stakeholders, in particular, ACs, at all stages – from conception to implementation of the measures – is provided for as a guideline for the CFP under Article 3.                     |
| Regional Coordination Groups (RCGs)                                | Promote cooperation among MS within the different regions contributing to the fisheries Data Collection Framework                                                        | The EC supports the MS and the regional coordination groups (RCGs) in implementing the data-collection obligations. As a member of RCGs, the EC participates through expert advice and facilitates the communication among the different stakeholders and end users.                                         |
| Scientific, Technical and Economic Committee for Fisheries (STECF) | Evaluate fleet capacity, the status of stocks in the Mediterranean and Black Seas, and socio-economic performance                                                        | Reports are regarded as authoritative source of scientific advice for EU fisheries policy. Provides consultations on matters related to conservation and management of living marine resources. Produces annual reports on fleet capacity and economic performance of sector.                                |
| General Fisheries Commission of the Mediterranean (GFCM)           | Apply fisheries governance, with the authority to make <a href="#">binding recommendations for fisheries conservation and management and for aquaculture development</a> | The GFCM both coordinates and benefits from the support of initiatives to enhance scientific cooperation and capacity-building among its contracting parties.                                                                                                                                                |
| International Council for the Exploration of the Sea (ICES)        | Provide impartial evidence on the state and sustainable use of our seas and oceans.                                                                                      | Evaluation focuses on providing high-quality scientific advice based on rigorous peer-reviewed benchmarks ensuring sound marine science advice                                                                                                                                                               |

### 2.3.2 Financial instruments for supporting the fleet policy

Over the past three decades, the EU has developed several financial instruments to support the implementation of the CFP. The instruments have evolved in parallel with CFP reforms, shifting from structural support to targeted measures aimed at reducing overcapacity, promoting socio-economic resilience and enhancing long-term environmental sustainability (Gallizioli, 2014).

The **Financial Instrument for Fisheries Guidance (FIFG)** supported the CFP by funding structural measures in fisheries, aquaculture, and related sectors from 1993 to 1999 (Council Regulation (EC) No 2080/93) <sup>(21)</sup> and 2000 to 2006 (Council Regulation (EC) No 1263/1999) <sup>(22)</sup>. FIFG financed multiple MAGPs, primarily targeting fleet restructuring and fishing effort reduction through permanent cessation premiums, aid for scrapping vessels, and joint enterprises (Lagares & Ordaz, 2014). However, grants for vessel renewal and modernisation often increased fishing efficiency due to technological advancements and thereby contributed unintentionally to the problem of overcapacity (Hegland and Raakjær, 2008).

The **European Fisheries Fund (EFF)** was a key financial instrument from 2007 to 2013 aimed to support the sustainable development of the EU fishing industry, fishing areas and inland fishing (Council Regulation (EC) No 1198/2006) <sup>(23)</sup>. The EFF set five priorities eligible for funding: 1) fleet adaptation, 2) aquaculture, inland fishing, processing and marketing, 3) collective actions, 4) sustainable development of fishing areas, and 5) technical assistance. As part of the CFP reform, subsidies for the construction of new vessels ended (Article 25). Instead, public support was provided for temporary or permanent cessation of fishing (Articles 23 and 24). The EFF also funded socio-economic measures such as early retirement, retraining programs, and job diversification for fishers (Article 27). While temporary cessation aid was effective, uptake of exit schemes remained limited (Gallizioli, 2014).

The EFF was replaced by the **European Maritime and Fisheries Fund (EMFF)** which operated from 2014 to 2020 (Council Regulation (EU) No 508/2014) <sup>(24)</sup>. The fund was managed partly by the EC to support EU-wide objectives in coastal and maritime affairs (11%) and partly by Member States to fund operational programmes (89%). Financial support was provided either through direct payments to fishers or through funding of scientific research and sustainability projects. Member States could support scrapping schemes for older vessels, with

---

<sup>(21)</sup> OJ L 193, 31.7.1993, ELI: <https://eur-lex.europa.eu/eli/reg/1993/2080/oj>

<sup>(22)</sup> OJ L 161, 26.6.1999, ELI: <http://data.europa.eu/eli/reg/1999/1263/oj>

<sup>(23)</sup> OJ L 223, 15.8.2006, ELI: <https://eur-lex.europa.eu/eli/reg/2006/1198/oj>

<sup>(24)</sup> OJ L 149, 20.5.2014, ELI: <https://eur-lex.europa.eu/eli/reg/2014/508/oj>

aid for cessation and engine upgrades capped at EUR 6 million or 15% of a Member State's allocation.

The **European Maritime, Fisheries and Aquaculture Fund (EMFAF)** (Council Regulation (EU) No 2021/1139) <sup>(25)</sup>, established for 2021-2027, is the current financial instrument designed to support the CFP's objectives. EMFAF aligns with the Multiannual Financial Framework (Council Regulation (EU and Euratom) 2020/2093) and has a EUR 6.108 billion budget to fund projects contributing to the sustainable management and exploitation of aquatic or marine resources. EMFAF also supports fleet energy transition, overcapacity reduction, and modernisation particularly for small-scale fleets and aquaculture, data collection, and may compensate for temporary or permanent cessation.

---

<sup>(25)</sup> OJ L 247, 13.7.2021, ELI: <https://eur-lex.europa.eu/eli/reg/2021/1139/oj>

## 3 State of play of the EU fishing fleet capacity and fleet mapping

The objective of this section is to provide an overview of the main trends of imbalance in the EU fishing fleet, such as where it occurs; which main fleet segments are affected; and reasons underlying the overcapacity.

### 3.1 EU Fleet Capacity Management

It is assumed that a stable, long-term and sustainable balance between the fishing capacity and fishing opportunities could be ensured through the management of fishing fleet capacity expressed in gross tonnage (GT) and kilowatts (kW). Gross tonnage, as defined by Council Regulation (EC) 3259/94 <sup>(26)</sup> repealed by Regulation (EU) 2017/1130 <sup>(27)</sup>, after the 1969 Convention <sup>(28)</sup>, is measured as the internal volume of a water-going vessel measured from keel to funnel and from bow to stern. In addition, kilowatts define the unit of mechanical engine power following the definition consolidated in Regulation (EU) 2017/1130 (Article 5) <sup>(29)</sup>.

Every EU coastal Member State has a fishing fleet capacity ceiling based on GT and kW. Since 2014, the fleet capacity ceilings for EU's Member States have been kept stable or have decreased through the entry/exit system established under Article 23 of the 2013 CFP. This system only allows the addition of new capacity without public aid if it is compensated by the prior withdrawal, without public aid, of at least the same amount of capacity. In practice, this may lead to several vessels replacing one vessel, or one vessel replacing several. Overall, the overall capacity of the EU fishing fleet has decreased since 2014.

The entry/exit scheme was evaluated in 2018 (European Commission, 2019a) as required by Article 23(3) of the 2013 CFP. The evaluation found that, since 2003, in the Northeast Atlantic and for the external fleet, a substantial proportion (≈

---

<sup>(26)</sup> OJ L 339, 29.12.1994, ELI: <http://data.europa.eu/eli/reg/1994/3259/oj>

<sup>(27)</sup> OJ L 169, 30.6.2017, ELI: <http://data.europa.eu/eli/reg/2017/1130/oj>

<sup>(28)</sup> The International Convention on Tonnage Measurement of Ships, held in London on 23<sup>rd</sup> June 1969 (1969 Convention), established the first universal system for calculating ship tonnage (Gross and Net Tonnage) based on enclosed volume, replacing varied national methods for ships in international trade, providing uniformity for dues and safety regulations, and entering into force on 18<sup>th</sup> July 1982.

<sup>(29)</sup> The continuous engine power shall be determined in accordance with the requirements adopted by the International Organization for Standardization in its recommended International Standard ISO 3046/1, 5<sup>th</sup> edition, May 2002 (<https://www.iso.org/standard/28330.html>).

45%) of capacity reduction was attributable to operators (capacity withdrawn and not yet replaced), driven largely by access conditions to available fishing opportunities. Because operators in the Northeast Atlantic have voluntarily chosen to withdraw some capacity, there is a dormant “virtual capacity” that could potentially be reactivated, as long as they also acquire fishing rights.

In contrast, most capacity reductions in the Mediterranean and Black Seas have been driven by permanent cessation measures ( $\approx 90\%$  in GT and  $\approx 75\%$  in kW). Most of the capacity reduced in this region cannot be reactivated, as it was removed with public aid. However, this does not exclude the possibility that part of the capacity in the Mediterranean and Black Seas could still be mobilised again. For example, the Italian fleet's capacity decreased steadily from 2018 to 2023 without public aid (source: 2023 FDI data). In Italy, this ‘virtual capacity’ (removed without public aid) is 14,865 GT representing 11% of GT (source Italian Fleet Report 2024).

The **EU Fleet Register** (Article 24, 2013 CFP) is a public database containing information on all EU fishing vessels, including those flying the flag of an EU country <sup>(30)</sup> (Table 3). Data in the Fleet Register can be classified in three categories: (1) administrative identifications (e.g. vessel name, registration port); (2) technical characteristics (e.g. length, tonnage, fishing gear, power); and (3) historical events (e.g. modifications of characteristics, entry into and exit from fleet). Member States are also responsible for sending to the Commission, by 31<sup>st</sup> May each year, **Fleet capacity reports** (Article 22, 2013 CFP) on the balance between the fishing capacity of their fleets and their fishing opportunities <sup>(31)</sup>.

**Table 3 – Overview of key fleet capacity management tools within the CFP including their purpose and evaluation**

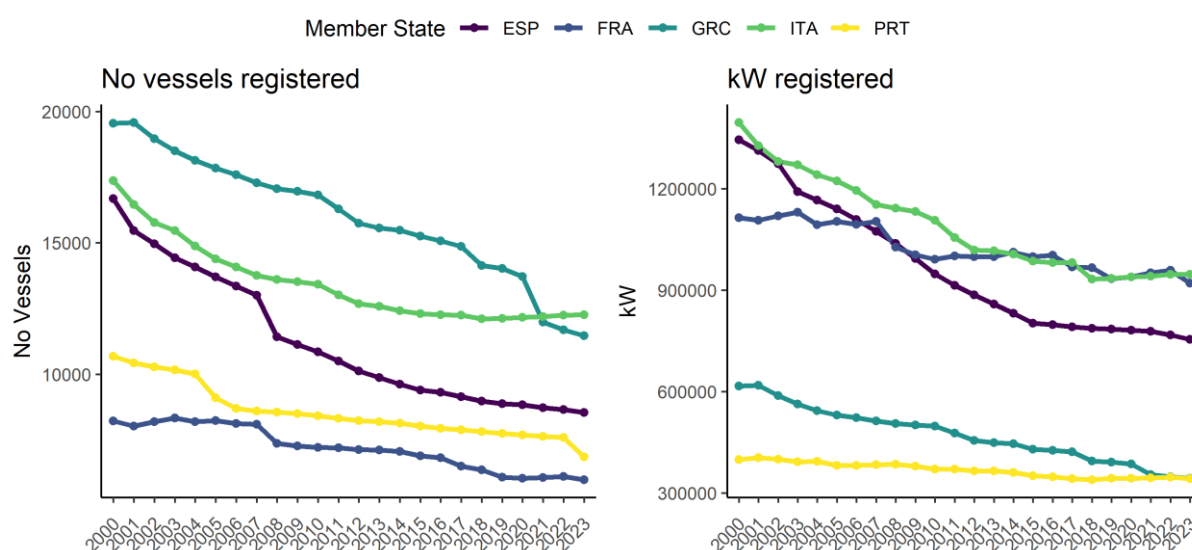
| Tool                         | Purpose                                                                                                            | Evaluation                                                                                                                                                    |
|------------------------------|--------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>EU Fleet Register</b>     | Database to monitor compliance with fleet capacity ceilings set by CFP.                                            | Effective in tracking size and structure of fleet. Concerns on accuracy of reported data impairing overcapacity assessments.                                  |
| <b>Fleet Capacity Report</b> | Annual reports submitted by Member State serve as basis for assessing their compliance with fleet capacity limits. | Useful in identifying overcapacity in specific fleet segments. Political challenges and socio-economic concerns can weaken impact on actual fleet reductions. |

<sup>(30)</sup> [https://webgate.ec.europa.eu/fleet-europa/index\\_en](https://webgate.ec.europa.eu/fleet-europa/index_en)

<sup>(31)</sup> [https://oceans-and-fisheries.ec.europa.eu/fisheries/rules/fishing-fleet-capacities/fleet-capacity-reports-2024\\_en](https://oceans-and-fisheries.ec.europa.eu/fisheries/rules/fishing-fleet-capacities/fleet-capacity-reports-2024_en)

The EU Fleet Register is regularly updated <sup>(32)</sup> and serves as a key tool for monitoring how Member States implement fleet capacity management (Figure 1). Member States must inform the EU of any changes to a vessel's status, such as whether it has been scrapped or modified. Based on these declarations, the total fleet capacity can be calculated per country. Fleet capacity per Member State is then deduced from the register by summing up across all registered vessels (Table 4).

**Figure 1 – Registered vessels in the EU Fleet Register on the 31<sup>st</sup> of December each year for the top five Member States in terms of (left) Number of vessels registered, and (right) kW**



The accuracy of the EU Fleet Register depends on the information provided by Member States. However, the reliability in reflecting the actual fishing capacity has been questioned. For example, a lack of compliance with declared engine power was highlighted in a 2019 EC study (European Commission, 2019b). Uncertainties also remain regarding additional power installed on board that is not used for propulsion ("auxiliary engines"), as its declaration is optional. Such additional power, if not accounted as fishing capacity, is likely to contribute to the vessel's overall harvesting capacity (see Section 7).

In addition, to provide a quantitative overview of the current EU fishing capacity across all 22 coastal Member States, it is necessary to disaggregate the overall fishing fleet capacity by country and by the main type of species fished (i.e. by "fishery", as defined as a grouping of coherent species assemblages targeted by a fleet). Our analysis will use the EU Fleet Register and link it to the best available

<sup>(32)</sup> Regulation (EU) 2017/218: "MS shall submit to the Commission any event (...) no later than at the end of the working day when the event has been fully registered".



fisheries data and regional data warehouses (e.g. ICES, GFCM) <sup>(33)</sup><sup>(34)</sup>, as described further below.

**Table 4 – Mapping fleet capacity as extracted from the EU Fleet Register (records up to the 1<sup>st</sup> of January 2024)**

| Country                           | Number of Fishing Vessels | Total Capacity: Tonnage (GT) | Total Capacity: Power (KW) |
|-----------------------------------|---------------------------|------------------------------|----------------------------|
| <a href="#">BEL - Belgium</a>     | 60                        | 13 697.00                    | 44 312.00                  |
| <a href="#">BGR - Bulgaria</a>    | 1 777                     | 5 847.70                     | 52 211.33                  |
| <a href="#">CYP - Cyprus</a>      | 818                       | 3 893.49                     | 39 974.75                  |
| <a href="#">DEU - Germany</a>     | 1 138                     | 56 238.00                    | 125 142.00                 |
| <a href="#">DNK - Denmark</a>     | 1 777                     | 65 218.64                    | 200 014.30                 |
| <a href="#">ESP - Spain</a>       | 8 548                     | 314 676.17                   | 755 227.50                 |
| <a href="#">EST - Estonia</a>     | 2 035                     | 16 206.26                    | 49 264.57                  |
| <a href="#">FIN - Finland</a>     | 3 227                     | 14 998.15                    | 172 096.97                 |
| <a href="#">FRA - France</a>      | 5 993                     | 157 629.33                   | 920 273.00                 |
| <a href="#">GRC - Greece</a>      | 11 465                    | 59 931.80                    | 343 405.22                 |
| <a href="#">HRV - Croatia</a>     | 7 320                     | 42 016.98                    | 338 402.86                 |
| <a href="#">IRL - Ireland</a>     | 1 935                     | 59 807.92                    | 167 928.06                 |
| <a href="#">ITA - Italy</a>       | 12 264                    | 146 254.79                   | 948 169.31                 |
| <a href="#">LTU - Lithuania</a>   | 117                       | 32 535.25                    | 37 477.19                  |
| <a href="#">LVA - Latvia</a>      | 662                       | 22 058.29                    | 39 183.60                  |
| <a href="#">MLT - Malta</a>       | 832                       | 6 520.89                     | 69 050.29                  |
| <a href="#">NLD - Netherlands</a> | 659                       | 82 674.00                    | 190 657.75                 |
| <a href="#">POL - Poland</a>      | 824                       | 35 476.30                    | 83 871.02                  |
| <a href="#">PRT - Portugal</a>    | 6 854                     | 84 807.48                    | 342 978.06                 |
| <a href="#">ROU - Romania</a>     | 174                       | 1 634.01                     | 6 348.56                   |
| <a href="#">SVN - Slovenia</a>    | 136                       | 668.37                       | 8 760.21                   |
| <a href="#">SWE - Sweden</a>      | 957                       | 24 167.28                    | 130 664.62                 |

Source: [https://webgate.ec.europa.eu/fleet-europa/stat\\_glimpse\\_en](https://webgate.ec.europa.eu/fleet-europa/stat_glimpse_en)

### 3.2 Status of the EU fishing capacity measured with kW and GT

As the fishing fleet capacity of the Member State is regulated by fishing capacity ceilings and the entry/exit scheme (Article 23, 2013 CFP), a new vessel can only enter a fleet after the equivalent amount of fishing capacity (in kW and GT) is removed from the same fleet. No extra capacity can be introduced unless a

<sup>(33)</sup> <https://www.ices.dk/data/Pages/default.aspx>

<sup>(34)</sup> <https://www.fao.org/gfcm/data/en/>

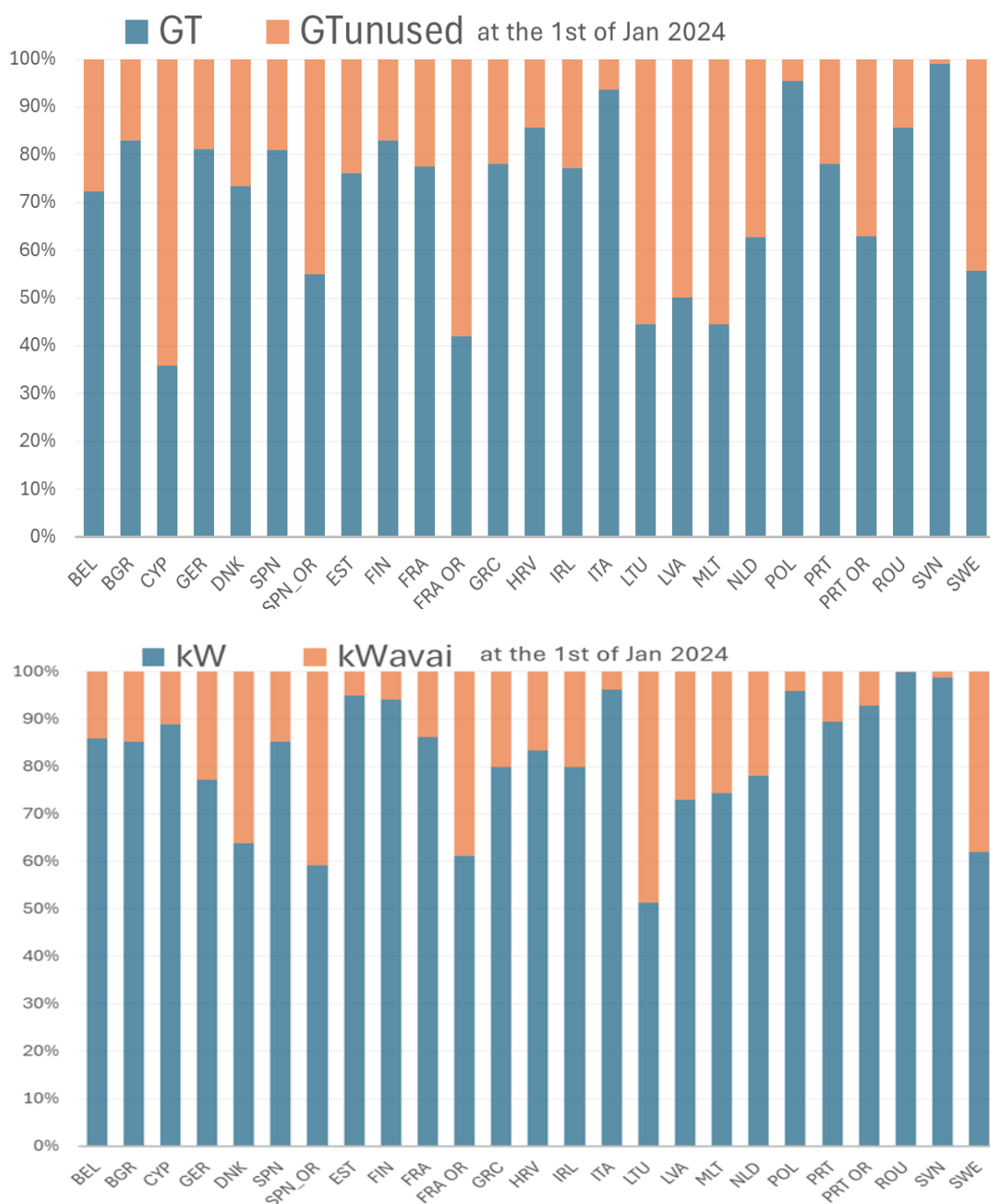
vessel applies to the EMFAF fund to improve safety, working conditions or energy efficiency (see Section 6.1). All 22 coastal Member States have shown an annual decrease in both GT and kW since the year 2000 (or since their respective date of entry to the EU), with the withdrawn capacity not being replaced. Overall reductions of between 30% and 40% have been observed for Spain, France and Italy since the year 2000 to the present. This has led to a gradual widening of the gap between actual GT and GT ceilings (Figure 2).

Despite the reduction in absolute value of the fishing fleet capacity, expressed in kW and GT, numerous cases of imbalance between fleet and fishing opportunities have been reported over the same period (see Section 4 for review). Hence, the observed decrease in EU fishing fleet capacity (by means of total kW and GT) did not translate into an overall balanced capacity with the available fishing opportunities. This is likely due to a change in fleet composition (vessel size and age), the status of fish stocks and a decline in stocks faster than the fishing capacity reduction, and/or not preventing a concomitant increase in the harvesting capacity (i.e. “ability to catch fish”) of the EU fleet.

The fishing fleet capacity in terms of kW and GT, as well as vessel size (length overall, LOA, in metres) and vessel age is presented by country from the EU Fleet Register (see Table 31 in Annex 1). It shows that Spain and France in Northeast Atlantic (FAO 27 area), and Italy in the Mediterranean Sea (FAO 37 area covering the Western Mediterranean Sea, the Central Mediterranean Sea, the Adriatic Sea and the Eastern Mediterranean) are the countries contributing the most to the total European kW and GT. There are also regional variations in the main fishing gear used by vessels (e.g. pelagic gears in northern EU, longlining in southern EU), as well as in vessel age and average length of vessels.

The capacity metrics declared in the fleet register are aggregated and reported in the STECF Fisheries Dependent Information (FDI) database covering all EU waters. Such aggregation at the DCF fleet segment level can be used to map the capacity further down to the DCF segments used in the FDI. In addition, it is also possible to link the species landed, as reported in the FDI, to their stock status (e.g.  $F/F_{MSY}$ ), as monitored by the STECF. This linkage makes it possible to map the total level of kW and GT associated with fisheries directed toward stocks that are fished unsustainably or toward stocks that are fished sustainably across the North Atlantic Ocean (NAO) and Mediterranean and Black Sea (MBS) ecoregions (see Figure 3 and Figure 4). Based on those visuals, there seem to be some areas with a large amount of fishing capacity directed toward stocks fished unsustainably (Figure 3), while other areas show substantial capacity targeting stocks fished sustainably (Figure 4).

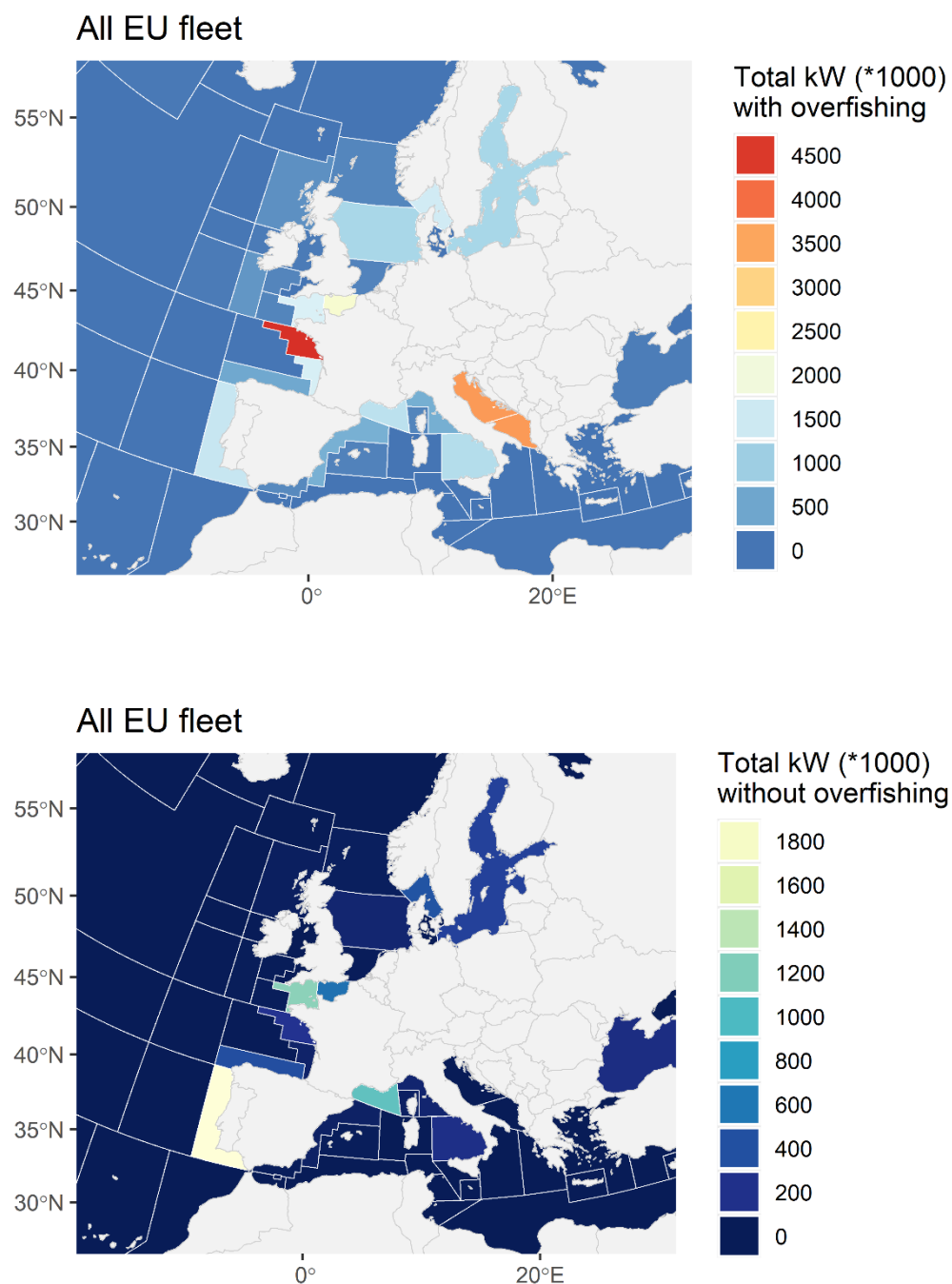
**Figure 2 – Proportion of Gross tonnage GT (GT) or kW and unused tonnage (GTunused) or unused kW (kW Unused) left under the country-specific capacity ceilings as per 1<sup>st</sup> of January 2024**



Source: Own elaboration

Note that the GT (or kW) ceiling for a specific country equals the GT (or kW) plus the unused GT (or kW) for that country

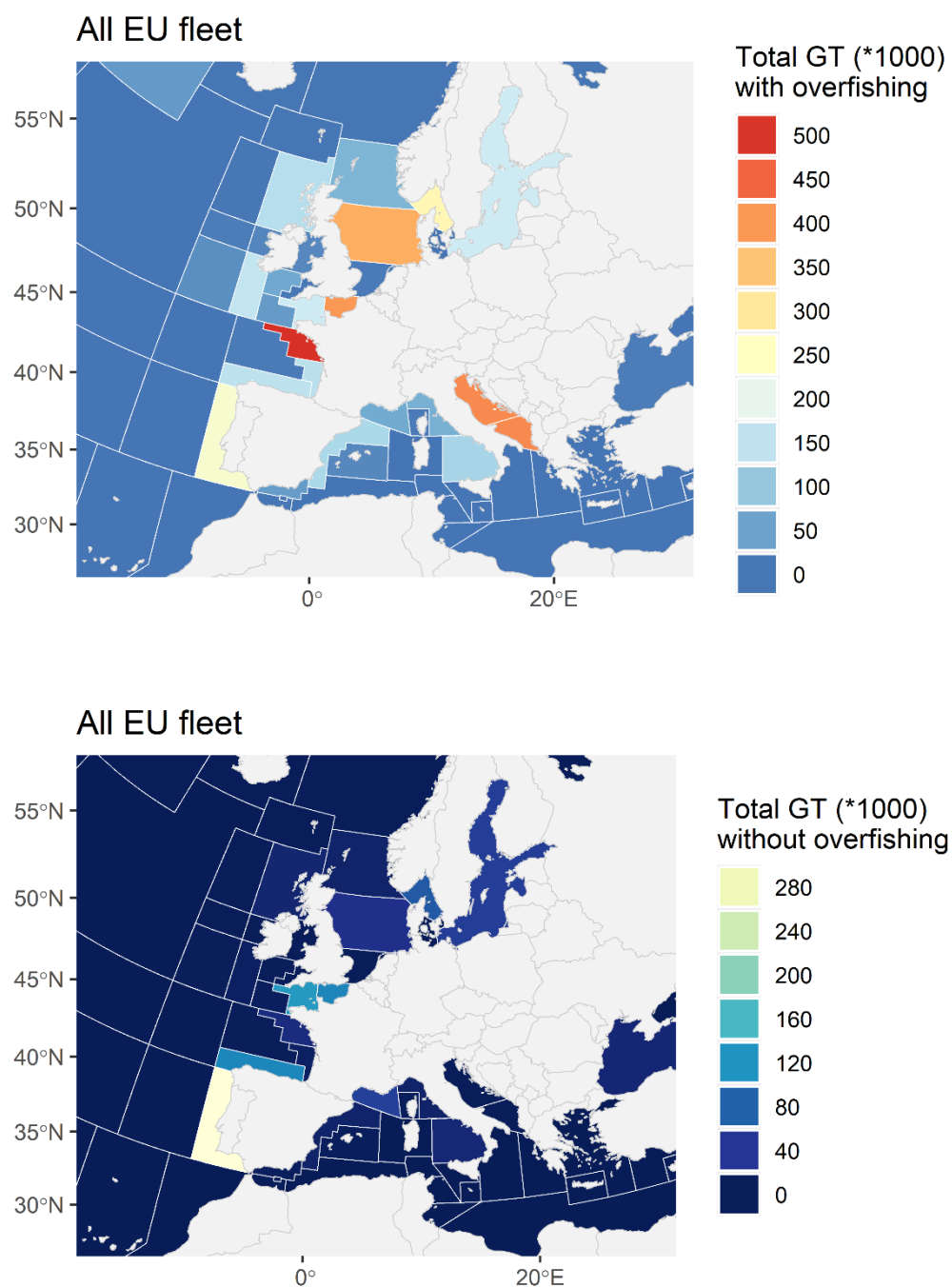
**Figure 3 – Mapping the kW of the EU fleet across FAO areas within the NAO and MBS ecoregions**



Source: Own elaboration

Data obtained from the coupling of FDI Capacity data for the 22 coastal Member States to the JRC datasets used in the STECF ad-hoc monitoring of the CFP evaluation. Top – total kW associated with overfishing, bottom – total kW associated with stocks fished sustainably. Finland excluded due to lack of FDI reported data

**Figure 4 – Mapping the GT of the EU fleet across FAO areas within the NAO and MBS ecoregions**



Source: Own elaboration

Data obtained from the coupling of FDI Capacity data for the 22 coastal Member States to the JRC datasets used in the STECF ad-hoc monitoring of the CFP evaluation. Top – total GT associated with overfishing, bottom – total GT associated with stocks fished sustainably. Finland excluded due to lack of FDI reported data.

### 3.3 Mapping the EU Fishing Capacity per fishery

The overall EU fishing capacity can be disaggregated to a level that shows the fishing capacity per type of fishery (i.e. combination of a fishing area, an assemblage of targeted species, and a type of fishing gear used) across EU sea basins. A breakdown of overall fishing capacity by fishery across all 22 coastal Member States is possible when the Fleet Register is linked to DCF fleet segments and is further related to the individual stocks fished by each segment, where the status of those stocks is known. This breakdown in DCF fleet segments, at a finer level than that defined by the EC 2014 guidelines (COM (2014) 545 final), gives the proportion of each Member State's capacity directed toward fishing sustainably (i.e. in balance with fishing opportunities). Furthermore, this helps to characterise the possible dependency of various fleet segment's fishing capacity on overfished stocks.

Fisheries currently identified by fishing area, target species and type of fishing gear may represent the most suitable level for implementing capacity and effort limitations based on fishing techniques. For example, if the segment definitions remain too broad (i.e. defining segments that are engaged in several different fisheries, as with the current DCF segment definition described in EC 2014 guidelines), fisheries managers would be unable to identify which proportion of capacity within each segment is excessive, or the reasons for this excess. This could lead to requesting action plans on already balanced fisheries.

By managing fishing capacity per fishery as outlined above, each fishery might ultimately be individually authorised with a maximum capacity allocated to clearly defined fishing activities. Such an alternative segmentation in managing fleet capacity would, however, call for a standardisation of capacity units so that comparison among fisheries would account for differential catching power.

#### 3.3.1 Disaggregating and standardising fishing fleet capacity into fisheries-related capacity

The EU Fleet Register (Commission Regulation (EC) No 26/2004 <sup>(35)</sup>, repealed by 2017/218 <sup>(36)</sup>), which provides the number of vessels and kW, GT, LOA and vessel age by registration port, can be mapped per DCF fleet segment alongside the dominant activity of a vessel, as described in Table 8 of DCF (Commission Delegated Decision (EU) 2021/1167) <sup>(37)</sup>. The register is integrated with EU fisheries-related datasets to assess and provide a detailed summary of the

---

<sup>(35)</sup> OJ L 5, 9.1.2004, ELI: <https://eur-lex.europa.eu/eli/reg/2004/26/oj>

<sup>(36)</sup> OJ L 34, 09.02.2017, ELI: [http://data.europa.eu/eli/reg\\_impl/2017/218/oj](http://data.europa.eu/eli/reg_impl/2017/218/oj)

<sup>(37)</sup> OJ L 253, 16.7.2021, ELI: [http://data.europa.eu/eli/dec\\_del/2021/1167/oj](http://data.europa.eu/eli/dec_del/2021/1167/oj)

present and historical (i.e. 2015-2023) fishing capacity in each fishery at the data resolution of DCF Level 6 (a combination of a gear type, a target assemblage, and a mesh size and other selective devices, as described in Table 5 of (EU) 2021/1167). Obtaining fisheries descriptions down to a finer level has not been possible as it would require analysing species composition and logbook/FDI catch data and the involvement of Member State experts in streamlining and validating such calculations. A summary of the different levels of fishing fleet segmentation for describing EU fleet capacity is shown in Table 5 below.

**Table 5 – Different levels of fishing fleet segmentations for describing the EU fleet capacity**

| Source                             | Fleet segmentation                                                                                | Remark                                                                                                                                                                                                                                                                                                            |
|------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EU Fleet Register                  | Main and secondary gears                                                                          | Currently reported as stipulated by Commission Regulation (EU) 2017/218. Currently used to map the EU Fleet capacity <sup>(38)</sup> . Includes fleet capacity metrics kW, GT, kWAux (kW auxiliary), GT_s (GT safety), LOA, and vessel age, each vessel being attached to a port of registration ("home harbour") |
| STECF Annual Economic Report (AER) | A combination of country, vessel size category, and fishing technique                             | AER data call to Member State (publicly available)                                                                                                                                                                                                                                                                |
| EU DCF/STECF FDI                   | A combination of vessel size category, fishing gear type, target assemblage, and mesh size        | FDI data call to Member State (confidential to STECF)                                                                                                                                                                                                                                                             |
| EU Regional data warehouse         | A combination of vessel size category, target assemblage fishing gear, mesh size (EU DCF Level 6) | ICES data call to Member State for RDBES in the NEA (confidential to ICES)                                                                                                                                                                                                                                        |
| National logbooks                  | Individual vessel                                                                                 | Confidential as owned by Member State                                                                                                                                                                                                                                                                             |
| Broader segmentation               | Deduced from grouping Level 6 occurrences                                                         | More workable                                                                                                                                                                                                                                                                                                     |

The adopted approach in this study is to use the registration port or the port of landings, as reported in the EU Fleet Register, to disaggregate economic activities into fisheries and regions.

The landing port within the EU Fleet Register is used as a proxy to attach landing values and/or other economic and social indicators collected by the EU DCF. This coupled dataset consists of listing records on Vessel ID / kW / GT / LOA / Age / Landing Harbour / DCF Level 6 / Region / Days at Sea / kW Day / GT Day, therefore characterising individual capacity and effort metrics within the same dataset.

<sup>(38)</sup> See [https://webgate.ec.europa.eu/fleet-europa/index\\_enfor](https://webgate.ec.europa.eu/fleet-europa/index_enfor)



In this endeavour a strong assumption was to ignore that, in some occurrences, the location of the landing port does not necessarily directly relate to the region where the economic activity is generated. Given the data segmentation level available for this study, there was no way to correct for this assumption, as it requires access to national data that are not collected within this project.

Another major shortcoming is that the presence of a vessel in the EU Fleet Register does not mean that it is actively engaged in fishing activity in the recorded year. Hence, the fleet capacity measured in this way is likely overestimating the active fleet capacity (when compared to the STECF Balance Capacity Vessel Utilisation Ratio (VUR) indicator, which identifies only active vessels; STECF, 2024a), while at the same time underestimating the capacity reduction required to achieve balance, given that the existing active capacity is more efficient than expected.

A source for geo-localised capacity, effort and landings data is the RDBES (Regional Database and Estimation System) database in the North Atlantic Ocean (NAO) area within the EU waters, which is owned by ICES. The RDBES data call 2023 to Member States can be found online <sup>(39)</sup>. The RDBES database conveniently gathers the landings and effort declaration per DCF fleet segmentation Level 6 and landing harbours, which Member States submit to ICES ahead of running the stock assessment in the NAO. The RDBES includes the information required to associate geographical land-based ports with marine-based fishing activity and landing location and to provide further understanding and insight into the cross-ecoregional dependence of fisheries. However, landings data are aggregated by national institutes per harbour before uploading to the RDBES according to the data model. Therefore, the vessel and gear characteristics behind the aggregation are not known from this dataset alone.

In the Mediterranean and Black Seas area, the FDI data might be used to map the fleet capacity of the EU Fleet Register per country and DCF Level 6, but such capacity is only related to Geographical Sub-Area (GSA) information, as information on landing ports is not available in the FDI dataset. Such information might be ultimately retrieved in the more complete Integrated Fisheries Information System for the Mediterranean and Black Sea (RDBFIS) <sup>(40)</sup> which is under development. This study did not pursue disaggregating fleet capacity in the MBS to fisheries level given the lack of proper data to do so at the time of the study.

---

<sup>(39)</sup> <https://doi.org/10.17895/ices.pub.23623179>

<sup>(40)</sup> <https://medbsrdb.eu/>

### 3.3.2 Linking fleet capacity metrics to stock status

Landing records from the RDBES database were further assigned to a particular fish stock using a separate lookup table for linking ICES fish stocks to species-area combinations <sup>(41)</sup>. This makes it possible to aggregate the coupled data per ICES stock and link the landing records to the related ICES stock assessment data (assessed biomasses, recruitment, and fishing pressure (fishing mortality,  $F$ )). The coupling to the EU Fleet Register was done for the 2021-2023 period. By linking fishing pressure estimated from the stock assessment database, which provides the ratios of the current fishing mortality ( $F$ ) to target fishing mortality ( $F_{MSY}$ ) for all assessed stocks ( $F/F_{MSY}$ ), all RDBES catch records were characterised to indicate whether the reported landings and effort corresponded to catches from sustainably harvested stocks (i.e.  $F/F_{MSY} < 1$ ) <sup>(42)</sup> or, conversely, from stocks under overfishing (i.e.  $F/F_{MSY} > 1$ ). If no  $F_{MSY}$  is defined the analysis looked at other reference points such as  $B < B_{lim}$  or  $B < B_{MSYtrigger}$ . The stocks with no reference points are dismissed (152 out of 204 stocks with catches in the NAO).

The RDBES comes with two separate tables for landings and effort data. This study merges the landings and effort tables per country, year, métier Level 6, landing location, and vessel length category. Total effort in days at sea recorded in the RDBES per fleet segment is then aggregated per harbour and linked to the harbour registered in the EU Fleet Register (UN/LOCODE harbour location) <sup>(43)</sup>. Such information helps to split the harbour-aggregated fleet capacity metrics into estimates per fleet segment. Such disaggregation enables the fleet capacity to be mapped to a higher level of resolution than the one recorded in the EU Fleet Register, and subsequently to map the percentage of fishing effort made on sustainable stocks (Table 6).

Hence, calculating the fraction of the fishing capacity (effort expressed as thousand kW.days or thousand GT.days summed over 2019-2022, covering only the EU fleet active in Northeast Atlantic) directed to stocks fished sustainably (i.e.  $F/F_{MSY} < 1$ ), or otherwise, shows that 56.6% of kW.days and 59.3% of GT.days has been deployed on sustainable fishing over 2019-2022.

---

<sup>(41)</sup> Given most species distribute over several stocks whenever stocks are defined per catch area. For example, her.27.25-2932 stocks distribute over FAO 27 Baltic subdivisions 25 29, 31 and 32, while it is trivial to say that the herring species is also present outside the Baltic Sea.

<sup>(42)</sup> An indicator of the CFP to report on the progress of achieving the MSY, as stipulated in Article 50 of the Common Fisheries Policy (CFP; Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013).

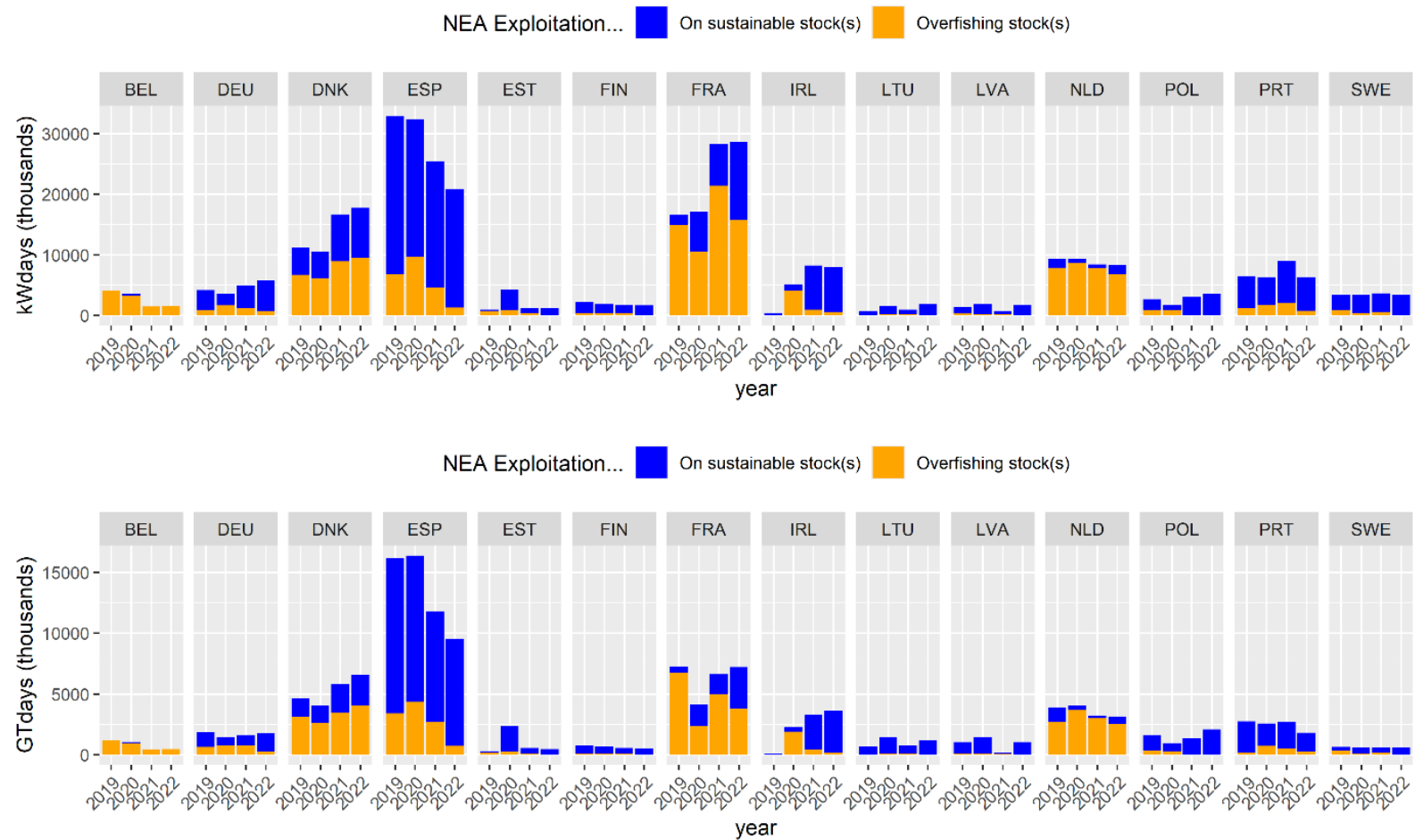
<sup>(43)</sup> <https://unece.org/trade/uncefact/unlocode>

**Table 6 – Percentage of fishing effort (total kW.days and GT.days between 2019-2022, covering only EU fleet active in Northeast Atlantic Ocean) directed towards stocks fished sustainability (i.e.  $F/F_{MSY} < 1$ ), or otherwise**

| Status of the exploitation    | kW.days (0,000s) | GT.days (0,000s) |
|-------------------------------|------------------|------------------|
| On sustainable stocks         | 233 778.6        | 96 062.37        |
| Overfishing stocks            | 179 374.2        | 66 007.76        |
| <b>Percentage sustainable</b> | <b>56.6%</b>     | <b>59.3%</b>     |

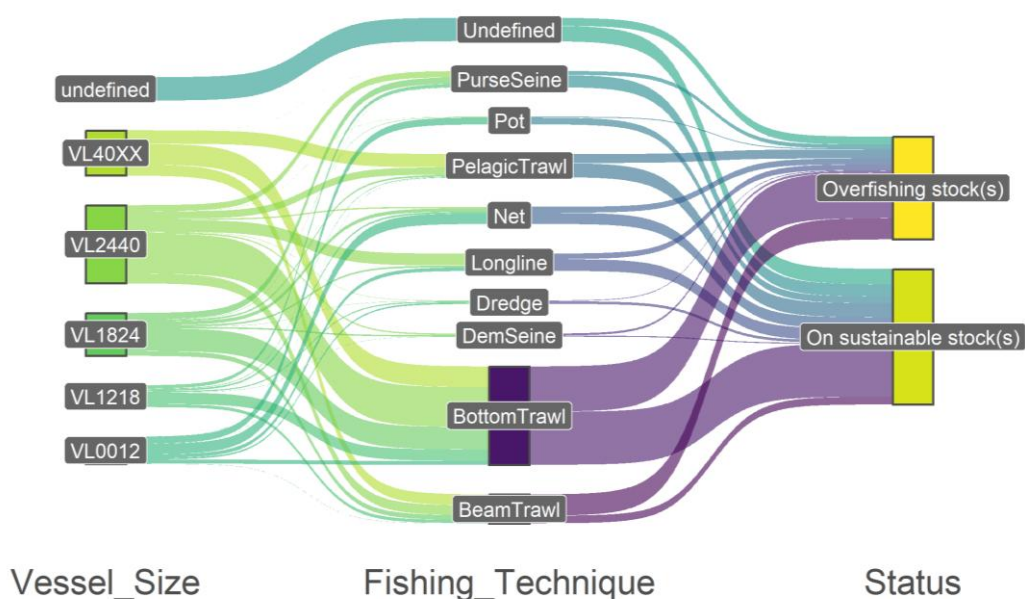
The fishing capacity in terms of kW.days and GT.days applied to the status of fish stocks differed by country (Figure 5), type of fishing techniques and vessel size category (Figure 6 to Figure 8). Hence, in some countries a large proportion of effort has been directed toward sustainably fished stocks (e.g. Spain in the NAO), while others show the opposite pattern (e.g. France in the NAO, Figure 5). About half of the bottom trawling effort (Figure 6) - the gear type with the highest overall effort, particularly in France and Denmark - is directed toward unsustainably fished stocks (Figure 7). A similar patterns is observed for beam trawling in the Netherlands. In contrast, bottom trawling effort in Spain is mostly directed toward sustainably fished stocks. Figure 7 Further decomposition (Figure 8) facilitates this interpretation.

Further analysis at the Annual Economic Report (AER) level, shows this coarser segmentation used to assess the balance of fishing capacity is, most of the time, encapsulating fisheries that target sustainably harvested stocks (if the  $F/F_{MSY}$  ratio were the only criterion to assess sustainability). This holds for fleet segments of vessels larger than 18 m (Figure 9) and less than 18 m (Figure 10). Using a finer segmentation in such evaluation would mean avoiding pooling unsustainable with sustainable fisheries in managing fleet capacity.

**Figure 5 – Country Effort directed towards sustainably vs. unsustainably fished stocks in the Northeast Atlantic Ocean**

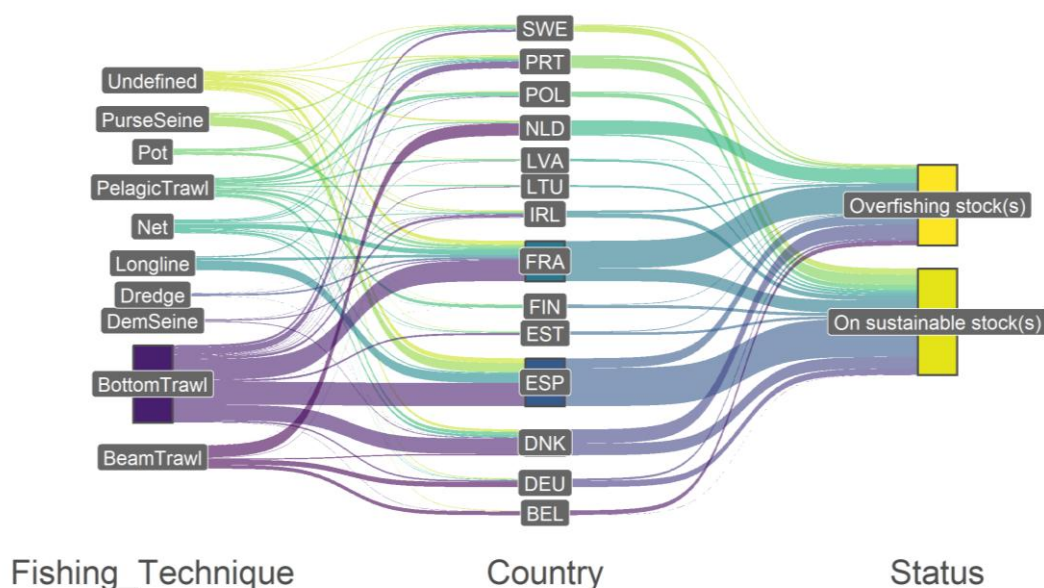
Source: Own elaboration. Effort in kW-days and GT-days estimates for 2019 to 2022 by country, after coupling the EU Fleet Register to the RDBES and stock assessment data in the Northeast Atlantic Ocean

Figure 6 – Partition of fishing capacity between vessel size and fishing techniques used by the EU fleet active in the NAO



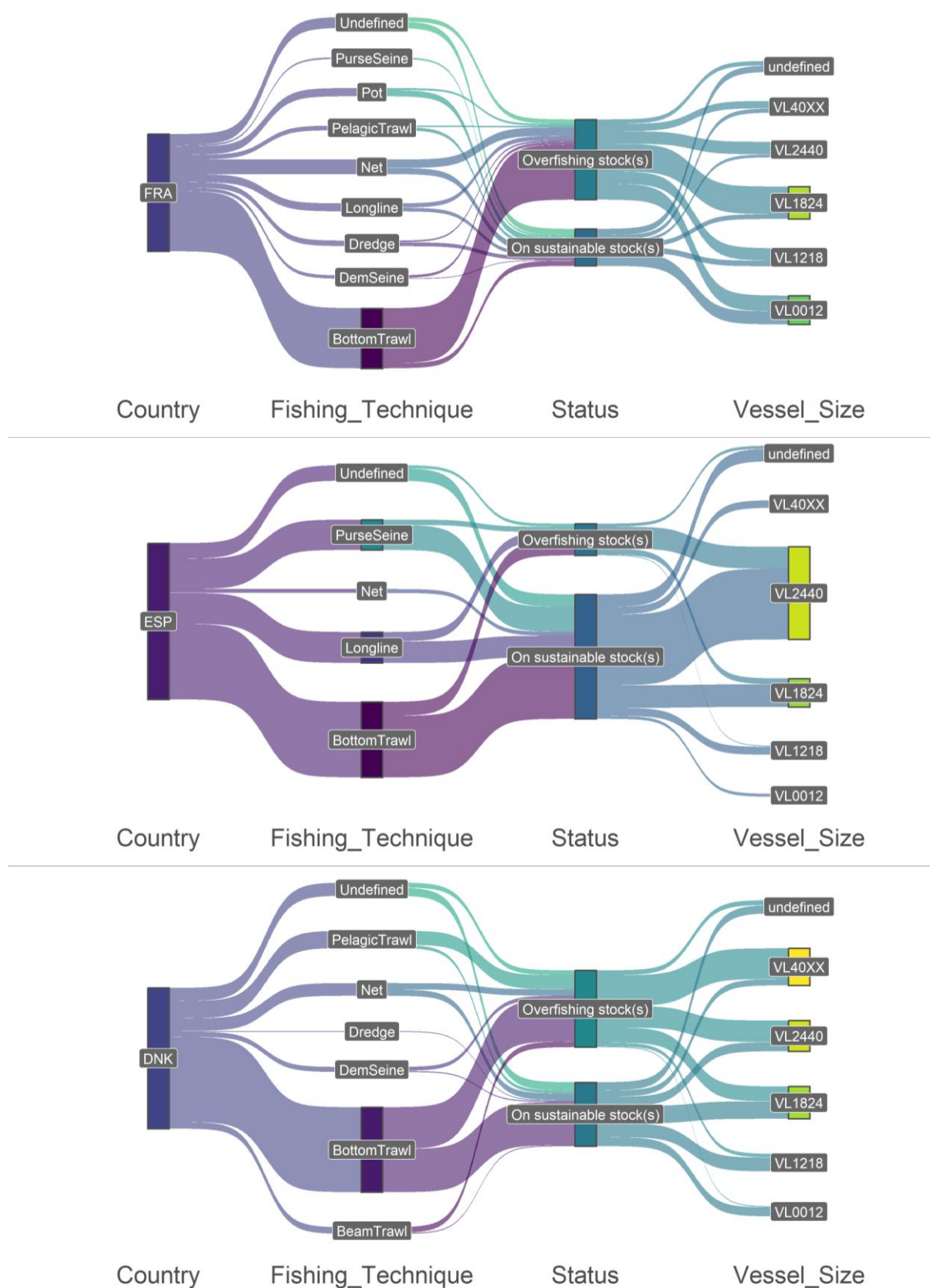
Source: Own elaboration. Sankey plot to visualise the distribution of total kW.days between vessel size category (e.g. VL0012 for vessel length between 0 and 12m, VL40XX for vessels exceeding 40m in length), fishing technique and stock status within Northeast Atlantic region for the period 2019-2022. The width of the links is proportional to the magnitude of kW.days.

Figure 7 – Partition of the fishing capacity between fishing techniques and countries for the EU fleet active in the NAO



Source: Own elaboration. Sankey plot to visualise the distribution of total kW.days between fishing technique, EU Member State and stock status within Northeast Atlantic region for the period 2019-2022. The width of the links is proportional to the magnitude of kW.days.



**Figure 8 – Partition of the fishing capacity for highest 3 countries by catch volume**

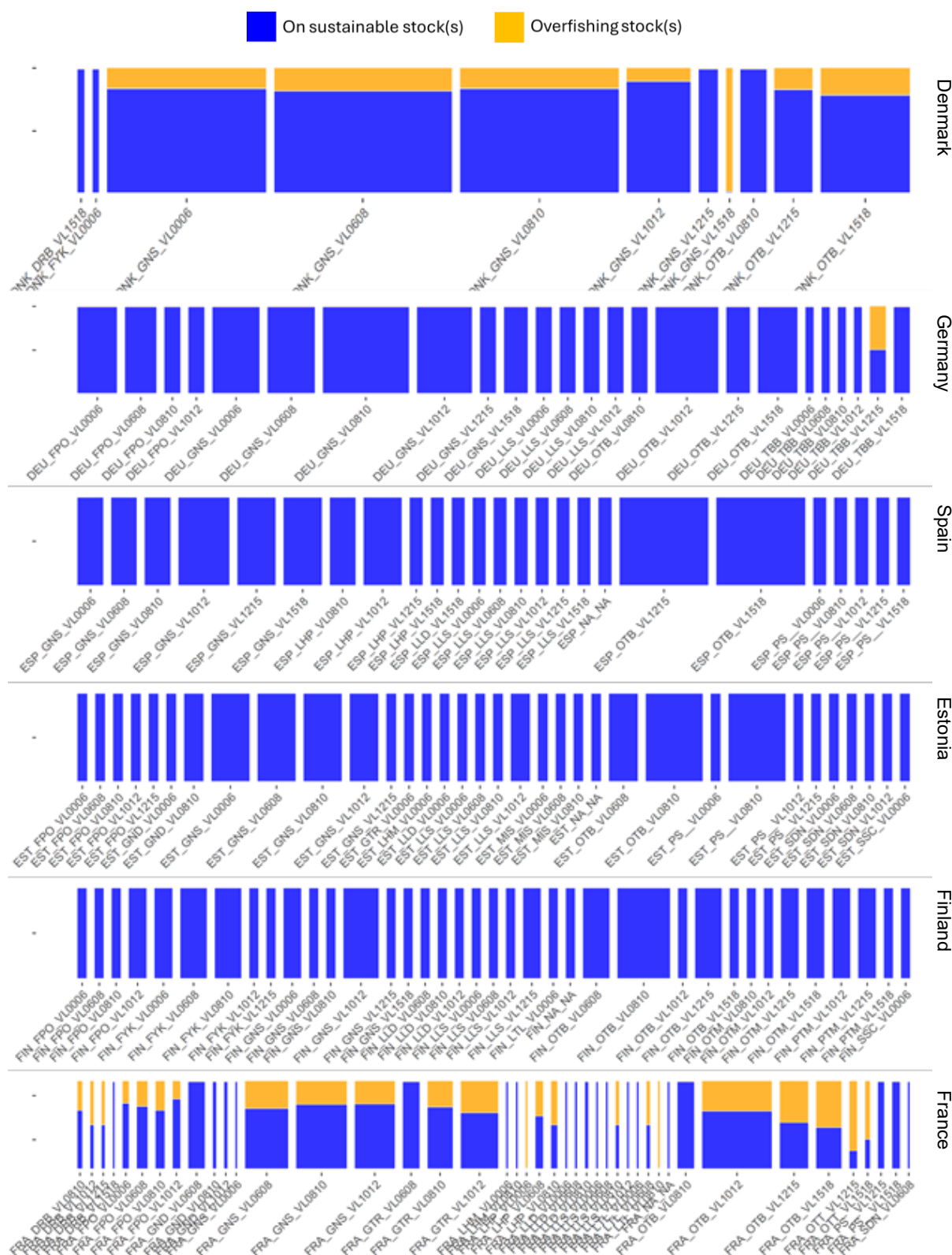
**Source:** Own elaboration. Sankey plot to visualise the distribution of total kW-days for highest 3 countries by catch volume (top: France, middle: Spain, bottom: Denmark) between fishing technique, stock status and vessel size category within Northeast Atlantic Ocean region for the period 2019-2022. The width of the links is proportional to the magnitude of kW.days.

**Figure 9 – Presence of sustainable fisheries within Annual Economic Report coarser segmentation**

Source: Own elaboration





**Figure 10 – Presence of sustainable fisheries within Annual Economic Report coarser segmentation**

AER segments (&lt;18 m only)

Source: Own elaboration. Only segments smaller than 18 m are shown for readability (i.e.  $F/F_{MSY} < 1$ ; note that not all stocks are assessed or have  $F_{MSY}$  reference points)

**Figure 10 (continued) – Presence of sustainable fisheries within Annual Economic Report coarser segmentation**

Source: Own elaboration. Only segments smaller than 18 m are shown for readability (i.e. F/FMSY<1; note that not all stocks are assessed or have FMSY reference points)

## Refining assessment of balance with a fishery-related segmentation

Overall, judging the appropriateness of disaggregating fleet segments at the fishery level, the evaluation of fleet balance with their fishing opportunities requires access to more comprehensive fisheries-related data (i.e. nationally-owned data). This then requires a carefully streamlined data treatment, such as the one developed in this study applied to regional ICES data.

Of course, multiple vessels operating at a fishery level can also participate in other fisheries, each having different economic and technical variables. Aggregating these vessels at a fleet segment level as well as fishery level will mask individual vessel indicators. Therefore, a description of the balance at the fishery level will most likely remain feasible only in relation to the biological indicators (Sustainable Harvest Indicator and Stocks At Risk). On the contrary, of the economic indicators (Return on Investment, Return on Fixed Tangible Assets and Break even ratio) and technical indicators (Inactivity Indicator and Vessel Use Ratio) can be used at a fishery level, if the vessel is used to participate in only a single fishery during that year, which is unlikely. Therefore, **the economic and technical indicators may ultimately only be refined per fishery if a certain vessel is used to participate in only one fishery in the year, which is unlikely.**

Hence, there is a risk that overall fleet capacity subdivided into a sub-segmentation, or too-finely defined categorisations, will create inconsistencies (e.g. capacity not summed up at the DCF level), preventing a comparison and a common level-playing field between Member States. Besides, applying the same workflow as developed here for the NEA (FAO 27 area) to the Mediterranean and Black Sea (FAO 37 area) is not possible, as the only available data to the contractor, which covers all EU waters, is the FDI (confidential data). In the FDI, no landing harbour location is recorded; therefore, merging the dataset can at best be done at the country or GSA level, which does not add useful information for this study.

**Making fleet capacity comparable across segments with a standardisation.** Linking the DCF and EU Fleet Register information to the highest degree segment resolution provides the opportunity to map the fishing capacity per fishery, and not only per primary gear (the only fishery-related mandatory information collated in the EU Fleet Register). Beyond measuring the fishing capacity as such, this linkage provides an opportunity for standardising the registered fishing capacity metrics (kW and GT) to describe relative harvesting capacity (i.e. relative “ability to catch fish”) across fisheries (see Box 1 for description of harvesting capacity).

Standardising the fishing capacity aims to translate nominal fishing capacity into an actual harvesting capacity defined as the “ability to catch fish”. Such a standardisation characterises relative kW and GT among fisheries by calculating catch rates per species caught (kg per hour, kg per kW, or kg per GT) and

geographical area for each fishery. The standardisation may further help capture temporal change in harvesting capacity and correct the nominal fishing capacity accordingly, so that technological development (so-called “technological creep”) is also captured over time.

## 4 Outlook of the EU fleet balance and case studies

This section provides an **overview of the main trends of imbalance in the EU fishing fleet between 2015 and 2023**. The focus is on regions, fisheries and fleet segments <sup>(44)</sup>, that appear to be out of balance with their available fishing opportunities. The overview is based on STECF's assessment of fleet reports submitted by Member States and the relevant GFCM reports (e.g. Working Group on the Management of Fishing Capacity WGCAP, Working Group on Fishing Technology WGFiT, the State of Mediterranean and Black Sea Fisheries SoMFI, and sub-regional committees for the Mediterranean Sea and Black Sea).

The overview identifies where imbalances occur, which fleet segments are affected, and underlying reasons for overcapacity. It also highlights the regions, fisheries, and fleet segments that systematically lack the biological and/or economic data needed to assess balance.

For a better understanding of why fleet imbalance occurs and to identify factors contributing towards this, five case studies were selected from different sea basins and in different fisheries/fleet segments, which appear to be imbalanced for several years.

### 4.1 Balance indicators used to assess EU fleet

EU Member States are required to submit an annual report on fleet balance <sup>(45)</sup>, using guidelines provided by the European Commission. These national fleet capacity reports are reviewed each year by the STECF to assess, for all fleet segments, the balance between fishing capacity and the fishing opportunities available to them.

Commission guidelines COM(2014) 545 final (European Commission, 2014) (and COM(2024) 223 final (European Commission, 2024b) specific to the Outermost regions and further replaced by COM(2025)798 final) provide a standardised approach for assessing the balance between fishing capacity and fishing opportunities over time, in accordance with Article 22 of the 2013 CFP Regulation. These guidelines are used to determine whether fishing fleets depend on overfished stocks or contribute to the depletion of fish stocks that are already at low levels and at risk of not being able to replenish themselves, using

---

(44) Fleet segments are defined in accordance with the segments defined in Appendices II and III of Commission Decision 2010/93/EU adopting a multiannual Community programme for the collection, management and use of data in the fisheries sector for the period 2010-2013. Segments are described by vessel length, primary gear and zone of activity.

(45) Reports can be accessed from European Commission: [https://oceans-and-fisheries.ec.europa.eu/fisheries/rules/fishing-fleet-capacities/fleet-capacity-reports-2023\\_en](https://oceans-and-fisheries.ec.europa.eu/fisheries/rules/fishing-fleet-capacities/fleet-capacity-reports-2023_en)

two biological indicators: the Sustainable Harvest Indicator (SHI), and the Stocks-At-Risk indicator (SAR).

In addition to the biological indicators, the guidelines include economic and technical indicators that are also used to show whether a fleet may be imbalanced. These include indicators for fleet profitability: Return on Investment (RoI), Return on Fixed Tangible Assets (RoFTA) and Ratio Current Revenue and Break-Even Revenue (CR/BER). Another indicator is the level of vessel activity: the Vessel Use Ratio (VUR). Further details of the calculation methods for biological, economic and technical indicators are provided under Sections 10, 11 and 12 respectively in COM(2014) 545 final.

Note that, due to several key differences related to the structure and operation of the EU fleet within the outermost regions <sup>(46)</sup>, in many cases, conducting a balance assessment for these fleets in accordance with COM(2014) 545 final is not possible. In consequence, COM(2024) 223 final provides alternative methods that the Member States can apply for fleet segments consisting of vessels of less than 12 metres in length in the outermost regions.

## 4.2 Regional trends in imbalance

Balance indicators calculated in 2024 using 2022 data show that there were 619 active fleet segments across the EU including 52,820 vessels (STECF, 2024d). An overview of balance indicator values and trends between 2018 and 2022 for each fishing region is provided below. Trends are described as one of five types: improving, deteriorating, flat trend, no clear trend identified, or no trend calculated given the data available. A breakdown of the number of fleet segments (Table 7) and total active vessels (Table 8) within each region for six balance indicators is given Table below.

### 4.2.1 North Atlantic Ocean (NAO)

Out of 143 fleet segments in the NOA region for which biological indicator SHI could be calculated. Of these, a total of 29 segments (20.3%) were out of balance and 114 (79.7%) in balance with fishing opportunities in 2022. Of those 29 out of balance, 12 (41.4%) segments were improving, 5 (17.2%) were deteriorating and 12 (41.4%) either had no trend (flat) or could not be calculated. Similar trends are observed for the numbers of active vessels. A total of 492 (12.8%) were out of balance and the remaining 3,356 (87.2%) were reported as in balance. Of those 492 out of balance, 148 (30.1%) active vessels were improving, 22 (4.5%) were deteriorating and 322 (65.4%) either had no trend (flat) or could not be calculated.

---

<sup>(46)</sup> French Guiana, Guadeloupe, Martinique, Mayotte, Réunion and Saint-Martin (France); Azores and Madeira (Portugal); Canary Islands (Spain).



Based on the 266 fleet segments for which the biological indicator SAR could be calculated, a total of 116 segments (43.6%) were out of balance and 150 (56.4%) in balance. In comparison, a higher proportion of active vessels were out of balance in the NOA (12,832 out of a total of 19,300 vessels, or 65%).

With respect to economic indicators, most of the fleet segments and number of active vessels were in balance in 2022 but the trend between 2018 and 2022 appeared to be deteriorating. For the technical indicators (VUR) no clear trend could be determined for most fleet segments and number of active vessels, whereas the latter had a higher proportion out of balance (14,344 out of 16,228 vessels, or 88.4%).

#### 4.2.2 Mediterranean and Black Seas (MBS)

Out of 94 fleet segments in the MBS region for which SHI could be calculated, a total of 52 segments (55.4%) were out of balance and 42 segments in balance. Of these 52 segments out of balance, 28 (53.8%) were improving, 3 (5.8%) were deteriorating and 21 (40.4%) either had no trend (flat) or could not be calculated. In contrast, out of a total of 15,563 active vessels in MBS for which SHI could be calculated, a total of 13,748 vessels (88.3%) were out of balance. Out of these, 11,179 (81.3%) active vessels were improving, 819 (6%) were deteriorating, and 1,750 (12.7%) either had no trend (flat) or could not be calculated.

Of the 174 fleet segments for which the biological indicator SAR could be calculated, a total of 88 segments (50.6%) were out of balance and 86 (49.4%) in balance. In comparison, a higher proportion of active vessels were out of balance in the MBS (23,620 out of a total of 31,011 vessels, or 76.2%).

Compared to the NOA region, according to economic indicators most fleet segments were in balance with fishing opportunities in 2022, whereas a higher number of active vessels were out of balance. Similarly, while no clear trend was observed in the status of technical indicators (VUR) for fleet segments, a higher number of active vessels were out of balance (26,282 out of 30,556 vessels, or 80.1%).

#### 4.2.3 Other fishing regions (OFR)

Balance indicator values for the OFR region could only be calculated for a small number of fleet segments and active vessels.

Out of 39 segments for which SHI could be calculated, a total of 6 (15.4%) were out of balance and 33 in balance with fishing opportunities in 2022. Of the 6 segments out of balance, 2 were improving and 2 were deteriorating. The remaining 2 segments either had no trends or could not be calculated. In contrast, no active vessels were deemed out of balance with fishing opportunities, and a total of 453 vessels were in balance. Of the marginal 14 fleet segments for which the biological indicator SAR could be calculated, a total of 10 segments (71.4%)

were out of balance and 4 (28.6%) in balance. Similarly, a higher proportion of reported active vessels were out of balance in the OFR (1,075 out of a total of 1,647 vessels, or 65.2%).

For the limited number of segments for which economic indicators could be calculated, the majority were in balance with fishing opportunities, with segments appearing to improve. Technical indicators show that 57 out of 59 segments were in balance with fishing opportunities in 2022.

**Table 7 – Balance indicators with numbers of fleet segments in balance or out of balance, by region: North Atlantic Ocean (NAO), Mediterranean and Black Sea (MBS) and Other Fishing Regions (OFR)**

|                           | Status              | SHI        |                | SAR        |                | CR/BER     |                | RoI        |                | RoFTA      |                | VUR        |                |
|---------------------------|---------------------|------------|----------------|------------|----------------|------------|----------------|------------|----------------|------------|----------------|------------|----------------|
|                           | Trend               | In balance | Out of balance | In balance | Out of balance | In balance | Out of balance | In balance | Out of balance | In balance | Out of balance | In balance | Out of balance |
| NAO                       | Improving           | 29         | 12             |            |                | 70         | 6              | 7          | 0              | 61         | 6              | 4          | 9              |
|                           | Deteriorating       | 2          | 5              |            |                | 37         | 22             | 12         | 13             | 48         | 47             | 4          | 0              |
|                           | Flat/null           | 1          | 0              |            |                | 0          | 0              | 0          | 0              | 0          | 0              | 10         | 0              |
|                           | No clear trend      | 54         | 11             |            |                | 22         | 6              | 0          | 0              | 1          | 0              | 95         | 91             |
|                           | No trend calculated | 28         | 1              |            |                | 27         | 27             | 8          | 17             | 22         | 32             | 21         | 57             |
| <b>NAO Total</b>          |                     | <b>114</b> | <b>29</b>      | <b>150</b> | <b>116</b>     | <b>156</b> | <b>61</b>      | <b>27</b>  | <b>30</b>      | <b>132</b> | <b>85</b>      | <b>134</b> | <b>157</b>     |
| MBS                       | Improving           | 18         | 28             |            |                | 32         | 10             | 5          | 2              | 31         | 10             | 25         | 14             |
|                           | Deteriorating       | 1          | 3              |            |                | 25         | 36             | 3          | 7              | 33         | 41             | 11         | 3              |
|                           | Flat/null           | 4          | 0              |            |                | 0          | 0              | 0          | 0              | 0          | 0              | 13         | 0              |
|                           | No clear trend      | 12         | 10             |            |                | 8          | 5              | 0          | 0              | 0          | 1              | 27         | 68             |
|                           | No trend calculated | 7          | 11             |            |                | 1          | 6              | 1          | 1              | 11         | 5              | 24         | 9              |
| <b>MBS Total</b>          |                     | <b>42</b>  | <b>52</b>      | <b>86</b>  | <b>88</b>      | <b>75</b>  | <b>57</b>      | <b>9</b>   | <b>10</b>      | <b>75</b>  | <b>57</b>      | <b>100</b> | <b>94</b>      |
| OFR                       | Improving           | 2          | 0              |            |                | 10         | 2              | 2          | 0              | 12         | 4              | 13         | 1              |
|                           | Deteriorating       | 1          | 1              |            |                | 6          | 4              | 1          | 0              | 6          | 6              | 6          | 0              |
|                           | Flat/null           | 1          | 0              |            |                | 0          | 0              | 0          | 0              | 0          | 0              | 0          | 0              |
|                           | No clear trend      | 21         | 5              |            |                | 3          | 4              | 0          | 0              | 0          | 1              | 30         | 1              |
|                           | No trend calculated | 8          | 0              |            |                | 2          | 0              | 0          | 0              | 2          | 0              | 8          | 0              |
| <b>OFR Total</b>          |                     | <b>33</b>  | <b>6</b>       | <b>4</b>   | <b>10</b>      | <b>21</b>  | <b>10</b>      | <b>3</b>   | <b>0</b>       | <b>20</b>  | <b>11</b>      | <b>57</b>  | <b>2</b>       |
| Balance result - EU fleet |                     | 189        | 87             | 240        | 214            | 252        | 128            | 39         | 40             | 227        | 153            | 291        | 253            |
| <b>Indicator EU fleet</b> |                     | <b>276</b> |                | <b>454</b> |                | <b>380</b> |                | <b>79</b>  |                | <b>380</b> |                | <b>544</b> |                |

Source: Adapted from STECF (2024d)

Values in 2022 and trend information (improving, deteriorating, etc.) for the period 2018-2022. Indicators: SHI - Sustainable Harvest Indicator; SAR - Stock-at-Risk; CR/BER - Ratio between Current Revenue and the Break-Even Revenue; RoI – Return on Investment; RoFTA - Return on Fixed Tangible Assets; VUR - Vessel Utilisation Ratio.

**Table 8 – Balance indicators with numbers of active vessels in balance or out of balance, by region: North Atlantic Ocean (NAO), Mediterranean and Black Sea (MBS) and Other Fishing Regions (OFR)**

|                           | Status              | SHI           |                | SAR           |                | CR/BER        |                | RoI          |                | RoFTA         |                | VUR           |                |
|---------------------------|---------------------|---------------|----------------|---------------|----------------|---------------|----------------|--------------|----------------|---------------|----------------|---------------|----------------|
|                           | Trend               | In balance    | Out of balance | In balance    | Out of balance | In balance    | Out of balance | In balance   | Out of balance | In balance    | Out of balance | In balance    | Out of balance |
| NAO                       | Improving           | 531           | 148            |               |                | 4 013         | 74             | 232          | -              | 4 334         | 42             | 45            | -              |
|                           | Deteriorating       | 62            | 22             |               |                | 2 982         | 267            | 337          | 2 601          | 3 145         | 815            | 96            | 159            |
|                           | Flat/null           | 65            | -              |               |                | -             | -              | -            | -              | -             | -              | 35            | -              |
|                           | No clear trend      | 1 913         | 320            |               |                | 877           | 123            | -            | -              | -             | -              | 1 550         | 11 087         |
|                           | No trend calculated | 785           | 2              |               |                | 1 936         | 2 300          | -            | -              | 1 222         | 3 014          | 158           | 3 098          |
| <b>NAO Total</b>          |                     | <b>3 356</b>  | <b>492</b>     | <b>6 468</b>  | <b>12 832</b>  | <b>9 808</b>  | <b>2 764</b>   | <b>569</b>   | <b>2 601</b>   | <b>8 701</b>  | <b>3 871</b>   | <b>1 884</b>  | <b>14 344</b>  |
| MBS                       | Improving           | 1 370         | 11 179         |               |                | 8 800         | 1 435          | 127          | 60             | 8 045         | 1 467          | 1 671         | 2 769          |
|                           | Deteriorating       | 1             | 819            |               |                | 1 971         | 7 523          | 10           | 2 217          | 2 645         | 11 176         | 1 249         | 2 970          |
|                           | Flat/null           | 25            | -              |               |                | -             | -              | -            | -              | -             | -              | 62            | -              |
|                           | No clear trend      | 354           | 1 486          |               |                | 507           | 3 111          | -            | -              | -             | 14             | 1 005         | 20 450         |
|                           | No trend calculated | 65            | 264            |               |                | 164           | 37             | -            | -              | 164           | 37             | 287           | 93             |
| <b>MBS Total</b>          |                     | <b>1 815</b>  | <b>13 748</b>  | <b>7 391</b>  | <b>23 620</b>  | <b>11 442</b> | <b>12 106</b>  | <b>137</b>   | <b>2 277</b>   | <b>10 854</b> | <b>12 694</b>  | <b>4 274</b>  | <b>26 282</b>  |
| OFR                       | Improving           | 10            | -              |               |                | 634           | 82             | 69           | -              | 702           | 51             | 167           | -              |
|                           | Deteriorating       | -             | -              |               |                | 137           | 87             | 28           | -              | 147           | 137            | 678           | 2              |
|                           | Flat/null           | 29            | -              |               |                | -             | -              | -            | -              | -             | -              | -             | -              |
|                           | No clear trend      | 332           | -              |               |                | 97            | -              | -            | -              | -             | -              | 805           | 7              |
|                           | No trend calculated | 82            | -              |               |                | 12            | -              | -            | -              | 12            | -              | 19            | -              |
| <b>OFR Total</b>          |                     | <b>453</b>    | <b>-</b>       | <b>572</b>    | <b>1 075</b>   | <b>880</b>    | <b>169</b>     | <b>97</b>    | <b>-</b>       | <b>861</b>    | <b>188</b>     | <b>1 669</b>  | <b>9</b>       |
| Balance result - EU fleet |                     | 5 624         | 14 240         | 14 431        | 37 527         | 22 130        | 15 039         | 803          | 4 878          | 20 416        | 16 753         | 7 827         | 40 635         |
| <b>Indicator EU fleet</b> |                     | <b>19 864</b> |                | <b>51 958</b> |                | <b>37 169</b> |                | <b>5 681</b> |                | <b>37 169</b> |                | <b>48 462</b> |                |

Source: Adapted from STECF (2024d)

Values in 2022 and trend information (improving, deteriorating, etc.) for the period 2018-2022. Indicators: SHI - Sustainable Harvest Indicator; SAR - Stock-at-Risk; CR/BER - Ratio between Current Revenue and the Break-Even Revenue; RoI – Return on Investment; RoFTA - Return on Fixed Tangible Assets; VUR - Vessel Utilisation Ratio.

### 4.3 Balance capacity of fleet segments at Member State level

This section provides a summary of the status of EU fleet balance using data submitted by Member States and compiled by the Joint Research Centre (JRC) to be analysed by STECF (2024d). All Member States report more than one imbalanced fleet segment (Table 9). In addition to this, small-scale fleets are more subject to inactivity, as seen by the percentage of inactive vessels and the Vessel Use Ratio (VUR) as outlined in STECF (2024d). On the other hand, medium and large-scale fleets are more likely to be out of balance with biological indicators.

**Table 9 – Balance indicators with numbers of fleet segments in balance or out of balance, by Member State in 2022, including trends between 2018-2022**

| Member State                            |                   | Biological |     | Technical | Economic      |        |
|-----------------------------------------|-------------------|------------|-----|-----------|---------------|--------|
|                                         |                   | SHI        | SAR | VUR       | ROI/<br>RoFTA | CR-BER |
| <b>Belgium (BE)</b><br><b>Area 27</b>   | In balance        | 2          | 1   | 5         | 1             | 2      |
|                                         | Out of balance    | 0          | 2   | 0         | 2             | 1      |
|                                         | Decreasing trend  | 0          | -   | 0         | 3             | 1      |
|                                         | Increasing trends | 0          | -   | 0         | -             | 1      |
|                                         | Stable/no trend   | 2          | -   | 5         | -             | 1      |
| <b>Bulgaria (BGR)</b><br><b>Area 37</b> | In balance        | 4          | 18  | 16        | 13            | 6      |
|                                         | Out of balance    | 7          | 5   | 7         | 3             | 10     |
|                                         | Decreasing trend  | -          | -   | 1         | 8             | 7      |
|                                         | Increasing trends | 6          | -   | 2         | 4             | 4      |
|                                         | Stable/no trend   | -          | -   | 14        | -             | 1      |
| <b>Croatia (HRV)</b><br><b>Area 37</b>  | In balance        | 2          | 9   | 12        | 9             | 12     |
|                                         | Out of balance    | 12         | 20  | 18        | 14            | 11     |
|                                         | Decreasing trend  | 6          | -   | -         | 14            | 11     |
|                                         | Increasing trends | 1          | -   | -         | 6             | 8      |
|                                         | Stable/no trend   | 4          | -   | 26        | -             | 1      |
| <b>Cyprus (CYP)</b><br><b>Area 37</b>   | In balance        | 1          | 3   | 0         | 2             | 2      |
|                                         | Out of balance    | 1          | 4   | 7         | 4             | 4      |
|                                         | Decreasing trend  | 0          | -   | 0         | 4             | 3      |
|                                         | Increasing trends | 0          | -   | 1         | 2             | 1      |
|                                         | Stable/no trend   | 2          | -   | 6         | 0             | 2      |
| <b>Denmark (DNK)</b><br><b>Area 27</b>  | In balance        | 4          | 7   | -         | 7             | 12     |
|                                         | Out of balance    | 3          | 18  | -         | 18            | 13     |
|                                         | Decreasing trend  | 1          | -   | -         | 6             | 1      |
|                                         | Increasing trends | 0          | -   | -         | 0             | 3      |
|                                         | Stable/no trend   | 1          | -   | -         | 0             | 2      |
| <b>Estonia (EST)</b>                    | In balance        | 1          | 1   | 0         | 2             | 2      |

| Member State  |                   | Biological |     | Technical | Economic      |        |
|---------------|-------------------|------------|-----|-----------|---------------|--------|
|               |                   | SHI        | SAR | VUR       | ROI/<br>RoFTA | CR-BER |
| Area 27       | Out of balance    | 2          | 3   | 3         | 1             | 1      |
|               | Decreasing trend  | 2          | -   | 0         | 1             | 1      |
|               | Increasing trends | 0          | -   | 0         | 0             | 0      |
|               | Stable/no trend   | 0          | -   | 1         | 0             | 0      |
| Finland (FIN) | In balance        | 3          | 1   | 3         | 1             | 1      |
| Area 27       | Out of balance    | 0          | 4   | 2         | 4             | 4      |
|               | Decreasing trend  | 3          | -   | -         | 3             | 2      |
|               | Increasing trends | 0          | -   | -         | 0             | 0      |
|               | Stable/no trend   | 0          | -   | -         | 0             | 1      |
|               |                   |            |     |           |               |        |
| France (FRA)  | In balance        | 20         | 36  | -         | 24            | 24     |
|               | Out of balance    | 5          | 32  | -         | 8             | 4      |
|               | Decreasing trend  | 4          | -   | -         | 16            | 10     |
|               | Increasing trends | 0          | -   | -         | 16            | 11     |
|               | Stable/no trend   | 19         | -   | -         | 0             | 11     |
| France (FRA)  | In balance        | 6          | 14  | -         | 14            | 14     |
|               | Out of balance    | 0          | 12  | -         | 1             | 1      |
|               | Decreasing trend  | 0          | -   | -         | 8             | 11     |
|               | Increasing trends | 1          | -   | -         | 2             | 4      |
|               | Stable/no trend   | 5          | -   | -         | 5             | 0      |
| France (FRA)  | In balance        | 1          | 0   | -         | 0             | 0      |
|               | Out of balance    | 0          | 1   | -         | 1             | 1      |
|               | Decreasing trend  | 0          | -   | -         | 1             | 1      |
|               | Increasing trends | 0          | -   | -         | 0             | 0      |
|               | Stable/no trend   | 1          | -   | -         | 0             | 0      |
| Germany (DEU) | In balance        | 7          | 11  | 11        | 2             | 4      |
|               | Out of balance    | 3          | 4   | 13        | 13            | 11     |
|               | Decreasing trend  | 5          | -   | 3         | 7             | 5      |
|               | Increasing trends | 0          | -   | 0         | 2             | 2      |
|               | Stable/no trend   | 2          | -   | 10        | 0             | 2      |
| Greece (GRC)  | In balance        | 1          | 9   | 10        | 9             | 9      |
|               | Out of balance    | 5          | 5   | 4         | 5             | 5      |
|               | Decreasing trend  | 1          | -   | 2         | 7             | 7      |
|               | Increasing trends | 0          | -   | 4         | 3             | 3      |
|               | Stable/no trend   | 0          | -   | 4         | 0             | 0      |
| Ireland (IRL) | In balance        | 7          | 12  | 2         | 8             | 10     |
|               | Out of balance    | 4          | 9   | 26        | 9             | 7      |
|               | Decreasing trend  | 1          | -   | -         | 2             | 1      |
|               | Increasing trends | 6          | -   | -         | 1             | 1      |
|               | Stable/no trend   | 3          | -   | -         | 0             | 1      |
| Italy (ITA)   | In balance        | 8          | 9   | 7         | 12            | 15     |
|               | Out of balance    | 11         | 19  | 23        | 9             | 6      |
|               | Decreasing trend  | 10         | -   | 10        | 12            | 7      |

| Member State                     |                   | Biological |     | Technical | Economic      |        |
|----------------------------------|-------------------|------------|-----|-----------|---------------|--------|
|                                  |                   | SHI        | SAR | VUR       | ROI/<br>RoFTA | CR-BER |
|                                  | Increasing trends | 0          | -   | 2         | 8             | 8      |
|                                  | Stable/no trend   | 8          | -   | 15        | 0             | 5      |
| Latvia (LVA)<br>Area 27          | In balance        | 0          | 4   | 1         | 4             | 4      |
|                                  | Out of balance    | 2          | -   | 3         | 0             | 0      |
|                                  | Decreasing trend  | -          | -   | 0         | -             | 0      |
|                                  | Increasing trends | -          | -   | 0         | -             | 1      |
|                                  | Stable/no trend   | -          | -   | 2         | -             | 1      |
|                                  |                   |            |     |           |               |        |
| Lithuania (LTU)<br>Area 27       | In balance        | 1          | 1   | 4         | 1             | 1      |
|                                  | Out of balance    | 2          | 4   | 1         | 2             | 2      |
|                                  | Decreasing trend  | 0          | -   | 0         | 1             | 0      |
|                                  | Increasing trends | 3          | -   | 1         | 0             | 0      |
|                                  | Stable/no trend   | 0          | -   | 2         | 0             | 1      |
| Lithuania (LTU)<br>OFR           | In balance        | 2          | 1   | 1         | 1             | 1      |
|                                  | Out of balanced   | 0          | 1   | 0         | 0             | 0      |
|                                  | Decreasing trend  | 1          | -   | 0         | 0             | 0      |
|                                  | Increasing trends | 0          | -   | 0         | 1             | 1      |
|                                  | Stable/no trend   | 1          | -   | 1         | 0             | 0      |
| Malta (MLT)<br>Area 37           | In balance        | 1          | 3   | 10        | 5             | 6      |
|                                  | Out of balance    | 6          | 7   | 9         | 4             | 4      |
|                                  | Decreasing trend  | 2          | -   | 2         | 3             | 4      |
|                                  | Increasing trends | 0          | -   | 0         | 5             | 5      |
|                                  | Stable/no trend   | 4          | -   | 13        | 0             | 0      |
| The Netherlands (NLD)<br>Area 27 | In balance        | 1          | 10  | 4         | 7             | 11     |
|                                  | Out of balance    | 5          | 1   | 7         | 3             | 0      |
|                                  | Decreasing trend  | 3          | -   | 0         | 3             | 4      |
|                                  | Increasing trends | 0          | -   | 0         | 7             | 5      |
|                                  | Stable/no trend   | 3          | -   | 8         | 0             | 2      |
| Poland (POL)<br>Area 27          | In balance        | 5          | 3   | 2         | 3             | 6      |
|                                  | Out of balance    | 0          | 7   | 9         | 4             | 1      |
|                                  | Decreasing trend  | 4          | -   | 2         | 4             | 4      |
|                                  | Increasing trends | 0          | -   | 1         | 0             | 0      |
|                                  | Stable/no trend   | 0          | -   | 3         | 0             | 0      |
| Portugal (PRT)<br>Area 27        | In balance        | 10         | 26  | 24        | 29            | 305    |
|                                  | Out of balance    | 0          | 9   | 13        | 6             | 6      |
|                                  | Decreasing trend  | 0          | -   | 0         | 14            | 9      |
|                                  | Increasing trends | 2          | -   | 0         | 20            | 23     |
|                                  | Stable/no trend   | 8          | -   | 36        | 1             | 3      |
| Portugal (PRT)<br>OFR            | In balance        | 2          | 0   | 2         | 2             | 2      |
|                                  | Out of balanced   | 0          | 2   | 0         | 0             | 0      |
|                                  | Decreasing trend  | -          | -   | -         | -             | -      |
|                                  | Increasing trends | -          | -   | -         | -             | -      |
|                                  | Stable/no trend   | -          | -   | -         | -             | -      |



| Member State                            |                   | Biological |     | Technical | Economic      |        |
|-----------------------------------------|-------------------|------------|-----|-----------|---------------|--------|
|                                         |                   | SHI        | SAR | VUR       | ROI/<br>RoFTA | CR-BER |
| <b>Romania (ROU)</b><br><b>Area 37</b>  | In balance        | 2          | 7   | 4         | 2             | 2      |
|                                         | Out of balance    | 3          | 0   | 3         | 1             | 1      |
|                                         | Decreasing trend  | -          | -   | 0         | 2             | 2      |
|                                         | Increasing trends | -          | -   | 4         | 0             | 0      |
|                                         | Stable/no trend   | -          | -   | 2         | 0             | 0      |
| <b>Slovenia (SVN)</b><br><b>Area 37</b> | In balance        | -          | 2   | 3         | 3             | 3      |
|                                         | Out of balance    | -          | 1   | 0         | 0             | 0      |
|                                         | Decreasing trend  | -          | -   | -         | 1             | -      |
|                                         | Increasing trends | -          | -   | -         | 2             | -      |
|                                         | Stable/no trend   | -          | -   | -         | 0             | -      |
| <b>Spain (ESP)</b><br><b>Area 27</b>    | In balance        | 19         | 22  | 26        | 22            | 23     |
|                                         | Out of balance    | 3          | 15  | 11        | 4             | 3      |
|                                         | Decreasing trend  | 3          | -   | 4         | 13            | 12     |
|                                         | Increasing trends | 1          | -   | 3         | 10            | 10     |
|                                         | Stable/no trend   | 7          | -   | 24        | 0             | 1      |
| <b>Spain (ESP)</b><br><b>Area 37</b>    | In balance        | 10         | 12  | 18        | 12            | 13     |
|                                         | Out of balance    | 3          | 15  | 9         | 8             | 7      |
|                                         | Decreasing trend  | 7          | -   | 3         | 11            | 9      |
|                                         | Increasing trends | 0          | -   | 0         | 7             | 9      |
|                                         | Stable/no trend   | 1          | -   | 21        | 0             | 0      |
| <b>Spain (ESP)</b><br><b>OFR</b>        | In balance        | 4          | 2   | 8         | 5             | 6      |
|                                         | Out of balance    | 0          | 6   | 0         | 1             | 1      |
|                                         | Decreasing trend  | 1          | -   | 2         | 3             | 3      |
|                                         | Increasing trends | 0          | -   | 0         | 3             | 3      |
|                                         | Stable/no trend   | 2          | -   | 6         | 0             | 0      |
| <b>Sweden (SWE)</b><br><b>Area 27</b>   | In balance        | 17         | 15  | 2         | 5             | 5      |
|                                         | Out of balance    | 4          | 16  | 7         | 4             | 4      |
|                                         | Decreasing trend  | 7          | -   | 2         | 6             | 6      |
|                                         | Increasing trends | 3          | -   | 0         | 3             | 3      |
|                                         | Stable/no trend   | 7          | -   | 18        | 0             | 2      |

Source: EWG-24-13 and own elaborations.

Colour of cells represent trends: improving (green), deteriorating (red) or stable/none (blue). The total number of fleet segments showing different trends (increasing, decreasing, stable) for each Member State may differ to the total number of fleet segments (i.e. both in balance and imbalanced) for each indicator due to data availability.

For fleet segments with demonstrated imbalance, Member States must take measures to achieve the balance. These measures should be included in an Action Plan (AP). An example of a measure is decommissioning of vessels through public funding. When a Member State fails to report or does not implement the AP, this may lead to proportionate suspension or interruption of the relevant EU funding (as stipulated in Article 22 of 2013 CFP Regulation).

In 2024, according to the STECF Expert Working Group (EWG), new APs were presented by Lithuania and Malta, whereas Latvia submitted an AP in 2023 and is in the implementation phase, and Croatia continued with their existing AP. An update of existing APs was provided by ten Member States – Bulgaria, Cyprus, Denmark, France, Germany, Italy, Poland, Portugal, Romania and Spain (STECF, 2024d). Of these, only Cyprus, Croatia, Germany, Lithuania, Poland, Portugal and Spain were considered by the EWG as sufficiently detailed regarding the timeframe, measures to be implemented, and objectives and targets for reducing the perceived level of imbalance in fleet segments.

The EWG found a total of eight Member States (Belgium, Estonia, Finland, Greece, Ireland, the Netherlands, Slovenia and Sweden) had not included a new or updated APs in either their 2023 or 2024 annual report (STECF, 2024d). Of these, Greece was preparing an AP but was not submitted with the annual report in 2024, the Netherlands had not provided an AP due to the “consequences of the North Sea sole stock benchmark and the ongoing negotiations between the Coastal States on the pelagic stock management”, while the others did not present any AP because these countries considered all fleet segments to be in balance.

## 4.4 Case studies of drivers for imbalance and persistence

The overview of national fleet balance indicators shows that several EU fisheries or fleet segments are out of balance, either with the fishing opportunities or in terms of one or more economic or technical indicators.

To better understand the reasons why imbalances arise within fleet segments and the main drivers behind the observed trends, as perceived by stakeholders, five case studies were carried out in different sea basins. These are (i) demersal trawl fisheries in the Western Mediterranean; (ii) Portuguese longline fleets in external waters; (iii) Spanish fleets in the Atlantic EU Western Waters; (iv) Polish fisheries in the southern Baltic Sea; and (v) demersal mixed fisheries in the North Sea.

Each case study summarised the main trends in fleet capacity and engaged different stakeholder groups to enable an in-depth analysis. Further details of each case study are provided in Annex 2. The following tables present a summary of the main findings from stakeholders' views in each case study.

**Across all five case studies, fleet imbalance is driven by a combination of biological constraints, economic pressures, policy design, and structural characteristics of fleets, but the relative importance of these drivers differs markedly by region.**

Rising operating costs, emerge as a cross-cutting driver of reduced profitability and imbalance in the Western Mediterranean, Portuguese, Spanish and North Sea case studies. Workforce challenges, notably ageing fishers and crew shortages, are persistent, particularly in small-scale fleets (<12 m) in the Western Mediterranean, Spanish, Portuguese, and Polish case studies. Environmental change is increasingly recognised everywhere as a factor affecting stock productivity, from climate change and pollution in the Western Mediterranean to hypoxia and warming in the Baltic Sea and shifting conditions in the North Sea.

**Table 10 – Main findings from the case study on demersal trawl fisheries in the Western Mediterranean (France, Italy and Spain), including stakeholders' perceptions of the main drivers of fleet imbalance. See Annex 2 for detailed findings**

| Trends in fleet balance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Perceived main drivers of fleet imbalance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Recent stock assessments by GFCM and STECF confirm an increase in sustainability of several exploited demersal stocks, including shrimps and red mullet in all GSAs in the Western Mediterranean (FAO, 2023; GFCM, 2024a; STECF, 2024a,b). Despite some recent positive trends in terms of stock status and balance-capacity indicators (e.g. SHI, SAR), most stocks with validated assessments continue to be fished beyond biologically sustained limits, with fishing mortality being, in general, still above <math>F_{MSY}</math>. Consequently, fleet segments within the <b>bottom trawl demersal fisheries</b> in the Western Mediterranean remain <b>out of balance with fishing opportunities since 2020</b>. Out of a total of 19 fleet segments, 15 are deemed out of balance.</p> <p>Over the past five years, demersal trawlers operating in the Western Mediterranean have faced a <b>substantial decline in total income</b>. This downward trend is reflected in Gross Value Added, Gross Profit, and Net Profit, all of which have steadily decreased. The decline has been gradual, with a particularly sharp drop after 2019. Net profit, which had exceeded EUR 30 million in 2018, has consistently fallen year after year, when in 2022, net profit turned negative, indicating a financial loss. This loss is primarily driven by a reduction in catch volumes, which has not been compensated by higher producer prices.</p> <p>Reductions in economic performance indicators, such as RoFTA and CR/BER, have not affected all vessel size classes uniformly. The <b>most pronounced declines in RoFTA were observed in the DTS2440</b> fleet segments. In 2022, trawlers from France, Spain, and Italy operating in Western Mediterranean fishing areas reported negative RoFTA values. The DTS1824 and DTS1218 segments maintained satisfactory profitability levels until 2021, although both RoFTA and CR/BER showed a downward trend over the 2018-2022 period.</p> <p>With regards to vessel utilisation (VUR), the results show that with exception to the DTS2440 in GSA 9, <b>most underutilised Italian fleet segments</b>, with a higher number of inactive vessels, are represented by smaller vessels, especially <b>under 12 m where fishing is a complementary activity</b>.</p> | <p>France, Italy and Spain have large and diverse fishing fleets. Each segment is affected by various factors, making it difficult to identify common drivers. Between 2018 and 2022, the economic situation of the fishing sector was influenced by external factors that directly impacted their short-term profitability.</p> <p><b>Policy and regulatory issues:</b> The multiannual plan for the Western Mediterranean (WestMed MAP) has been seen by national authorities and Producer Organisations as a response to the out of balance status of most of the fisheries in the region, but its impact on fleet sustainability and performance is still unclear due to the short time since its implementation (2019).</p> <p><b>Slow stock improvement:</b> Though stocks are improving, overfishing hake stocks remain below target biomass.</p> <p><b>Environmental impact:</b> Some respondents from Producer Organisations, highlighted that the current scientific advice on stock status does not fully consider climate change and pollution's impact on fishing mortality.</p> <p><b>Economic factors:</b> The deterioration of key economic indicators was closely linked to a significant increase in operating costs. Within the EU Multi-Annual Management Plan (MAP), a 40% reduction in fishing effort over five years is expected, leading to decreased fleet activity. This, combined with the unprovoked Russian aggression against Ukraine, have driven up energy costs and negatively impacted fleets. Unlike other regions, the economic impact of COVID-19 appears to have had minimal impact on the fishing sector.</p> <p><b>Technical and methodological challenges:</b> According to responses from stakeholders, fleet inactivity in the under 12 m fleet segments is driven by ageing fishers and the challenges of finding new crew members, using inefficient vessels.</p> |

**Table 11 – Main findings from the case study on Portuguese pelagic longline fleets in external waters, including stakeholders' perceptions of the main drivers of fleet imbalance. See Annex 2 for detailed findings**

| Trends in fleet balance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Perceived main drivers of fleet imbalance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Portugal maintains an <b>active pelagic longline fleet</b> under the jurisdiction of tuna Regional Fisheries Management Organisations (t-RFMOs), with most activity concentrated in the ICCAT. The fleet's development in the late 1970s, expanded first in the North Atlantic and later in the South Atlantic. Since its inception, the <b>fishery has faced structural imbalances</b>, requiring successive layers of administrative intervention to prevent collapse. This has left the fleet in a state of "continuous rescue from imbalance."</p> <p>Based on the combined application of biological, economic, and activity indicators, the <b>longline fishing segment (HOK) for vessels over 12 metres in length presents several challenges</b>. The vulnerabilities are particularly significant for vessels over 24 metres in overall length, as these require more labour and have a lower catch capacity, making them especially unprofitable. One specific sub-segment of this fleet is <b>surface longliners</b>, which primarily target swordfish. However, the <b>allocated quota for the EU Northern Atlantic waters remains insufficient</b> to maintain regular operations throughout the year.</p> <p>In addition, <b>the utilisation rate has deteriorated for vessels between 18 and 24 metres in length as well as within the HOK VL40XX segment</b>. Portugal has placed special focus on monitoring vessels over 12 metres, implementing adjustments to better align fleet capacity with available resources. These <b>measures include ongoing permanent vessel decommissioning</b>, as outlined in the 2023 Action Plan from the 2022 Annual Fleet Report, as well as temporary immobilisation of the licensed fleet with swordfish quotas for the northern stock in 2023 (DGRM, 2024).</p> <p>Landings are determined through <b>quota management</b>, which has evolved through multiple legislative reforms. Access to quota was later restricted to vessels meeting certain sales criteria. Additional fleets, such as those displaced by the end of the EU-Morocco agreement, were granted access, creating persistent pressure on available quotas. Measures such as sub-quotas by region (2004), attempts to <b>shift effort to the South Atlantic</b> (2007), and the introduction of <b>individual transferable quotas</b> (ITQs) (2013) were introduced to improve fairness and manageability. Legislation in 2022 expanded flexibility in quota transfers and allocation. <b>Quota availability in the EU Northern Atlantic waters remains insufficient</b>, often requiring high-level political negotiations, while foreign fleets' quotas continue to be underutilised.</p> | <p>Responses from national authorities, producer organisations, fishing operators and NGOs identified several drivers behind reported changes in fleets out of balance over the past five years, including:</p> <p><b>Quota management and resource allocation:</b> What is seen as a major cause of fleet imbalance is inadequate quota allocation, with many fleets unable to fully utilize available resources due to restrictive quota systems. Discrepancies in resource assessments and slow updates to stock evaluations might lead to misalignments between actual fish stocks and available quotas.</p> <p><b>Economic constraints and market conditions:</b> Rising production costs (fuel, maintenance, and materials), along with the impact of external economic crises like COVID-19, are seen to have worsened fleet imbalances. Additionally, competition from frozen fish imports, particularly from Morocco, has affected market prices. Economic pressures are compounded by a lack of financial autonomy for vessel owners, hindering fleet renewal.</p> <p><b>Workforce and technological challenges:</b> Crew shortages, have strained fleet operations. The fleet also faces difficulties due to an aging workforce and outdated vessels. While technological advancements have increased efficiency, they have also intensified fishing pressure on resources.</p> <p><b>Policy and regulatory issues:</b> Current EU policy, particularly in quota management and fleet regulation, are seen as contributing to imbalances, with some stakeholders advocating for more flexible quota-sharing mechanisms. The perceived lack of a strategic EU plan for fleet sustainability and the possible misalignment of quotas with actual resource availability would exacerbate the situation. Additionally, national political decisions, including those related to ex-Morocco's fleet entry, may have added complexity to resource management.</p> <p><b>External factors and long-term strategies:</b> While Brexit is seen to have had minimal direct impact on Portugal's fleet, external factors like geopolitical crises and global market shifts may have influenced fleet balance. The long-term effectiveness of subsidies (e.g., EMFAF) is questioned, as they provide short-term relief but may increase fishing effort in the long run, worsening resource pressure.</p> |

**Table 12 – Main findings from the case study on Spanish fleets in the Atlantic EU Western Waters, including stakeholders' perceptions of the main drivers of fleet imbalance. See Annex 2 for detailed findings**

| Trends in fleet balance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Perceived main drivers of fleet imbalance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>According to MAPA, the Spanish fleet operating in the North Atlantic EU Western Waters is <b>deemed largely in balance</b>, with only <b>two segments currently in a global out of balance situation</b>, i.e. DRB1218 and DRB1824 targeting Venus clam in the Gulf of Cadiz. However, a review of the National Plans and their economic, biological and technical indicators shows that many fleets, such as <b>demersal trawlers, longliners, driftnets and dredges, are repeatedly out of balance for some or even most of the indicators</b> in the period 2018-2022.</p> <p>Overall, it can be stated that the number of segments with an <b>out of balance SHI indicator has decreased</b> in the period 2018 – 2022. In 2018, there were six segments out of balance (55% of the evaluated segments) and currently there are three (16%). In the period 2018 - 2020, the segments of driftnets DFN1218, DFN1824, DTS 2440 were out of balance regarding the SHI indicator. With respect to the <b>SAR indicator</b>, the number of fleets that are out of balance in the period 2020 – 2022 has decreased from 15 (45% of all segments assessed) to 11 (33%). There are <b>seven fleet segments that are consistently out of balance</b> in all years, i.e. DFN1012 and DFN1218, DTS1218, DTS1824, DTS40XX, HOK1012, PGP2440. There are a few others that seem to be starting a negative trend, being out of balance in this indicator in the last two years of the series, i.e. DTS2440, DTS40XX, HOK1218 and PMP0010.</p> <p>According to the latest National Fleet Report (MAPA, 2024), the <b>CR/BER indicator is out of balance in three fleet segments</b>. The <b>ROFTA indicator is currently out of balance in five fleet segments</b>.</p> <p>The National Fleet Reports indicate that <b>a given fleet segment may be in balance in global terms despite the technical indicator (activity) being out of balance</b>, provided that the biological and economic indicators are in balance. Between 30 and 34 fleet segments in the North Atlantic were assessed in terms of the technical indicator in the period 2018 – 2022. In 2020 and 2022, 12 segments in this sea area were classified as out of balance for this indicator, compared with 10 segments in the previous two years.</p> <p>The current <b>Action Plan applies to two dredging segments</b>. These segments have shown recurrent imbalance for most indicators during the study period. The ministry considers that the economic deterioration of the activity requires a reduction in redundant fishing capacity. To this end, a decommissioning programme has been introduced to scrap 15 dredges using public funding.</p> | <p>As each fleet segment can be affected by different factors influencing equilibrium, there is no single explanation for the changes that have occurred in each segment. Some segments have fallen out of balance due to the state of the main target stock, while others have moved into balance due to cost reductions or good economic performance.</p> <p><b>Policy and management:</b> Within the Venus clam fishery, the IEO (2019) reported that the management measures implemented for the sustainable exploitation of the Venus clam have not prevented a decline in the abundance of the species, which reached values close to the limit biomass.</p> <p><b>Economic impacts:</b> MAPA indicate that the increase in energy prices in recent years has had a significant negative impact on the economic results of the different segments of the fleet. In addition, the COVID-19 pandemic and its lockdown are also among the factors determining negative economic results, particularly for operators dealing with fresh fish (MAPA, 2022). Nevertheless, the MAPA respondents to the survey considered that the economic indicators may not be representative for small fleets. Specifically, within the Venus clam fishery, the poor economic performance is due to the closures of the clam fishery in recent years (MAPA, 2023). It is also likely that the increase in energy costs has also had a negative impact on the economic performance of these segments.</p> <p><b>Technical management constraints:</b> The current segmentation of the Spanish fleet is seen as rather rigid and hinders an accurate characterization of the fleet (MAPA, 2021). This can make it difficult to carry out assessments and propose management measures that are more suited to the characteristics of the Spanish fleets, where the majority of vessels are of small-scale nature</p> <p><b>Workforce and technological challenges:</b> Most of the inactive vessels belong to the fleet of less than 12 m length, where fishing is not the main economic activity for the boat owners, thus vessels may have periods of inactivity. Furthermore, the small-scale nature of the activity in terms of seasonality and the fact that this activity is often complementary to the main economic activity for many fishers may also hamper the accurate use of technical indicators such as the technical indicator (VUR, max = 220 days) not suitable for the characteristics of small-scale fleets segments.</p> |



**Table 13 – Main findings from the case study on fisheries in the southern Baltic Sea (Polish example), including stakeholders' perceptions of the main drivers of fleet imbalance. See Annex 2 for detailed findings**

| Trends in fleet balance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Perceived main drivers of fleet imbalance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>In the Baltic Sea, where cod stocks are at very low levels, the primary species caught by Polish fishers are sprat, herring, flatfish and whiting, as well as freshwater species such as bream, roach, perch and stickleback. The Polish fishing fleet operates mainly in the southern part of the sea. Vessels under 12 m typically use passive gear (VL0008, VL0812) and fish close to their home ports, which makes the fleet particularly vulnerable to changes in resource availability, catch limitations, MPAs and other maritime restrictions. Vessels over 12 m are typically drift or fixed nets (VL1218), demersal trawlers (VL1218) or pelagic trawlers (VL1218, VL1218, VL2440).</p> <p>Over the period 2021-2023, the biological indicator <b>SHI has been declining</b>, and on average show that all fleet segments, except VL1824DTS, were balanced. Specifically, results show on average, fleet segments VL1218DFN, VL1218DTS, VL1218TM, VL1824TM and VL 2440TM are in balance with available fishing opportunities, although only TAC-limited species with a maximum sustainable fishing mortality rate were evaluated. Furthermore, for two fleet segments (VL0008PG and VL0812PG), SHI values were considered 'unavailable' as the proportion of total catch value was less than 40%. In addition, there <b>no fleet segments in which landings of SAR</b> (Western Baltic herring and both cod stocks) exceeded 10% of the segment's landings.</p> <p>Economic indicators (<b>ROI and CR/BER</b>) point to a <b>lack of profitability in all fleet segments not engaged in pelagic trawling</b>, although due to data availability from DCF, economic indicators were only calculated for 2022. Overall, negative ROI values were reported for the VL0008PG, VL0812PG, VL1218DFN and VL1218DTS segments, indicating an imbalance between fishing capacity and fishing opportunities. In addition, the CR/BER indicator confirmed that vessels in these segments do not generate sufficient revenues to cover operating costs.</p> <p>With regards to <b>vessel utilisation (VUR)</b>, the results show that all fleets are underutilised (less than 70%), with only two segments (VL1218TM and VL2440TM) achieved values higher than 50%.</p> <p><b>Implemented Action Plan</b> foresees a permanent reduction in fishing effort. By the end of March 2025, 130 vessels had been withdrawn from the Polish fishing fleet register.</p> | <p><b>Fishing capacity:</b> Despite a relatively stable number of vessels in the Polish fishing fleet between 2014 and 2023, only minor changes were observed in overall fleet capacity and engine power. These changes were mainly driven by shipowners replacing older vessels, modernisation, and other structural adjustments. However, in December 2023, permanent cessation measures resulted in a substantial reduction in fleet size to 718 vessels. By the end of first quarter of 2025, the Polish fleet register listed 690 remaining vessels.</p> <p><b>Environmental impacts:</b> Environmental conditions have had a significant influence on the stock status and fishing opportunities within the Baltic Sea. The basin is characterised by extensive anoxic (oxygen-free) layers and high nutrient concentrations, which are known to cause reproductive failure of key commercial species. This has resulted in little or no recovery of the Western Baltic Sea herring and all cod stocks, despite the absence of a directed fishery for several years. Climate change further exacerbates these pressures through increased water temperatures and shifts in species distribution.</p> <p><b>TACs, quota uptake:</b> Changes in stock abundance has led to major reductions in available fishing opportunities, including the continued absence of directed cod fisheries. In addition, industry representatives highlighted that TAC-managed stocks can experience substantial year-to-year quota fluctuations (e.g. herring: -42% in 2024 and +108% in 2025), contributing to economic instability.</p> <p><b>Socio-economic analysis and indicators:</b> Fishing industry representatives pointed to excessive fishing effort in the small-scale fleet, which they attribute partly to regulatory frameworks that encourage low-volume marginal activity. From a management perspective, persistent overfishing, adverse environmental conditions, and global market dynamics - where fish prices are largely set internationally – are seen as key underlying drivers.</p> <p><b>Technical and methodological challenges:</b> According to stakeholders, vessel inactivity is not directly linked to poor economic performance. In many cases, particularly for larger vessels, inactivity is related to renovation or modernisation, while owners of vessels under 12 m often engage in complementary economic opportunities.</p> |



**Table 14 – Main findings from the case study on mixed demersal fisheries (Denmark, Belgium, The Netherlands and Germany), including stakeholders' perceptions of the main drivers of fleet imbalance. See Annex 2 for detailed findings**

| Trends in fleet balance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Perceived main drivers of fleet imbalance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>North Sea fleets comprise quota-targeting vessels and fleets targeting non-quota species. Mixed demersal fisheries in the Greater North Sea (NSEA) suffered from recent geopolitical shifts (e.g. Brexit), environmental changes, and rising operational costs, especially crew wages and fuel. Between 2013-2023, vessel numbers, tonnage (GT) and engine power (kW) declined across Member States. While these reductions help reduce overcapacity in some segments, they create risks of underutilisation and long-term viability. Some fleet segments may remain imbalanced due to choke species, which limit fishing opportunities for other stocks.</p> <p><b>Belgium:</b> Overall, the fleet shows no biological, economic, or technical imbalance: only TBB VL2440 had a SAR value indicating at risk in 2023, but this relates to a small share of landings and is based on provisional data, while all fleet segments remain economically viable and technically balanced according to RoFTA, CR/BER, and technical indicators. Mixed short-term economic performance was observed, but no segment meets the criteria for imbalance under multi-year assessment frameworks.</p> <p><b>Denmark:</b> The 2023 fleet capacity report shows no clear biological or overall economic imbalance for North Sea demersal mixed fisheries. SAR results were either irrelevant to the area or not indicative of risk, and most economic indicators (ROI, CR/BER) were within acceptable ranges despite some near-imbalance signals. Technical indicators largely showed balance in 2023, with only the VUR for DTS VL1824 below threshold, while previous years showed more widespread (near) imbalance.</p> <p><b>Germany:</b> An analysis of balance indicators shows that key fleet segments are generally well balanced, with improving SHI trends for both DTS segments, a declining number of at-risk stocks since 2019, and no structural imbalance in major catch-contributing fleets. CR/BER indicator shows economic losses among small passive-gear vessels, that reflect their non-commercial or supplementary nature and do not indicate a capacity–opportunity imbalance.</p> <p><b>The Netherlands:</b> Three fleet segments show biologically imbalanced based on the SAR indicator (PG-VL1012, TBB-VL2440 and TBB-VL40XX), due to earlier assessments of North Sea sole that now indicate the stock to be fished below <math>F_{MSY}</math> following reduced pressure in 2019-2024. Economic indicators for the Dutch fleet reveal a deteriorating situation, with three key metrics, ROI, RoFTA, and GVA showing a marked downward trend over the past five years.</p> | <p><b>Fishing capacity:</b> Fishing capacity in North Sea mixed demersal fisheries has declined since 2013, especially in Denmark and the Netherlands due to Brexit-related decommissioning. Differences in national management approaches and interpretations of balance indicators lead to contrasting assessments, while stakeholders point to choke species, fuel costs, environmental change, and Brexit as key drivers of imbalance, highlighting the need for context-specific and adaptive rebalancing strategies.</p> <p><b>TACs, quota uptake, and quota swaps:</b> High-quality stock assessments are essential for setting appropriate quotas, managing fleets, and evaluating capacity use through quota uptake and swapping, though swaps in North Sea mixed demersal fisheries have remained limited and likely underused. Persistently low quota uptake is largely driven by choke species with restrictive quotas or species with low market prices, which can create fleet imbalances not captured by uptake alone but reflected in broader STECF balance indicators, suggesting a need for diversification and alternative fishing strategies.</p> <p><b>Socio-economic analysis and indicators:</b> Fishing capacity depends on vessel characteristics, fishing methods, target species, available quotas, and socio-economic factors, and is closely linked to fleet balance. The economic performance of fishing segments is strongly affected by cost structures, vessel age, depreciation, and differing earning models, which can vary widely even within the same CFP and DCF fleet segments. Persistently high costs—especially for crew wages and energy—can reduce profitability and increase the risk of long-term fleet imbalance.</p> <p><b>Environmental impacts:</b> Stakeholders noted that environmental changes in the North Sea, such as shifts in temperature and other physical conditions, are increasingly affecting fisheries and may influence fleet capacity in the future. While some questioned whether capacity should adapt to factors external to fishing, the long-term nature of these changes makes fleet adaptation unavoidable to safeguard future fishing opportunities.</p> <p><b>Technical and methodological challenges:</b> Inconsistent and non-transparent quota data across sources created uncertainty over data quality, limiting analysis and complicating assessment of quota swaps and uptake, especially given differing national systems such as local quota pooling in Denmark. These issues highlight methodological limits of current balance indicators and suggest that incorporating more dynamic biological, operational, and socio-economic factors would improve their relevance.</p> |

## 5 Policy approaches outside the EU

Many non-EU countries and regional bodies have also developed different strategies to align their policies with the Food and Agriculture Organization (FAO) international plan of action for the management of fishing capacity (IPOA-Capacity) <sup>(47)</sup>. Considerable efforts have been made to address the problem of overcapacity, and a variety of mechanisms has been put in place to reduce the incentives to accumulate capacity or to provide the means to reduce it. The management of fleet capacity coexists with the management of other aspects of fishing fleets, such as environmental and social aspects. The use of additional space on board to improve energy efficiency, habitability and crew safety also has implications for fishing capacity management.

An overview of international experiences in the management of fishing fleet capacity can help distil several lessons that could be useful to the EU context, identifying what systems could be applied to managing fleet capacity within the current EU fisheries management framework. This section describes how various countries outside the EU have managed their fleets not only to address capacity accumulation in terms of resource sustainability and economic risks, but also to incorporate social considerations (i.e. working conditions and safety onboard).

The study reviewed seven case studies and describes the experience of different countries (Iceland, South Africa, New Zealand, USA, China, Norway, and UK) on five continents in managing their fishing fleets. Details of case studies can be consulted in Annex 3. The main findings of the seven cases are presented in Table 15-Table 21 below.

The review shows that fishing capacity was built in response to significant fishing opportunities, which were mostly provided by the extended fisheries jurisdictions in the late 1970s. Large public funds were typically devoted to helping private operators make use of the available resources. However, escalating resource depletion and global environmental concerns gradually led to the adoption of international FAO guidelines and the implementation of measures to deter or eliminate fleet capacity in many countries. The present analysis identified a variety of approaches tailored to the specific characteristics of the fleets in question. Notably, a number of these approaches are common across the different cases and, to some extent, at EU level.

Decommissioning schemes were used in some fisheries to reduce structural fleet capacity, predominantly funded by public money, as illustrated by the Iceland and Alaska case studies (Table 15 and Table 18). This mirrors developments in the EU. Rights-based management was the most common approach used in the

---

<sup>(47)</sup> <https://www.fao.org/fishery/en/ipoa-capacity>

cases analysed. The approach is effective for aligning fleet capacity with fishing opportunities. However, these systems may require complementary measures, such as decommissioning schemes, to promote more flexible and timely fleet rationalization. Allowing rights to be transferred when a vessel is removed provides an additional incentive for vessel owners to leave the fishery. Similar measures have been implemented at the Member State level in the EU. Notably, international experience with decommissioning schemes implemented within a rights-based management framework has been positive, because private operators are responsible for decisions on adjusting capacity in line with allocated fishing opportunities, as seen in the New Zealand and Norway case studies (Table 17 and Table 20). The use of comprehensive ITQ systems in the EU, which offer sufficient flexibility for fishers to make entrepreneurial decisions, may similarly encourage vessel owners to reduce redundant capacity using their own resources.

Another mechanism widely used by decision-makers is to protect small-scale fishing fleets through the allocation of quotas to coastal communities or by restricting the exchange of rights with large-scale fishing fleets. These mechanisms complement rights-based management and help prevent small-scale operators from being absorbed by larger ones if they compete in the same market (e.g. USA case study, Table 18). They are widely applied due to the need to protect the social fabric and preserve intangible assets, such as traditional fishing practices and values, as well as maintaining employment levels in fishing and related activities within fishing communities.

Similar measures exist in the EU when ITQs and other forms of rights-based management are in force. In the absence of a rights-based management mechanism, subsidies to compensate fishers for the temporary or permanent cessation of fishing have also been identified. This is similar to the EU and appears to reflect the strong social orientation of fishing activities and the recognition of their importance for food security. Notably, these measures are adopted in regions such as China (Table 19), where market-oriented mechanisms are not widely applied.

Rights-based management appears to allow fishing operators to take care of their own decisions as entrepreneurs and as such depend less on public support. This is relevant not only to withdrawing vessels but also for investment in new ones. Operators tend to reflect more carefully on investments when they are not supported by public administrations.

Wider implementation of these systems, particularly ITQs, may not be possible as Member States retain the responsibility for managing their own fleets, and market-based approaches may not be applicable in some countries due to predominance of small-scale activities or strong socio-political preferences. Nonetheless, the ITQ approach includes some mechanisms that can help adapt fleets to new management requirements and may be useful for wider application in the EU. This is the decoupling of fishing rights, licenses and vessels (see the

UK case study, Table 21), which transfers capacity from removed vessels to others that require more space on board for crew accommodation, and use lower emissions propulsion systems. In addition, administrations could allow vessel owners to trade their remaining rights to provide further incentives for vessel owners to remove idle capacity.

**Table 15 – Main findings Case Study Iceland, indicating management measures, outcomes and applicability in the EU context**

| Management mechanism                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Outcomes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Management mechanism                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• 1979: First experiences with individual fishing rights in late 1970s.</li> <li>• 1980s: Decommissioning programmes are implemented.</li> <li>• 1990: Full implementation of ITQs.</li> <li>• 2023: Assessment of the economic benefits of the ITQ system.</li> </ul>                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Publicly funded decommissioning schemes were used throughout the 1980s to remove redundant fleet capacity. This was replaced by a buy-out scheme funded by industry levies. In the late 1980s, Iceland introduced an entry/exit system as some of the fleet segments that were not subject to ITQs built up fleet capacity. Full implementation of ITQs, with some restrictions on quota concentration, was conducted throughout the 1990s. In 2009, a fishery not subject to the ITQ regime was implemented for hook-and-line gears due to equity considerations for coastal communities. | <p>The policy led to fleet reduction in terms of number of vessels, while the reduction in terms of GT was not clear.</p> <p>Restructuring of the fleet shifted the offshore fleet towards capitalisation with the construction of larger vessels to accommodate processing facilities and larger crews on board.</p> <p>The ITQ system is subject to a thorough revision due to increasing criticism of quota consolidation and concentration of wealth from a natural resource due to the active trading of rights among quota holders. This would result in legislative changes.</p> <p>Stocks appear to be in a healthy state.</p> | <p>Various forms of rights-based management (RBM) have existed in the EU for many years, see the studies on RBM and Ownership of Rights in EU fisheries (MRAG, 2009; European Commission, 2019c). Their characteristics vary from one Member State to another. Similar to Iceland, many impose restrictions that range from partial to full restrictions on transferability, e.g. Spain, to prevent market concentration.</p> <p>It appears that ITQs in some EU Member States have led to a degree of concentration of rights and fleet reduction in some EU fleets, particularly the more industrialised ones such as Spanish fleets operating in the waters of the North Atlantic Fisheries Organisation (NAFO).</p> <p>Similar to Iceland's initial experience with decommissioning schemes, the successive EU structural fisheries funds have funded permanent cessation of redundant fleet capacity, see section 2.3.1. Entry/exit schemes have also been in place in the EU for a number of years, allowing fleet renewal without increasing the fishing capacity (in GT and kW) of the fleet.</p> |

**Table 16 – Main findings Case Study South African Cape hake fishery, indicating management measures, outcomes and applicability in the EU context**

| Management mechanism                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Outcomes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Applicability in the EU context                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>20th century: Fishing became highly industrialised.</li> <li>Late 1990s: The government announced the possible introduction of individual rights.</li> <li>2000s: Individual non-transferable rights are implemented.</li> <li>2025: Allocation of larger quotas for small-scale fisheries in order to compensate for lost fishing opportunities and revitalise fishing communities.</li> </ul>                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <p>The fishery is managed by fishing effort in terms of days at sea, based on engine power and non-transferable individual quotas, which were designed to balance capacity with fishing opportunities. The current fishing effort system was proposed by the industry at the request of the administration. In 2025, the government increased the quotas for several species by 36% for small-scale fisheries, with the aim of facilitating inclusive growth and revitalising coastal communities.</p> | <p>Prior to the introduction of individual rights, there was a rush to build capacity with the apparent intention of obtaining larger shares of the eventual allocation of rights.</p> <p>Despite the non-transferability of individual quotas, the industry has undergone major restructuring. This is due to active mergers and acquisitions.</p> <p>There is a growing social concern in coastal communities due to the restricted access to fishing opportunities that has arisen from the consolidation of quotas in industrial companies.</p> <p>The status of the two hake stocks is healthy and was awarded the MSC label in 2002, which has since been renewed every 5 years.</p> | <p>To the best of our knowledge, a system of fishing days based on engine power and quotas has not been applied in the EU. The active consultative process used in South Africa to find solutions to capacity issues, such as the current effort system, could be replicated in the EU, and the ad hoc technical working groups of the Advisory Councils are well placed to act as participatory platforms on technical issues where the sector and scientists can discuss potential approaches. The solutions proposed can then be presented in the form of recommendations to the EU <sup>(48)</sup>.</p> |

<sup>(48)</sup> See the study on CFP Regionalization (ILVO et al., 2022).

**Table 17 – Main findings Case Study New Zealand, indicating management measures, outcomes and applicability in the EU context**

| Management mechanism                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Outcomes                                                                                                                                                                                                                                                                                                                                                                                                                                        | Applicability in the EU context                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Late 1970s: Overcapacity built up after the Extended Fisheries Jurisdiction (EFJ).</li> <li>Early 1980s: Preliminary public funding was available for boat owners to build new vessels.</li> <li>1986: ITQs are introduced in the country's main fisheries to address the problem of fleet overcapacity.</li> <li>2025: A consultation on the reform of the Fisheries Act is open, including measures to counteract discarding within the Quota Management System (QMS).</li> </ul>                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <p>The Quota Management System (QMS) consists of comprehensive, fully transferable ITQs with some concentration limits. Complementary mechanisms to the QMS are in place to strengthen compliance, traceability and bycatch reduction.</p> <p>In the 1980s public funds were devoted to build new vessels and create benefits from new fishing opportunities. No public funds have been used since the 1990s to encourage/restrict capacity expansion. Fleet decisions are seen as the sole responsibility of the private sector. The New Zealand government has recently launched a consultation on improvements to the Fisheries Act. These measures aim to address discarding issues within the QMS.</p> | <p>Vertical integration and private investments in both harvesting and processing sectors have been made after the implementation of the QMS.</p> <p>Creation of a market for fishing rights where fishermen and other citizens can trade.</p> <p>In general, the state of stocks appears to be healthy.</p> <p>However, discarding practices within the QMS has led the government to strengthen monitoring of onboard fishing activities.</p> | <p>In some EU Member States, the use of ITQs has led to concentration in some fleets and a reduction in fleet capacity. However, there is no market in rights as there is in New Zealand.</p> <p>It appears that in the EU the Producer Organisations (POs) play a key role in the exchange of rights as they reduce transaction costs. Furthermore, in the EU Member States, fishing rights have historically been tied to vessels and can generally only be acquired by professional fishers. One exceptional example of quotas not being held by active fishers was seen in the UK with the dummy licenses (49).</p> <p>In the EU Member States, there is flexibility in the management of rights, by providing flexibility to Member States to allocate national quotas to vessels in the form of individual transferable concessions as per Article 21 of regulation 1380/2013, which facilitates the adjustment of capacity to the needs of the fishing activity. One important difference between the ITQs in place in the EU and those in force in New Zealand and Iceland is the EU institutional arrangements, where POs and rules for exclusive professional trading of rights are in place, may mitigate the social impact of a wider introduction of ITQs, e.g. non-professional fishers acquiring rights and speculate with them, thus affecting the social fabric of the sector, as they would benefit from the exploitation of a resource without carrying out any fishing activity.</p> |

<sup>(49)</sup> See the Study on Ownership and Exclusive Rights of Fisheries Means of Production (MRAG et al., 2019).



**Table 18 – Main findings Case Study USA Bering Sea and Aleutian Islands (BSAI) Pollock fishery, indicating management measures, outcomes and applicability in the EU context**

| Management mechanism                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Outcomes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Applicability in the EU context                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>By the late 1980s, intense competition led the sector to ask for TACs allocation</li> <li>By the early 1990s, the Bering Sea and Aleutian Islands (BSAI) fishery experiencing a race for fish and overcapitalisation</li> <li>Late 90s, the American Fisheries Act (AFA) implemented Individual Fishing Quotas (IFQs) in the fishery</li> <li>Currently, the Alaska pollock is shared with six Community Development Quota entities, representing 65 fishing communities. IFQs can only be transferable within a fleet sector.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <p>The main management tool used by the US federal government to manage fishery is the Magnuson Stevens Act (MSA).</p> <p>By late 1980s the Community Development Quota (CDQ) programme was established to promote the development of local coastal communities, including indigenous peoples by earmarking a share of the TAC. In the 1990s, the AFA aimed to reduce fishing capacity in US fisheries by phasing out larger vessels that were considered destructive to fisheries resources through a buy-out programme. It also tightened ownership rules and imposed restrictions on foreign ownership of fishing vessels. Shares of the quotas were also allocated to fleet sectors i.e. catcher processors, high seas catcher vessels, catcher vessels that delivered to motherships, and catcher vessels that delivered to shore-based processors. These were also allowed to form cooperatives and lease quotas from the CDQ programme. The AFA also implemented an Individual Fishing Quota (IFQ) system but transfers were only allowed within a given sector.</p> | <p>The BSAI pollock fishery has been managed sustainably, achieving MSC certification in 2005 and re-certification since then.</p> <p>The prohibition of quota transfers between fleet sectors has reduced the ability of sectors to adapt to other challenges, such as the spatial-temporal distribution of pollock. The CDQs programme also have a social function, aiming to secure jobs and income for fishing communities, including indigenous people by earmarking a share of the TAC for communities.</p> <p>The federal government has been able to withdraw idle capacity with funds that are fully recovered from the fishing sector. Thus, no public funds are used to reduce overcapacity.</p> | <p>Some elements of co-management are already in place in the EU, such as the establishment of sound Total Allowable Catch (TAC) estimations and the creation of governance structures. In some Member States, POs have been given the power to pool members' quotas. POs have the possibility to look for fishing opportunities in other Member States and to request government to negotiate quota swaps between countries.</p> <p>At Member State level, POs also have the possibility to exchange quotas with other POs. The EU management system is more flexible than that applied to the BSAI pollock fishery where allocations assigned to the different fishing sectors cannot be exchanged among them</p> |

**Table 19 – Main findings Case Study China, indicating management measures, outcomes and applicability in the EU context**

| Management mechanism                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Outcomes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Applicability in the EU context                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• in 1987, the policy controlled the number of motorized vessels and engine power, with caps on horsepower by fishing zone</li> <li>• In the late 1990s, “zero-growth” or “minus-growth” policies for landings were implemented to control the increase in fleet capacity</li> <li>• In the early 2000s, a publicly funded eight-year program was implemented to scrap 30 000 vessels</li> <li>• A TAC system was implemented in 2017 through five pilot TACs</li> <li>• Mid 1990s, the sector has seen the development of the Distant Waters Fishing (DWF) fleet.</li> <li>• Early 2000, policy efforts were put in place to control expansion of the DWF fleet and their catches.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <p>The fishing licence system is the main instrument for managing and controlling the country's fleet capacity, as well as regulating fishing seasons. These restrict engine power and technical measures such as gear size and mesh sizes.</p> <p>Other fleet management instruments are economic compensation for temporary cessation of fishing activities, public funds for the decommissioning of idle vessels, entry/exit systems, and reassignment of idle fishers to the aquaculture and fishing processing. In addition, instruments were implemented with the aim of halting and reversing the historical growth in landings.</p> <p>Domestic and distant waters fishing fleet (DWFF) developed differently, as the domestic fleet was reduced, while the distant fleet development has been possible through the implementation of subsidies for the construction of vessels and fishing bases in other countries. Nonetheless, the Government of China reports recent policy efforts to control de growth of the DWF fleet, by establishing a ceiling of 3 000 fishing vessels and 2.3 million tonnes of catches. These controls were conducted in the framework of a licensing system.</p> | <p>The input control system, which imposes limitations on engine power and gear restrictions through licensing, has not produced the expected results, probably due to the inability of provincial governments to carry out sufficient inspections.</p> <p>The “zero-growth” landings and “minus-growth” landings programs (i.e. capacity reduction) have been effective in reversing the historical growth trend in Chinese landings.</p> <p>Policies to develop DWFFs and subsidies have led to a rush to build capacity, which is causing concern in developing regions due to intensive fishing close to EEZ boundaries and heavy exploitation in the high seas, particularly as China has not yet signed up the agreement on Port State Measures. The Government has established limitations on the number of vessels and its catches.</p> | <p>China's approach to fleet management differs from that of the EU in the predominance of input management measures, which require a robust enforcement system able to conduct effective inspections.</p> <p>Despite efforts to control the size of the fleet in terms of the number of vessels, even including entry/exit systems, there has been technological creep.</p> <p>There are some similarities between the Chinese and EU systems as both have a social orientation, using mechanisms to compensate fishers for temporary cessation of fishing activity, and both have also used public funds to remove excess fleet capacity.</p> <p>A relevant tool used by China is the reassignment of idle fishing labour from scrapped vessels to other activities in the fisheries value chain. This can be a good practice to be adopted in other countries provided that workers are free to decide whether or not to be mobilised to other parts of the fisheries value chain.</p> |

**Table 20 – Main findings Case Study Norway, indicating management measures, outcomes and applicability in the EU context**

| Management mechanism                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Outcomes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Applicability in the EU context                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• In the 1980s, there was a strong political commitment to protecting resources, reducing subsidies and establishing TACs.</li> <li>• Later in the 1980s, predicted stock abundance in the Barents Sea led to significant investment in fleets and onboard processing facilities.</li> <li>• In the 1990s, the entry into force of the trawl ladder system brought with it rules on the allocation of quota shares to trawlers and coastal fleets.</li> <li>• In the late 1990s, decommissioning schemes were introduced to restructure the fleet prior to the implementation of market-based mechanisms.</li> <li>• The Individual Vessel Quota (IVQ) system was introduced in 2004.</li> <li>• In 2005, permanent quotas were implemented alongside a drastic reduction in fishing capacity. However, these were then dismissed due to political changes.</li> <li>• As of 2023, the fleet comprised approximately 5 000 vessels, representing a 80% reduction since the 1980s.</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                   |
| <p>IVQs are the primary means of managing fleet activities and TACs uptakes. These quotas are not permanent, are not divisible, and have restricted transferability between groups and areas. Vessels transferring their quota must be scrapped, with the costs shared by the industry. Historically, publicly funded decommissioning schemes were the primary means of adjusting capacity in line with fishing opportunities.</p> <p>The quota distribution system allocates TACs to fleets and ensures that coastal fleets receive their fair share. This is made through the “trawl ladder” system, which divides the TAC between the coastal and the offshore fleets based on the amount of the TAC. When the TAC is low, a larger share goes to the coastal fleet; when it is high, a larger share goes to the trawler fleet.</p>                                                                                                                                                                                              | <p>Since the 1980s, managers have implemented measures to reduce the size of the fleet with the aim of safeguarding national fishing resources. Decommissioning schemes were conducted before IVQs were thoroughly implemented. Additional mechanisms were put in place to consolidate fleet reduction. The duration of the IVQ instrument have been subject to changes. But overall, the size of the fleet has consistently declined. However, Norwegian authors report that catches have not declined to the same extent, which may indicate an improvement in productivity.</p> | <p>There are a number of parallels between Norway and the EU, such as the shared aim of eliminating redundant capacity and the increased use of rights-based management in some Member States.</p> <p>In contrast, Norway no longer has fully funded decommissioning schemes or rights of permanent duration.</p> |

**Table 21 – Main findings Case Study United Kingdom, indicating management measures, outcomes and applicability in the EU context**

| Management mechanism                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Outcomes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Applicability in the EU context                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>The UK fishing fleet expanded after World War II due to rising stock levels and technological innovations, reaching its peak in the 1970s.</li> <li>From its inception in 1983 until 2021, UK fisheries were subject to the EU's Common Fisheries Policy (CFP), its management mechanisms, and structural funding.</li> <li>In the early 1990s, the UK realized the need to address fleet overcapacity. Entry/exit rules were introduced into fisheries management before this rule was put in force by the EU.</li> <li>Since the 1990s, the fleet has substantially reduced, likely due to a combination of capacity caps, decommissioning incentives, and rights-based management, in which POs play a key role.</li> <li>The Fisheries Act (2020) establishes the framework for the management of UK's fisheries as an independent coastal state. The Act involves the development of Fisheries Management Plans. A recent plan has established capacity caps on some inshore fleets.</li> <li>As of 2021, the fleet comprised around 6 000 vessels, representing a 48% reduction since the early 1990s.</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <p>The main fleet management mechanism currently in place is the Fixed Quota Allocation (FQA) system, which incentivizes quota holders to exchange quotas and adapt to fishing opportunities.</p> <p>Fisheries Management Plans (FMPs) are key instruments of the Act in pursuit of sustainability goals. With regard to fleet capacity management, a FMP (2024) has established limits on engine power for inshore vessels targeting non-quota species in the Channel Sea.</p> <p>Other mechanisms that adapt capacity to fishing possibilities include entry/exit systems, which allow individual quotas to be traded by vessels leaving the industry.</p> <p>POs play a key role in managing the quotas of their associated vessels. Vessels above 10 metres that are not part of a PO, as well as vessels below 10 metres, are not granted individual quotas; instead, they have access to a group share of the TAC.</p> <p>The Fisheries Act (2020) was enacted to establish a framework for the management of fisheries as an independent coastal state</p>                                                                                              | <p>The issue of fleet overcapacity has been addressed through fleet size reduction. Management measures appear to have been instrumental in preventing the fleet from expanding and contributing to a more sustainable exploitation of resources. Indeed, since the 1990s, the fleet has substantially reduced, likely due to a combination of capacity caps, decommissioning incentives, and rights-based management. As of 2021, the fleet comprised around 6 000 vessels, representing a reduction of 48% since the early 1990s.</p> | <p>While the UK was part of the EU, it had the autonomy to establish its own fleet management systems. It pioneered the entry/exit system. Like Member States, the UK distributed fishing opportunities to its fleets. The UK's approach had many similarities with those in force in the EU. In particular, concerning the restricted transferability of rights. One difference is that individual quota allocations only apply to vessels belonging to a PO. Another characteristic is the use of virtual entitlements, or "dummy licenses", to bridge the gap between the scrapping of a vessel and the entry of a new one.</p> |

## 6 Definition of fishing capacity

This focus of this section is to explore alternative or added elements to gross tonnage and kilowatt as metrics for measuring fishing capacity.

### 6.1 Alternative or additional elements for defining fleet capacity

Fishing capacity ceilings established in the EU Regulation 1380/2013 (Annex II) have been deemed essential for Member States to adjust fishing capacity to prevent overcapacity (i.e. overfishing and overcapitalisation) and to ensure that vessels remain economically sustainable. These ceilings set an upper boundary on the total volume and power of the fleet. The current situation in many EU fisheries showing imbalance (as identified in Section 4) would justify maintaining fleet policy rules to also prevent further increases in fishing capacity when they are associated with a better ability to catch fish resulting from technological improvements and an increased size and number of fishing gears.

Meanwhile, the CFP rules allow new fishing vessels to be built with private funding, provided that safeguards are in place to prevent the fleet's total fishing capacity from increasing to above the ceiling. This is ensured by means of the Member State specific fishing capacity ceilings and the entry/exit scheme established under the 2013 CFP. Specifically, any privately funded new fishing capacity (measured in GT and kW of vessels) entering the fleet must be compensated for by at least the same amount of capacity being withdrawn <sup>(50)</sup>. However, this rule does not prevent a possible concomitant increase in harvesting capacity (i.e. ability to catch fish).

In managing the EU fishing fleet and addressing overcapacity, alternatives to the current fishing capacity proxies (i.e. kW and GT) can be explored to determine whether complementary metrics better capture the link to harvesting capacity. This study thus lists the challenges posed by the current metrics used to define fishing capacity that may ignore differences among fishing practices. For example, those metrics are challenged by other input factors, such as the fishing gear characteristics, that help explain catching productivity. There is evidence that the ability to catch fish can still increase even if kW or GT are kept constant (see Annexes 4 and 5). Furthermore, if these other inputs beyond kW or GT are not monitored, they may allow an increase in effective capacity through input

---

<sup>(50)</sup> To avoid such assumption, previous version of the article assumed entry of new capacity should first withdraw at least 1.35 times that amount of capacity, for the entry of new vessels of more than 100 GT as stipulated Article 13(ii) in CFP 2002 (Reg No 2371/2002).

substitution (for example, when labour is substituted with some equipment while providing the same or better output). As a result, harvesting capacity may increase over the long term (Lindebo et al., 2002).

At present, Member States' fishing capacities remain below their capacity ceilings and are therefore not found to be limited by those ceilings (see Section 3). Hence, Member States have the flexibility to allocate the margin between the capacity ceilings and the actual capacity, for example, to fishing vessels with energy-efficient propulsion systems. This margin of GT and kW can be allocated to segments of the fleet in need, and there are no specific rules governing this. It is up to each Member State to decide its own allocation mechanism (Article 16(6) of 2013 CFP Regulation). However, this observation is based on the strong assumption that the reported figures for actual capacity are accurate, even though their reliability has been questioned. This issue could directly affect the actual available capacity for this purpose. In addition, Member States must use a transparent mechanism with objective criteria in the allocation of fishing opportunities (Article 17). In practice, limited information on the methods used is available <sup>(51)</sup>.

Meanwhile, according to the fishing industry, the existing constraints on fishing capacity might limit the possibility for the industry to adjust to new challenges, such as energy transition and vessel modernisation for better and safer working conditions on board fishing vessels. These issues call for evaluating possible technical adjustments to the definition of fishing capacity with new concepts, including a “decarbonisation-related tonnage” and a “safety-related tonnage”.

The need for extra space is perceived as being further exacerbated by the Landing Obligation rules implemented in 2019 (Uhlmann et al., 2019; European Commission, 2025c), which may increase pressure to increase the hold storage capacity when unmarketable fish cannot to be discarded. Safety features and improved living conditions compete for priority with elements aimed at increasing profitability, such as hold space (to store more fish) and fuel tanks (to enable vessels to operate for longer periods).

However, such alternative metrics should avoid posing a risk to creating imbalance and leading to overcapacity, particularly if the adaptations involve improvements in the fleet's ability to catch fish. This requires evaluating whether there is a weak or strong link between fishing capacity (defined as the physical characteristics of the fishing production tools) and harvesting capacity (defined as the "ability to catch fish"). Ultimately, the extent to which such a metric can complement kW and GT in managing fleet capacity depends on the extent of this

---

<sup>(51)</sup> See Communication from the Commission for enhanced transparency and good governance in the allocation of fishing opportunities by Member States: A vade mecum on the application of Articles 16 and 17 of Regulation (EU) No 1380/2013 on the Common Fisheries Policy [OJ C, C/2025/6227, 17.11.2025, ELI: <http://data.europa.eu/eli/C/2025/6227/oj>]

association. In case of a weak correlation, increasing the physical fleet capacity would not come with increased risk for overcapacity, as other factors are more at play. On the contrary, a strong correlation would require closely monitoring of the current metrics, complemented with additional or refined metrics to address the energy transition and modernisation challenges.

The review further explores how additional, or alternative metric indicators would improve the management of the balance between input capacity (describing how many fish can be caught with the full utilisation of the existing fishing capacity) and output-oriented analysis (describing the amount per stock allowed to be fished, i.e. the fishing opportunities).

An additional or alternative fishing capacity metric could also account for the 'technological creep' effect, which can increase the ability to catch fish of the fleets with different technological advancements, with the risk of overexploiting marine living resources.

### 6.1.1 Safety-, Net- and Social-related tonnage

Limitations on GT have been widely reported as restricting efforts for vessel modernisation to improve safety features and living space for the well-being of crew on fishing vessels (e.g. ERGOSPACE, 2007). Improvements to safety onboard would require installing equipment that would either reduce the space required for fishing operations or necessitate extra GT (Table 22).



**Table 22 – Safety and social tonnage related measures in fishing vessels extracted from (European Commission, 2016) and their potential impact on vessel dimensions**

| Type of safety and social measure                                          | Description                                                                                                                                                                                                                                                   | Potential impact on needing more space onboard |
|----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| Ensure vessel suitability. Avoid vessel excessive deterioration with time. | Watertight integrity. Check that hull, deck, doors etc. are in good condition to hold out the water.                                                                                                                                                          | Low                                            |
|                                                                            | Review of the stability and structural changes. Layout of fishing gear, new superstructures added on deck or other changes might affect the stability and therefore structural modifications would be necessary to maintain vessel stability in safe margins. | High                                           |
|                                                                            | Anodic protection. Review their condition to protect shaft, propeller etc.                                                                                                                                                                                    | Low                                            |
|                                                                            | Steering gear in correct conditions.                                                                                                                                                                                                                          | Moderate                                       |
|                                                                            | Pumping system revision.                                                                                                                                                                                                                                      | Low                                            |
|                                                                            | Propulsion condition check.                                                                                                                                                                                                                                   | Moderate                                       |
|                                                                            | Seawater systems. Heat exchangers, discharge valves, pipe circuits etc.                                                                                                                                                                                       | Moderate                                       |
|                                                                            | Electrics.                                                                                                                                                                                                                                                    | Low                                            |
|                                                                            | Navigation and communication systems.                                                                                                                                                                                                                         | Low                                            |
|                                                                            | Conditions for working single handed                                                                                                                                                                                                                          | Moderate                                       |
| Emergency procedures                                                       | Personal flotation device for all persons onboard.                                                                                                                                                                                                            | Moderate                                       |
|                                                                            | Fire-fighting equipment.                                                                                                                                                                                                                                      | Low                                            |
|                                                                            | Inclusion of liferafts onboard.                                                                                                                                                                                                                               | Moderate                                       |
| Stability                                                                  | Changes to increase vessel stability that might require for more space onboard. Excessive gear/fish storage above deck might negatively affect stability. Appropriate storing under deck with safety and stability purposes might require considerable space. | High                                           |
| General working areas                                                      | Keeping the boat tidy and safe. Movement around working areas should not be obstructed.                                                                                                                                                                       | Moderate                                       |
| Watchkeeping                                                               | The skipper must have provision to control the vessel and to see what is around.                                                                                                                                                                              | Low                                            |
| Accommodation                                                              | Accommodation areas of the vessels with comfortable ambient temperature and adequate ventilation.                                                                                                                                                             | High                                           |
|                                                                            | Appropriate dimensions for living space including insulation against noise and thermal insulation.                                                                                                                                                            | High                                           |
|                                                                            | Cabin space for observer onboard.                                                                                                                                                                                                                             | Moderate                                       |
| Engine room/space                                                          | Preventive maintenance, including filter changes. Revision of belts.                                                                                                                                                                                          | Low                                            |
|                                                                            | Ensure it is a safe area to move around.                                                                                                                                                                                                                      | Moderate                                       |
|                                                                            | Good ventilation to remove heat and fumes.                                                                                                                                                                                                                    | Moderate                                       |
| Boarding and leaving the vessel                                            | Ensure that your vessel is safe to cross; the deck is not slippery, handrails are in place and secure and there is an obstruction free route.                                                                                                                 | Moderate                                       |
| Fouled gear                                                                | Fishing gear, nets etc. should have enough space on deck to work safely.                                                                                                                                                                                      | Moderate                                       |

## Safety Tonnage

To encourage better working conditions, the EU developed the concept of 'safety tonnage'. This was first included as part of the Multiannual Guidance Programme IV (MAGP IV; see section 2 for a timeline of the CFP fleet policy) through a clause in Article 4(2) of Decision 97/413/EC <sup>(52)</sup>:

*'In the Multiannual Guidance Programmes for Member States, increases in capacity resulting exclusively from safety improvements shall justify, on a case by case basis, an increase by the same amount of the objectives for fleet segments where they do not increase the fishing effort of the vessels concerned.'*

This sought to limit the EU's fleet capacity through limiting GT and kW over an adjustment period between 1<sup>st</sup> January 1997 and 31<sup>st</sup> December 2001. During this time, vessels that made improvements that did not increase their 'fishing effort' could apply to the EU for additional GT.

The concept of 'safety tonnage', however, was not clearly defined and led to a number of court cases against the EU when several applications from the Irish fleet were turned down, culminating in a single case, 'Boyle and others vs. Commission' <sup>(53)</sup> (see Annex 6).

Under the 2002 CFP Regulation, capacity ceilings in GT could be increased to improve safety onboard, working conditions, or product quality under certain conditions. The 2019 evaluation (European Commission, 2019a) remarked that this possibility has not been used extensively by Member States, with the notable exception of Spain, which introduced 3,776 GT for safety reasons during the period between 1<sup>st</sup> January 2003 and 31<sup>st</sup> December 2013. Other countries either did not make use of the possibility or enabled relatively low total capacity increases for safety reasons over that same period.

Currently there are only 242 EU vessels (less than 0.5% of the total number of vessels on the EU Fleet Register) with a registered safety tonnage (i.e. GT\_safety). Most of the vessels that were originally given a GT\_safety allowance have been decommissioned (see Annex 7). If the GT\_safety information held in the EU Fleet Register is accurate or complete, it would indeed mean that no recent vessels have applied or could have applied to get extra space based on safety grounds. However, it might be worth investigating if it is possible to crosscheck national fleet registers with the EU fleet register to compare GT\_safety allowances for recent years, which would also indicate whether Member States comply with the requirements of Regulation (EU) 2017/218.

---

<sup>(52)</sup> OJ L 175, 3.7.1997, ELI: <http://data.europa.eu/eli/dec/1997/413/oj>

<sup>(53)</sup> Joined Cases T-218/03 to T-240/03 – 13 June 2006

As an example, the Royal Decree RD 2887/1998 <sup>(54)</sup> entered into force in Spain, aiming to control the “fishing effort” based on tonnage and power and to improve the safety and working conditions, and crew accommodation. By this law, new vessels under 15 metres LOA could increase their GT by a factor of 1.1 compared to a decommissioned vessel. For vessels above 15 metres, the GT could be increased by a factor between 1.35 and 1.7 depending on the type of vessel, but the volume below the deck could only be increased by 10%. This led to the addition of closed spaces, heavy cargo, fishing gear and other elements above the deck, directly raising the centre of gravity of the vessels and deteriorating their stability. As stated by Mata-Álvarez-Santullano and Souto-Iglesias (2013), the approval of this decree could be related to several incidents involving fishing vessels constructed between 1999 and 2000 and between 2004 and 2007. This example also shows that giving extra capacity to individual vessels can have unintended negative effects. Hence, there are examples where the safety at sea and the working conditions might have been degraded due to how the GT is being calculated, or the LOA being categorised with unexpected side effects.

## Social Tonnage

Although limitations on gross tonnage aim to prevent any modifications of vessels and equipment that would increase the ability to catch fish, it appears to conflict with vessel improvements that would make the vessel more ergonomic and safer without necessarily increasing their GT or kW (ERGOSPACE, 2007). As noted in European Commission (2016), there is a need to clearly define what constitutes ‘social tonnage’ and ‘safety tonnage’ and how to control for living space usage whenever there is the wish for enhancing crew accommodation above the bare minimum. This would list the pieces of equipment that contribute to the improvement in safety and working conditions (e.g. following the International Maritime Organization (IMO) fishing vessel safety code and voluntary guidelines after the 2012 Cape Town Agreement) <sup>(55)</sup>, and how to measure their GT. For example, enough separated living space and sufficiently insulated against noise, cabin space for an observer onboard, improve visibility on the deck, need for ballasts to improve vessel stability and safety-related superstructure installed above the vessel deck (e.g. deckhouses covering the deck to protect the crew against the sea and weather conditions and avoid risk of submersion).

Controlling for installation onboard fishing vessels and for initiatives aimed at adding extra safety, comfort, and quality improvements to vessels is also needed because fishing capacity limitations may incentivise non-compliance as these limitations counteract arrangements for improving working conditions and safety

---

<sup>(54)</sup> <https://www.boe.es/eli/es/rd/1998/10/23/2287>

<sup>(55)</sup> <https://www.imo.org/en/OurWork/Safety/Pages/Fishing%20Vessels-Default.aspx>

(e.g. Alvarez-Santullano and Souto-Iglesias, 2014). The control needs to ensure that such installation is fit-for-purpose.

Adding on minimum standards for safety onboard fishing vessels (Council Directive (EU) 2017(159)) would therefore be beneficial to ensure standards are upheld, should some GT to be redirected toward other uses (i.e. toward vessel modernisation). Even though few Member States have ratified the ILO Convention C188 (56) it states that sleeping rooms shall be enough to “provide adequate space and comfort for the fishers on board”, “ranging from 1.5-2 m<sup>2</sup> of floor area per person of sleeping rooms”. It also states that “the maximum number of people to occupy any sleeping room should be clearly marked in the room, and that individual berths should not be less than 198 x 80 cm on 24 metre plus vessels, or 190 x 70 cm minimum if agreed by the competent authority”. The section on Design and Construction requires headroom of 200 cm in all accommodation, or 190 cm if agreed by the competent authority.

## Net Tonnage

Some stakeholders claim that net tonnage (NT) may be a better indicator of actual fishing capacity or fish storage space. Using NT could provide a more accurate representation of a vessel's operational fishing potential, rather than just its physical size.

Net tonnage would deduct from capacity measurements the crew spaces and other parts of the vessel not holding cargo. Measures that support vessel modernisation and improve living and working conditions may compete with the space allocated for fish holds, engine rooms and fuel tanks, potentially leading to unintended side effects. For example, when fish hold volume and onboard processing facilities are limiting factors, reducing a vessel's fishing capacity may cause it to end trips early and return to port. Consequently, reserving part of the vessel's capacity for modernisation (e.g. improved accommodation or energy transition), which may reduce available storage for the catch, could be perceived as a reduction in the short-term profitability of fishing activities, unless such additional capacity is excluded from standard capacity calculations.

From this perspective, it is argued that to make room for modernisation, particularly those aimed at increasing vessel safety, it may be worthwhile measuring the capacity in terms of NT. This would involve assessing whether it could be an alternative proxy for GT and/or overall fishing capacity, provided that measuring in NT would be accounting for the cargo volume only and thereby excluding unused vessel space that is not directly linked to fishing capacity.

---

(<sup>56</sup>) Belgium, Denmark, Estonia, France, Lithuania, the Netherlands, Poland, Portugal and Spain have ratified the ILO C188 Convention. For a full list of countries see [https://normlex.ilo.org/dyn/nrmlx\\_en/f?p=1000:11300:0::NO:11300:P11300\\_INSTRUMENT\\_ID:312333](https://normlex.ilo.org/dyn/nrmlx_en/f?p=1000:11300:0::NO:11300:P11300_INSTRUMENT_ID:312333)

There is a formal and internationally recognised definition of NT, established by the International Convention on Tonnage Measurement of Ships, 1969 <sup>(57)</sup>, which is enforced by the IMO. In practice, this means applying the Convention's definition to determine the Net Tonnage of a vessel. However, for most fishing vessels, NT does not exceed 30% of their GT. Therefore, NT is arbitrary considered as  $0.3 \times \text{GT}$ , since the Convention (1969) establishes that NT shall be at least 30% of the GT.

Given NT for most fishing vessels is set at  $0.3 \times \text{GT}$  by default, including NT in the assessment of fishing capacity does not provide much additional information. If in reality most fishing vessels could have an actual NT less than  $0.3 \times \text{GT}$ , the current legal convention leads to NT values being inaccurately reported.

### 6.1.2 Other concepts for defining fishing capacity

The previous section calls for examining potential alternative concepts for measuring fishing capacity and provide an analysis of its advantages and disadvantages compared to the current approach. The extent to which it is possible to control the ability to catch fish and to avoid technological advances (leading to imbalanced fleets in the long run), is taken into consideration and reflected in the analysis.

#### Ability to catch fish

According to the 2013 CFP Regulation, only kW and GT are recognised as fleet capacity metrics. However, how those metrics relate to the actual ability to catch fish remains a challenge. The concept of 'ability to catch fish' has proven difficult to define. For example, in the 2002 reform of the CFP Regulation, Article 11(5) stipulated that 'on fishing vessels of five years of age or more, modernisation over the main deck to improve safety on board, working conditions, hygiene and product quality may increase the tonnage of the vessel, provided that such modernisation does not increase the ability of the vessel to catch fish', yet it did not define what constitutes this ability. Nevertheless, it is likely that modernisation aimed at improving 'product quality', may, in fact, enhance harvesting capacity (e.g. by installing a refrigeration room onboard, which increases the vessel's operational range).

To support this with data, auxiliary sources are needed to provide information on the gear in use, as well as the relationship between the fishing capacity of individual vessels registered in the EU and their individual 'ability to catch fish'. Such analysis would link the type, size and geometry of fishing gear these vessels can deploy for a given declared or measured input (kW, GT, days at sea, fuel

---

<sup>(57)</sup> <https://treaties.un.org/doc/Publication/UNTS/Volume%201291/volume-1291-I-21264-English.pdf>

use). Recording fishing gear characteristics in logbooks is required, as stipulated in the (EU) Control Regulation of 2023 and formulated as Article 14(2)(f): ‘the type of fishing gear, its technical specifications and dimensions, whenever systematically collected for all Member States will be valuable for estimating harvesting capacity at DCF Level 6. It will also help identify special characteristics that influence differential fishing ability and enable a more detailed breakdown by fishery (see Section 3). Hence, gear characteristics and dimensions are now mandatory information to collect alongside logbooks as stipulated by Commission Implementing Regulation (EU) 2025/2196 as specified in Annexe Tables XV and XVI.

Vessel kW is also mentioned as contributing to the “ability to catch fish” linked to vessel weight that can be displaced across the water linked the dragging force (‘pollard pull’) determining maximum gear size, and the optimal vessel speed determine how quickly the vessel can navigate between spots and also back and forth to the harbour.

### Potential fishing capacity

Another concept to manage the fleet is to recognise the “potential fishing capacity”. As recalled by Lindebo et al. (2002), FAO 1998 described the fishing capacity as “the maximum amount of fish over a period of time (year, season) that can be produced by a fishing fleet if fully utilised, given the biomass and age structure of the fish stock and the present state of the technology”. The overcapacity therefore results from an excess in potential fishing capacity compared to the target capacity which is the one required to capture the MSY.

### Fishing effort (kW.days)

A measure based on GT was introduced in 2013 of the CFP Regulation to address overfishing, as relying solely on kW was insufficient. This was due to the possibility of installing oversized engines that could be de-rated<sup>(58)</sup>, the presence of unaccounted auxiliary kW power, and discrepancies between the official and effective kW ratings. To counteract this, Italy restricts operators to use engines and register their official kW rating, only to engine types based on the manufacturer’s product range specifications and does not allow de-rated power ratings outside these specifications, which can reduce the likelihood of high-impact infringements.

---

<sup>(58)</sup> De-rating means deliberately limiting the maximum power output of an engine below its true technical capability through technical modification(s), provided that there is no possibility to increase the performance of the engine above the de-rated power after de-rating is completed.



Despite this, some European fishing fleets, particularly in the Mediterranean, have still been assessed as deploying an overall fishing effort exerting a fishing pressure up to twice the sustainable level (see STECF ad-hoc CFP monitoring reports). In this context of imbalance, fisheries management must better relate the directly managed fishing capacity metrics (kW and GT) to the harvesting capacity, which is only indirectly managed given the same capacity can lead to different catching abilities and fishing mortalities depending on the fishing effort deployed. An effective metric for harvesting capacity would need to better capture the link between kW and GT to fishing mortalities. Regarding kW, in the EU and beyond, measuring fishing effort in kW.days instead of days-at-sea alone has been a step toward capturing differences in harvesting capacities and acknowledging their impact. In addition to this, fishing gear characteristics are likely to significantly influence a fleet's ability to catch fish, and the size of the gear typically depends on the vessel's kW.

## GT categories

If current fishing capacity metrics are to be adjusted to prevent an increase in the ability to catch fish when GT is increased, it would require evaluating the feasibility of splitting GT into different categories. These categories could include GT\_safety (e.g. additional deck space), GT\_energy\_transition (e.g. space for battery storage or installing a bulbous bow or inverted bow), GT\_wellbeing (e.g. more accommodation on board for the comfort of the crew), and a GT\_harvesting\_cap (Figure 11).

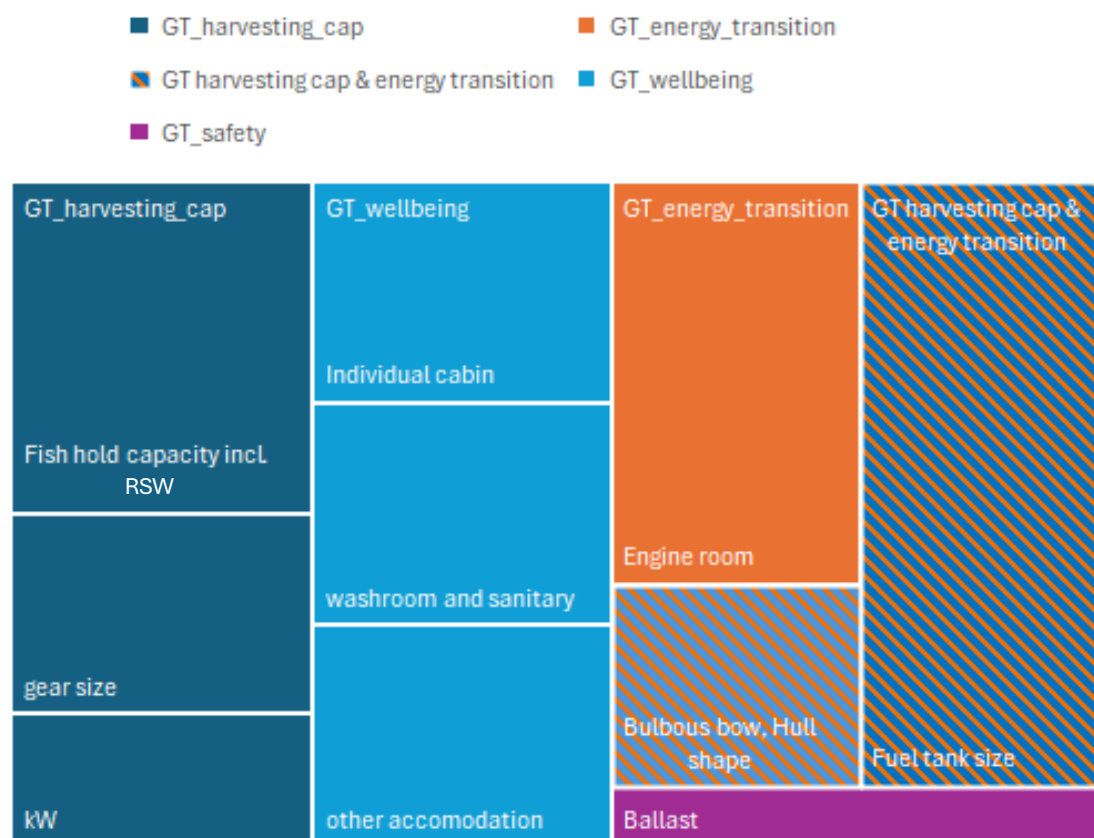
Implementing these distinctions would also require the development of clear protocols for marine surveyors <sup>(59)</sup> to assess and verify these GT components. In addition, it would require accurate reporting of the gear type and quantities used, as vessels might otherwise exploit added space to store more nets, fishing equipment, refrigerated fish hold and tanks, or to increase vessel size and mobility, all of which could inadvertently increase harvesting capacity, besides risks for safety onboard. For example, the fish hold capacity is linked to the harvesting capacity, as it constraints the duration of fishing trips. However, other conservation modes, such as fish tanks, might allow for better fish preservation, but can also reduce vessel autonomy by limiting mobility and eventually its harvesting capacity, especially when fish must be retained alive or in acceptable conditions. Fitting a bulbous bow could also allow more space for other uses.

---

<sup>(59)</sup> Marine surveyors inspect equipment intended for new or existing vessels to ensure compliance with various standards or specifications.



**Figure 11 – Hypothetical split of the overall GT of a fishing vessel into four subcomponents: GT\_energy\_transition, GT\_harvesting\_cap and GT\_safety, and GT\_wellbeing. Note that the area covered by each square is hypothetical and does not relate to any specific vessel arrangement known**



Source: Own elaboration

Onboard an individual vessel, it is apparent from Figure 11 that increasing the GT\_energy\_transition without affecting the GT\_harvesting\_cap is a challenge. The harvesting capacity of a vessel, proposed here to be approximated as its hypothetical maximum annual catch, is determined by the rates at which the fish hold is filled and emptied (see definition in Box 1, page 5). These rates depend on several factors, including the crew available to operate the vessel and process the catch, the capacity of the fish hold itself (which, once filled, could end the trip unless transshipment takes place for vessels fishing outside EU waters), the catch rates (in conjunction with production/freezing capacity in case of factory ships/freezer vessels) that dictate how quickly the hold can be filled, and the distance to the fishing grounds, which adds time to each trip.

Below is a detailed breakdown with equations that illustrate these factors:

$$\text{Harvesting capacity} = (\text{max days at sea} / \text{trip duration}) * \text{fish hold capacity}$$

where trip duration (in days) is defined as:

$$\text{Trip duration} = (\text{fish hold capacity} / \text{catch per day}) + \text{steaming time}$$

Such a dramatically simplified formulation of the harvesting capacity (for example, this formula will not hold if transshipment occurs, e.g., as for the EU's external fleet) already highlights some trade-offs with the fishing capacity. Hence, from the equations we deduce that:

a) for example, the harvesting capacity could increase if:

- The fish hold volume and other storage facilities are increased from an optimised vessel configuration or a larger vessel (i.e. larger GT). There is an increase in the internal volume of the vessel and more room for storage (for the catch and ice, or various equipment such as nets, cranes, larger drums, etc.) and more crew. For example, more room would be available if the hull shape is changed for making less resistance to water, or with a bulbous bow or an inverted bow.
- The catch rates are increased due to larger gear size (from larger kW to pull nets or travel faster, and larger space onboard to store nets). Larger catch rates could also be induced by harvested stocks in better shape, or the core of the stock distribution is closer to the shore (i.e. less steaming time required to reach the core distribution of the stocks).

b) for example, the harvesting capacity could decrease if:

- The engine room grows to the detriment of the fish hold volume and other storage facilities.
- The accommodation is made larger for each crew, and if better working conditions require more space onboard.
- The autonomy/range of the vessel is decreased from using less efficient vessel propulsion.
- The distance to reach the fishing ground increase over time from unwished stock depletion effects or changing spatial distribution of the harvested stocks.

We also note that the accommodation for crew could increase, for example if:

- The hull shape is changed for making less resistance to water, for example with a bulbous bow or an inverted bow whenever it comes with an increase of the internal volume of the vessel and more room for accommodation.

Such division of the overall GT allowance into subcomponents addressing different purposes (GT\_safety, GT\_energy\_transition, GT\_harvesting\_cap, GT\_wellbeing) should be carefully crafted as the goal would be to balance the GT\_harvesting\_cap (redefined as the maximal annual catch that a given vessel can anticipate) with the fishing opportunities, without affecting the other GT components. However, it would also account for a GT\_harvesting\_cap that is still susceptible to change depending on the accessibility and availability of the targeted stocks. For balanced fisheries it makes sense to remove several old and inefficient vessels to introduce new and more efficient ones. However, once extra

capacity enters a fishery, it would be very difficult to reduce it later if it exceeds the available fishing opportunities. This is due to the longevity of fishing vessels (25 to 40 years), which makes such adjustments cumbersome, especially if they require a brand-new purpose-built vessel or a refit. A redefinition of GT would also consider the existing legally binding country-specific capacity ceilings which are currently expressed in overall GT.

### A different way of calculating GT depending on the LOA

To standardise GT measurement, the EU adopted the method established by the 1969 London Convention. Using this approach, all Member States were required to implement a programme to convert the measurement of vessels of 15 metres LOA and over to this new basis. The required parameters outlined in Council Regulation (EC) No. 3259/94 <sup>(60)</sup>, include the vessel's LOA, vessel breadth, vessel depth, and year of construction. For vessels near the 15-metre limit, the gap between the method applied above and below this limit can result in different GT values for otherwise similar vessels (see Table 23). This discrepancy likely incentivises the design or retrofitting of vessels to stay below the 15-metre limit in order to maximise GT allowances.

Gross Tonnage is generally calculated in a standardised way under the International Convention on Tonnage Measurement of Ships (1969). However, different methods of calculating GT may apply depending on whether the vessel's LOA is less than 15 metres or greater than 15 metres. In addition, different taxation schemes based on LOA (e.g. less than 12 metres), specific provisions on LOA in the Technical Measures Regulation (EU 2019/1241) limiting access for fishing in specific areas and/or with specific gear, have led to so-called "threshold effects" within the EU fleet (see examples in Annex 4), creating incentives for abnormal vessel hull shapes and vessels with degraded performance, resulting in reduced safety due to lower stability at sea and non-optimal working conditions. This differential calculation of GT makes it more advantageous to maintain or reduce vessel length to below 15 metres to stay below this threshold and get more GT, often at the expense of onboard ergonomics (ERGOSPACE, 2007). As a consequence, vessel hull forms have changed over time to give less priority to hydrodynamic efficiency and more to maximising the deck area available within a given vessel length. The reduction in speed due to a shorter vessel hull has been partially offset by using more powerful engines, which in turn also burn more fuel (Johnson et al. 2022). Hence, there is increasing pressure within the sector to revise vessel size categorisation criteria to eliminate these threshold effects <sup>(61)</sup>. However, such effects are likely to persist

---

<sup>(60)</sup> OJ L 339, 29.12.1994, ELI: <http://data.europa.eu/eli/reg/1994/3259/oj>

<sup>(61)</sup> Gross Tonnage and Propulsion Power ceilings - Grant agreement No VP/2016/001/0047

regardless of how LOA categories are redefined, as any upper limit will always be seen as a constraint.

Vessel length requirements are not part of the current capacity indicators GT and kW used under the CFP. However, a vessel's overall GT is influenced by the LOA. One potential improvement to fleet policy would be to revise the current GT calculation method to remove the negative incentive to widen vessels instead of lengthening them. This would encourage more hydrodynamic hull designs, addressing the so-called “threshold effects” and improving fuel efficiency. Currently, a portion of the EU fleet may have suboptimal hull shapes caused by these threshold effects on the LOA, leading to an increase in vessels' resistance to water and, consequently increasing fuel consumption. It is likely that the engine power required to propulse this reshaped vessel will also be lower than her shorter equivalent (as a longer, narrower hull generally reduces wavemaking resistance significantly, e.g. Lindstad and Eskeland 2015).

**Table 23 – Applying GT calculation from the formula given in Council Regulation (EC) No. 3259/94 to two hypothetical vessels of 18 and 24 m in length in overall (LOA), with vessel characteristics as defined by Regulation (EU) 2017/1130 <sup>(62)</sup>**

| LOA (m) | Breadth (m) | Depth (m) | GT (if formula <15m would apply) | GT (applying >15m formula) | % difference if <15m formula would apply |
|---------|-------------|-----------|----------------------------------|----------------------------|------------------------------------------|
| 18      | 5.5         | 2         | 46.50 GT                         | 50 GT                      | -7.0%                                    |
| 24      | 5.5         | 2         | 73 GT                            | 96 GT                      | -24%                                     |

## 6.2 Assessing the feasibility of increasing a vessel's GT and/or kW without increasing its ability to catch fish

In recent years, stakeholders have been criticising that the fleet capacity ceilings hinder growth, innovation, safety and renewal of an ageing fleet <sup>(63)</sup>. However, it remains to be seen if it is possible to change these safeguards without increasing the overall ability to catch fish. This section aims to assess the feasibility to increase a vessel's GT and/or kW without increasing its ability to catch fish.

<sup>(62)</sup> OJ L 169, 30.6.2017, ELI: <http://data.europa.eu/eli/reg/2017/1130/oj>

<sup>(63)</sup> The 2022 common fisheries policy and common market organisation reports: your opinion counts – take part in targeted consultations: [https://oceans-and-fisheries.ec.europa.eu/news/2022-common-fisheries-policy-and-common-market-organisation-reports-your-opinion-counts-take-part-2021-12-17\\_en](https://oceans-and-fisheries.ec.europa.eu/news/2022-common-fisheries-policy-and-common-market-organisation-reports-your-opinion-counts-take-part-2021-12-17_en).

### 6.2.1 Evaluate the degree of correlation between fishing capacity (GT or kW) and harvesting capacity (“ability to catch fish”)

Previous studies have documented the strength of the link between fishing capacity and harvesting capacity, which can vary depending on the vessel's length (i.e. unexpectedly, larger vessels do not always tow larger nets, Reid et al. 2011, see Annex 8). Indeed, according to an EC Communication in 2007, there are two major ways to develop a control strategy of the fishing capacity and effort indicators under the CFP (European Commission, 2007): i) vessel characteristics; and ii) fishing gear characteristics. In addition, iii) the management measures in place will also influence the development of the harvesting capacity.

#### Vessel characteristics

The strategy so far is to rely on kW and GT as control mechanisms (see Annex 4) of the fishing capacity. If a strong correlation is found between kW and GT and the ability to catch fish, a strategy to accommodate the safety and energy transition challenges is to define some fleet capacity metrics independent of the fishing capacity (i.e. some metrics that link to the social- net- or safety related tonnages concept).

However, as the actual GT and kW of the EU fleets have gradually decreased over time, the gap between the capacity ceilings and actual fleet capacity in terms of GT and kW has widened for most EU Member States (see Figure 2, Section 3). The limits set for the national fishing fleet capacity expressed in kW and GT, likely no longer correspond with the required balance to available fishing opportunities, even if the “entry/exit” system were to work to adjust it.

This indicates a weak relationship between the fleet capacity, measured in GT or kW, and the “ability to catch fish” of a vessel, given the current imbalanced situations reported in the EU. Therefore, the strategy should be to search for alternative metrics beyond kW or GT, since changes in these metrics may not meaningfully reflect shifts in fishing pressure if other factors (e.g. gear characteristics), are the true drivers. These characteristics would thus need to be collected, monitored and controlled to achieve a proper balance. This indicates a substantial mismatch between the nominal fishing capacity and the corresponding effective harvesting capacity (i.e. the vessel's “ability to catch fish”). If a strong correlation is found, the strategy is to continue relying on kW and GT as control mechanisms (see Annex 4). In this case addressing safety and energy transition challenges would require a defining the fleet capacity metrics independent of the fishing capacity.

## Gear characteristics

Previous studies collated information about the effect of gear characteristics in determining the harvesting capacity. Such relationships were based on previous studies of individual vessel data (EU FP6 TECTAC, CAFÉ <sup>(64)</sup> or DEGREE, Eigaard et al. 2011, 2014 and 2016), that used national logbooks to investigate what are the factors affecting the ability to catch fish in each fishery or among fisheries. Examples of such relationships are provided in Annex 5.

These studies also recognised that increased auxiliary power (not included in the definition of the capacity in kW; see EEC No 2930/86 <sup>(65)</sup> repealed by Regulation (EU) 2017/1130 <sup>(66)</sup>) has allowed the use of bigger nets and made fishing possible at great depths (by powering electric winches), as well as powering Refrigerated Sea Water (RSW) tanks onboard or electric fish pumps (Annex 9).

## Management regime characteristics

The harvesting capacity and the relative impact of an increase of fishing capacity is also likely to depend on the type of management regime in place (see also Section 7.1):

- **For a quota regime** little correlation might be expected between main engine power (kW) and harvesting capacity if the fishing vessels operate with quotas. With an increase in the engine power under the implementation of catch limits, vessels would reach fishing grounds faster, trips would be shorter (less time exposed to sea conditions), but the catches would remain the same (volume limited by quota, and assuming full compliance and catch declared correctly, full compliance to the Landing Obligation, and no technical interactions among fisheries), and therefore the kW in use would be decoupled for a large part from the ability to catch fish. In practice, a strong correlation might be found, however, as soon as the “race for fish” is determinant, to be the first at fishing, the quotas can incentivise bigger vessels and bigger engines to fish longer, further away or deeper, and with bigger nets, with increased risks of catching more unwanted catches and incentivising misreporting practices.
- **Vessels operating primarily without quotas** (e.g. effort regime in the Mediterranean, or targeting non-quota species in the NAO), there may

---

<sup>(64)</sup> [ices.dk/about-ICES/projects/EU-RFP/EU%20Repository/CAF%C3%89/FP6%20CAF%C3%89%20Final%20Activity%20Report.pdf](https://ices.dk/about-ICES/projects/EU-RFP/EU%20Repository/CAF%C3%89/FP6%20CAF%C3%89%20Final%20Activity%20Report.pdf)

<sup>(65)</sup> OJ L 274, 25.9.1986, ELI: <http://data.europa.eu/eli/reg/1986/2930/oj>

<sup>(66)</sup> The term 'fishing capacity' means a vessel's tonnage in GT (Gross Tonnage) and its power in kW (Kilowatt) as defined in Articles 4 and 5 of Council Regulation (EEC) No 2930/86



exist a stronger correlation between the engine power (kW) increment and the GT and the harvesting capacity, since vessels could cover longer distances in a shorter time, going faster and operate with bigger nets or other fishing gears, reaching higher catch rates, as well as storing more catch. If an effort management is set to mitigate such an effect, e.g., whenever limiting the number of days allowed, or constraining the trip pattern to daily trips (for example, in the multiannual plan for fisheries exploiting demersal stocks in the Western Mediterranean – the West Med plan), it might in practice reinforce such correlation as a limitation on volume caught is lacking.

- **Vessels conducting mixed fisheries**, correlation between the fishing and the harvesting capacity is assumed high, as in mixed fisheries situations (typical of demersal fisheries where actual catches risk more mismatching fishing opportunities whenever demersal species co-exist and are caught all together), a larger fishing capacity would apply a larger pressure on mixed species, non-target species, or non-quotas species.

### 6.2.2 Technological advances affecting the harvesting capacity

The effects of technological improvements must be taken into consideration and reflected in the analysis when assessing the feasibility to increase a vessel's GT and/or kW without increasing its ability to catch fish.

#### Technological advancement factors

At the fleet level, harvesting capacity increases over time when technological improvements occur ("technological creep"). Such an increase in the "ability to catch fish" results from i) a gain in engine kW and fuel efficiency, ii) improved gear performance (e.g. size of the net, net rigging, net material, hydraulic winches, horizontal opening in trawl nets, headline length, number of net drums), iii) improving fishing strategies (e.g. shifting to different depth stratum, fishing grounds, or upgraded navigation equipment); and iv) technical adaptations aiming to increase the economic performance of vessels' engines, such as the nozzle propulsion systems that increased fuel savings, by up to 20% (Damalas et al., 2014).

Increasing economic performance by lowering fuel expenses might lead to a greater "ability to catch fish" if such expenses were the only limiting factor. An indicator of technological improvement is the amount of fuel consumed per catch tonne (i.e. fuel use intensity, FUI). The FUI has been in constant decrease in the last two decades, for different fisheries such as the purse seiners operating in the Indian Ocean (Chassot et al., 2021) or the different fishing vessels of the Norwegian fisheries (Jafarzadeh et al., 2016), in part given by the technological



advancements (e.g. when more operations are done per fishing day by a vessel, or more catch per operation, or less fuel used, etc.). Hence, substituting an old vessel with a new one or modernising an existing vessel are both changes expected to increase the harvesting capacity. Depending on the fishing gear applied, fuel expenses are very important, and fishers decide on their fishing strategy taking them into account. Fishers may limit their fishing days because of the fuel costs.

Such an ability to catch fish per unit of fishing effort could also decrease depending on the type of fishing techniques the reallocated fishing capacity is directed to, as the same species can also be caught using different fishing techniques with different efficiency (e.g. Danish seine vs bottom trawling vs bottom set nets). Indeed, the harvesting capacity varies among fleet segments/fisheries/vessels, especially between vessels of different sizes, and increases on average with vessel length, and also because of more storage and processing facilities onboard. Larger storage space may mean longer fishing trips. Large high-seas freezer trawlers and factory vessels have a complete fish processing plant on board and large storage facilities for frozen fish filets. In addition, outside EU waters they usually make use of transshipments to transfer catches. In the future, with changes in available species, changing market requirements, and improvements in fish processing, more space may be necessary. Such extra space may come with a better ability to catch fish.

Advances in electronic and computer technologies have also significantly increased harvesting capacity, enabling fishers to easily locate fish, or, for example, fishing closer to shipwrecks without risking losing the nets. Skipper's experience and literacy in using outcomes of research in ecosystem conservation – such as satellite maps and high-definition fish distribution models – have been leveraged by companies offering fishing aid products. Hence, the harvesting capacity can also vary depending on the individual skipper's ability to use gears, fish behaviour and selectivity of the gears, electronic onboard equipment and weather conditions that vessels may encounter. This progress has led to a substantial rise in the ability to catch fish.

### **Annual percentage increase**

In a previous CFP revision, the entry/exit scheme (Article 13 of 2002 CFP Regulation) stipulated that at least 1.35 times the capacity had to be withdrawn before new capacity could be added to the fleet – specifically if the new vessel would exceed 100 GT. This measure was designed to counteract the effects of technological creep.

The likely annual percentage increase in the ability to catch fish may be included in guidelines as a corrective measure of fishing capacity measurement. Technological advances such as GPS, echo sounders or enhancements in fishing gears may have accounted an average increase of 2% per year in fishing

capacity according to Palomares and Pauly (2019). These authors analysed 51 different case studies, covering periods from 4 to 129 years. According to this result, the fishing capacity of commercial fishing could double in 35 years due to technological creep. Other studies estimated up to a 3% annual increase in the harvesting capacity given by the technological advances (Auditors, 2011). Damalas et al. (2014) estimated the effect of technological creep in the Greek demersal fleet to be less than 1% over the period 1994-2008. Negative values were also reported, likely due to overexploitation, indicating that when fishing on overexploited stocks the technological creep may be underestimated.

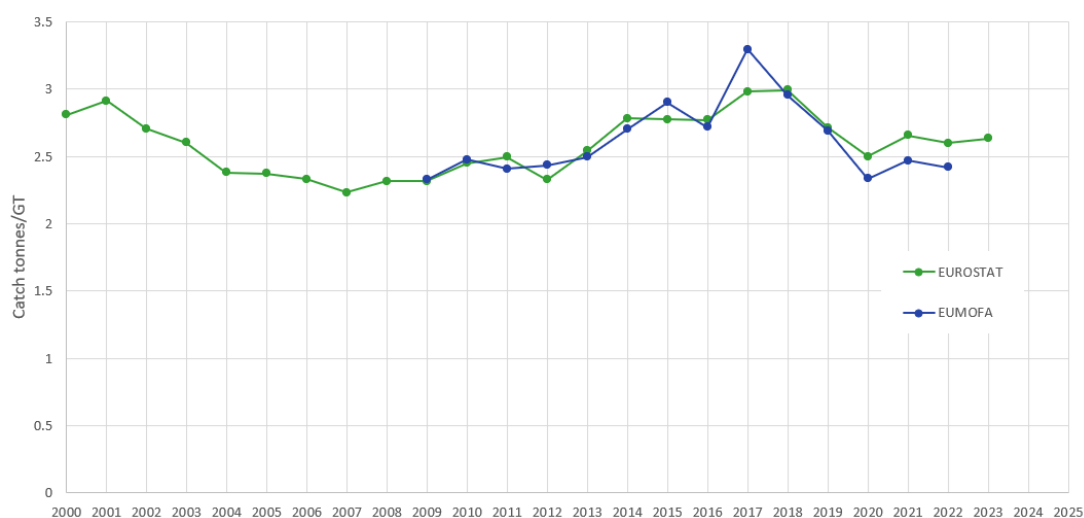
### **Pattern in technological advances**

Studies have shown that harvesting capacity changes with time and technological development. The most frequent pattern in fisheries-related technological advance seems to be shorter, relatively stable periods with gradual increases interrupted by one or two large year-to-year jumps (Marchal et al., 2002; O'Neill and Leigh, 2007).

### **EU wide evaluation of annual increase in harvesting capacity**

An overall decreasing trend in total catches has been observed since the 2000s, with catches declining from 5.9 million tonnes in 2001 to 3.3 million tonnes in 2023 (Eurostat, 2024). This trend has also been reported by the European Market Observatory for Fisheries and Aquaculture Products (EUMOFA, 2025). At the same time, a gradual reduction in the total GT and kW of the Member States' fleets has been observed since the 2000s. If technological creeping is increasing, more tonnes of fish caught per GT should be expected over time. Indeed, two increasing periods of increase in this ratio (catch tones/GT) can be identified: 2007-2018 and 2021-2023 (Figure 12). However, some declining periods are also evident, which are likely associated with phases of overexploitation. This suggests the need for a more detailed and disaggregated analysis of the technological creeping effect, taking into account fleet segments and different vessel types.

Quantitative analysis of changes in the ability to catch fish over time can support corrective statistical analysis, such as CPUE standardisation (e.g. Marchal et al. 2001, Eigaard et al. 2014, Damalas et al. 2014, Mahévas et al. 2011, Hoyle et al. 2024). This can be achieved by examining time series data for DCF Level 6 fisheries to adjust trends in fishing capacity relative to changes in harvesting capacity (see Annex 10 on standardisation of the fleet capacity with a GLM statistical modelling). Such analyses would deserve being repeated with more disaggregated data, if national logbook data and national fleet registers become available, potentially providing more detailed information than the EU Fleet Register, such as the targeting behaviour, soaking time, and other operational parameters.

**Figure 12 – Time series of catch per GT, all EU fleet**

### Automatic mitigation of technological advances with a corrective factor

The European Commission has acknowledged that harvesting capacity tends to increase over time and disregarding such an increase can result in excess fishing capacity (European Commission, 2009b). While technological improvements can enhance more selective fishing, technological creep also poses challenges for managing the risk of overfishing and increases the incidental catch of non-target species that lack commercial value.

Historically, “input control” (e.g. effort management) of EU fisheries has been implemented through Multi-Annual Guidance Programmes and the “entry/exit regime” to counteract this effect by reducing and limiting fishing capacity. The European Commission (European Commission, 2009b) suggested that an annual increase of 3% in effective fishing capacity is a realistic estimate. Such an increase would have more than offset the substantial reduction in nominal EU fleet capacity achieved through large-scale policies targeting fishing capacity and effort reductions from 1992 to 2008 (Eigaard et al. 2014). However, no automatic reduction for technological creep has been implemented so far.

## 6.3 Vessel modernisation for energy transition

Reduction in fuel consumption and energy transition call for implementing new fishing technologies to complement or substitute the existing ones <sup>(67)</sup>.

A previous stakeholder consultation (European Commission, 2022a) identified current regulations as one of the main barriers to the uptake of new technologies,

<sup>(67)</sup> [https://maritime-forum.ec.europa.eu/theme/blue-economy-and-fisheries/blue-energy/energy-transition-partnership\\_en](https://maritime-forum.ec.europa.eu/theme/blue-economy-and-fisheries/blue-energy/energy-transition-partnership_en)

as regulations could limit the opportunities for improvements supported by the EU. The current limitations on vessel fishing capacity are seen as having two side effects: i) they have led to the development of non-optimal vessels in the past; and ii) they may hinder the adaptation to accommodate new technologies necessary for energy transition.

At the same time, some stakeholders (e.g. environmental NGOs) argue that fuel subsidies or any measures that enhance fishing capacity could delay adaptation to rising operational costs and contribute to unsustainable fishing practices. Some fisheries would not be profitable without subsidies and subsidies also ensure that enough revenue is generated for the vessel crew to be paid (given the particular remuneration by share system in the fishing sector). However, reducing the cost of fuel reduces the incentive to use it efficiently, potentially undermining the sector's productivity and reducing investment in emission-reducing technologies (OECD, 2025).

A recent EU techno-economic analysis (European Commission, 2024c) identified multiple technological solutions to reduce the carbon footprint of the fishing fleet. However, these solutions vary in terms of technological readiness, fuel storage requirements, and the geographical range of exploration (i.e. autonomy) they offer to fishing vessels. Depending on these factors, the space required on board a vessel may differ, leading to variations in how GT and kW are used to provide the same service as the baseline configuration. Consequently, implementing some of these solutions, while keeping the same individual vessel capacity, may reduce a vessel's ability to catch the same quantity of fish per trip.

Among the vessel improvements identified that would make the vessel more energy-efficient without necessarily increasing their GT or kW are some technical innovations related to propulsion and engine systems (Table 24).

**Table 24 – Summary elaborated from the EU techno-economic analysis 2024**

Technological Readiness Levels (TRL) are a system for assessing the maturity of the technology, where TRL 1 being the lowest (basic research) and TR 9 being the highest (full scale deployment)

| Categories                                 | Innovations                                     | Fossil fuel saving potential | TRL 2023 | Extra space needed           |
|--------------------------------------------|-------------------------------------------------|------------------------------|----------|------------------------------|
| Technical measures for propulsion & engine | Electric onboard consumers instead of hydraulic | 10-15%                       | 9        | Moving of cargo space likely |
|                                            | Frequency converters                            | 0-2%                         | 9        | No                           |
|                                            | Waste heat recovery systems                     | 10%                          | 9        | Yes                          |
|                                            | Oil filtration combined with frequency drive    | 90% of oil                   | 9        | Uncertain                    |
|                                            | On shore electricity                            | 100% when at port            | 9        | Uncertain                    |
|                                            | Large propellor, stempost, nozzle               | 10-20%                       | 9        | No                           |

| Categories                         | Innovations                             | Fossil fuel saving potential | TRL 2023 | Extra space needed                                                                                             |
|------------------------------------|-----------------------------------------|------------------------------|----------|----------------------------------------------------------------------------------------------------------------|
| Vessel design and vessel operation | Antifouling                             | 5-10%                        | 9        | No                                                                                                             |
|                                    | Pre- and post-swirl fins, stators       | 0.5-5%                       | 9        | ?                                                                                                              |
|                                    | Antiroll systems                        | Uncertain                    | 9        | ?                                                                                                              |
|                                    | Propeller-rudder upgrade                | 5%                           | 9        | No                                                                                                             |
|                                    | Improved hull design                    | 4-30%                        | 9        | Yes                                                                                                            |
|                                    | Apply air lubrication system            | 3-15%                        | 9        | No                                                                                                             |
|                                    | Energy efficient lighting               | 0.25-5% on electricity       | 9        | No                                                                                                             |
| Alternative fuels                  | Electric                                | 100%                         | 4-5      | Yes, as increasing the weight and size of the vessel                                                           |
|                                    | Diesel-electric or hybrid               | 10-25%                       | 9        | Yes, increased space requirement                                                                               |
|                                    | Biodiesel                               | 40-96%                       | 4-9      | More bunkering needed given lower energy density                                                               |
|                                    | Biocrudes                               | 100%                         | 2-9      | ?                                                                                                              |
|                                    | Methanol                                | 100%                         | 8-9      | More on-board storage space is needed as methanol has a lower heating value                                    |
|                                    | Ethanol                                 | 100%                         | 4-6      | 1 litre gasoline=0.65 litre bioethanol based on power density                                                  |
|                                    | Ammonia                                 | 100%                         | 7-9      | More bunkering or large fuel tanks are needed due to lower energy density and to ensure insulation and safety. |
|                                    | LNG                                     | 25%                          | 9        | LNG has a lower energy density than diesel (circa 1/3)                                                         |
|                                    | Hydrogen                                | 100%                         | 4-9      | Tank volume is almost eight times more than that diesel.                                                       |
| Wind assistance                    | Kite                                    | 1-25%                        | 7-9      | Uncertain                                                                                                      |
|                                    | Suction wings                           | 5-25%                        | 8-9      | Yes, need deck space                                                                                           |
|                                    | Sails                                   | 5-25%                        | 7-9      | Yes, need deck space                                                                                           |
|                                    | Wind turbine                            | 0-2%                         | 8-9      | Not much needed                                                                                                |
|                                    | Flettner rotor                          | 3-20%                        | 9        | Not much needed                                                                                                |
| Fishing gear                       | Sumwing beam trawl                      | 11-30%                       | 9        | Not needed                                                                                                     |
|                                    | Outrigging beam trawl nets              | 35-45%                       | 9        | Not needed                                                                                                     |
|                                    | Twinrig beam trawl nets                 | 25%                          | 9        | Not needed                                                                                                     |
|                                    | Alternative trawl doors                 | 20%                          | 5-9      | Not needed                                                                                                     |
|                                    | Using sledges with trawl                | 15%                          | 9        | Not needed                                                                                                     |
|                                    | From active to passive gear             | 90%                          | 9        | Uncertain, but smaller engine to operate the fishing takes less space                                          |
|                                    | Helix spiral trawling for beam trawlers | 45%                          | 5        | Not needed                                                                                                     |
|                                    | Lighter nets                            | 40%                          | 9        | Not needed                                                                                                     |
|                                    | Alternative net designs                 | 20%                          | 1-9      | Not needed                                                                                                     |
| Onboard processing                 | Multistage mono-block pumps             | 0.5%                         | 9        | Not needed                                                                                                     |

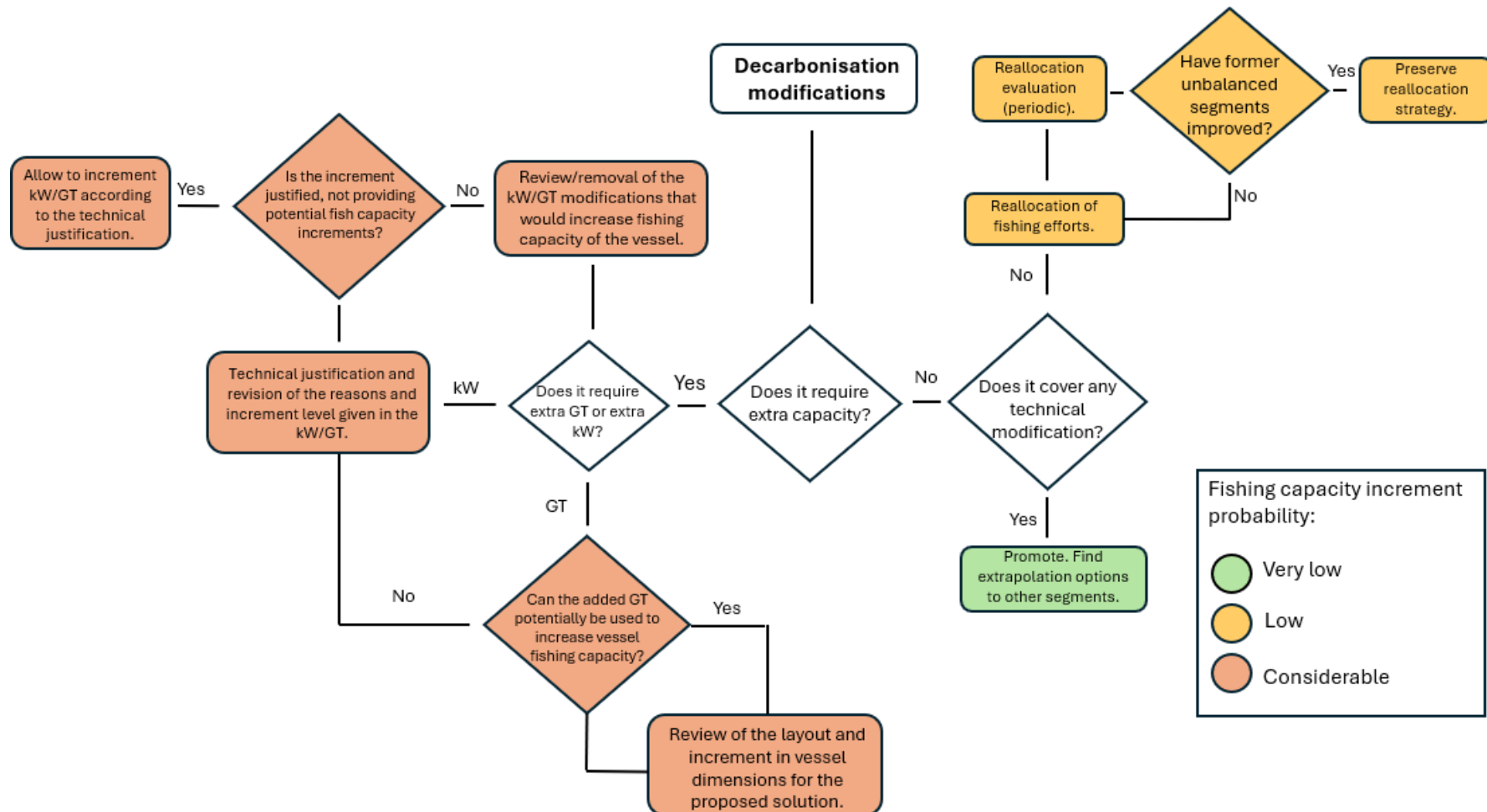
| Categories            | Innovations                                                  | Fossil fuel saving potential | TRL 2023 | Extra space needed                                                               |
|-----------------------|--------------------------------------------------------------|------------------------------|----------|----------------------------------------------------------------------------------|
| Facilitating measures | Cogged V-Belt                                                | 2-5% on electricity          | 9        | Not needed                                                                       |
|                       | Using natural refrigerants                                   | 20%                          | 9        | Uncertain                                                                        |
|                       | Slow or smart steaming                                       | 15-40%                       | 9        | Not needed, unless increasing ability to catch fish given reduced effective time |
|                       | Route planning system devices                                | 10%                          | 7-8      | Not needed                                                                       |
|                       | Energy audit                                                 | Variable                     | 9        | Not needed                                                                       |
|                       | On-board energy monitoring system                            | 10%                          | 9        | Not needed                                                                       |
|                       | Integrated digital energy and monitoring system e.g. Bluebox | 5-10%                        | 9        | Not needed                                                                       |

Some other improvements would require extra space, such as vessel design and vessel operations listed in the table above. For example, installing a dual system propeller, which could contribute to fuel cost savings per unit of effort, may necessitate a larger engine room. However, implementing these fossil fuel savings potential might, for some of them (i.e. the ones not substituting for alternative fuel), also allow for the installation of a smaller fuel tank, thereby freeing some cargo space.

Depending on the type of solution, the likelihood of requiring extra space, and thus changes in fishing capacity, is different. Solutions that would increase a vessel's kW or GT should be assessed on a case-by-case basis (Figure 13). Such assessments should involve consultations with naval architects, marine engineers or other independent entities to technically justify that any increase in vessel capacity is solely due the space needed for energy transition solutions. These justifications should be further reviewed by independent technical experts in the field.

In the following sub-sections, we examine in more detail the different possibilities.

**Figure 13 – A decision flow chart under different probabilities (very low, low, considerable) for requiring extra vessel capacity likely needed in addressing energy transition challenges**



Source: Own elaboration



### 6.3.1 Improving energy efficiency

Short-term energy transition solutions that improve energy efficiency, excluding more radical changes such as switching to alternative propulsion systems or redesigning new hull shapes for new vessels (see 6.3.2) are unlikely to require additional space onboard (European Commission, 2024c). Hence, the European Commission's techno-economic analysis (2024c) evaluated a range of energy efficiency innovative solutions, all of which demonstrated high technological readiness levels (TRL).

Energy-efficient solutions that can be implemented on existing vessels would include: the use of biodiesel, waste-heat recovery systems, propeller-rudder upgrades, larger propellers, nozzle and optimised sterns, electric-powered on-board equipment (e.g. for cranes and winches), frequency converters, oil filtration systems, anti-fouling measures, shore-side electricity supply, fins and stators, bulbous bows, and anti-roll systems or stabiliser fins.

New vessel designs or retrofits may include adding a bulbous bow (as a protuberant bulb) to the hull of the vessel or installing hybrid/electric propulsion systems. These modifications can reduce fuel consumption but may require an increase in the GT if using some GT dedicated to other utilisation is perceived as a drawback or may impair the safety on board <sup>(68)</sup>. For example, the addition of a bulbous bow may require an increase of 3-4 m<sup>3</sup> to the hull volume. However, such changes are currently prohibited under the CFP regulation due to the overall and individual 'GT/kW/fishing effort' cap requirement as stipulated in Articles 22 and 23. However, if eligible, exemptions may be made under Article 19 of the EMFAF, which allows for capacity increases only if an equivalent amount of capacity is first removed.

When assessing the potential resistance from the fishing sector or Member States (i.e. political risk), to adopting new technologies or practices, as well as assessing their potential for adverse environmental impacts beyond carbon emissions, such as pollution, noise, or the risk of overfishing (i.e. environmental risk), these solutions were found to be feasible and associated with low political and environmental risks (see the complete inventory of solutions in the EC techno-economic study).

Improving the energy efficiency of fishing gears also offers promising potential without altering their catchability. In addition, making fishing gear more selective

---

<sup>(68)</sup> Overall, the change of the engine itself might not require much more space, but the storage systems for alternative fuels, the addition of batteries or other technologies might need more space. For example, a methanol engine could be similar in dimensions when compared to a marine gasoil engine (MGO), but the storage of methanol requires twice the space required for MGO, hence possibly requiring more GT\_energy\_transition, and possibly extra safety facilities onboard.

in targeting commercial or marketable species can enhance sustainability, reduce fuel use intensity (i.e. fuel use per kilogramme of catch), and promoting healthier fish stocks and ecosystems. However, for certain fishing techniques, such as bottom trawling, it remains uncertain whether fuel consumption can be reduced without negatively affecting the catchability of the gear (STOA, 2024).

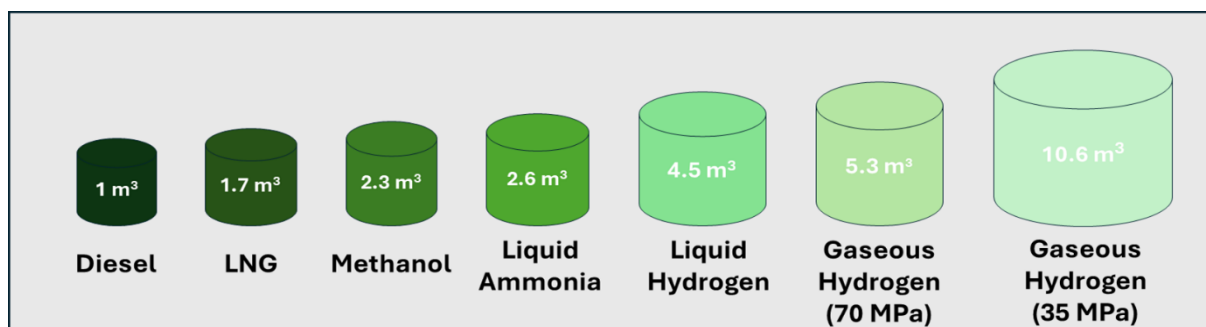
To address the challenges of energy transition, where energy efficiency improvements may require additional vessel capacity or enhance fishing efficiency, it is essential to investigate the extent to which capacity metrics (GT, kW) and other vessel characteristics (LOA) are linked to the “ability to catch fish” (see Section 6.2). Technical solutions that do not require an increase in vessel capacity generally pose a low risk of increasing overall fishing capacity. These types of short-term changes, which help to reduce fuel consumption, could be promoted while carefully monitoring any potential increase in fishing capacity risks.

### 6.3.2 Using alternative fuels for the vessel propulsion

The EU techno-economic analysis (European Commission, 2024c) further identified the requirements for fleet renewal and the existing solutions to address future challenges in fisheries development. These requirements include retrofitting existing vessels or designing larger ones to operate with new energy sources and greener fuels. Knowledge and development of alternative fuels for propulsion, such as LNG (liquified natural gas), methanol, hydrogen (produced through water electrolysis) and electrification, is growing (SINTEF Ocean, 2021; IRENA & Methanol Institute, 2021; European Commission, 2023c).

However, these alternative fuels have lower volumetric energy density than diesel, requiring more onboard space for larger engines and fuel tanks, as summarised in Table 25. For example, electrification requires a much larger space onboard vessels than energy storage via conventional diesel (FIS, 2023; Figure 14).

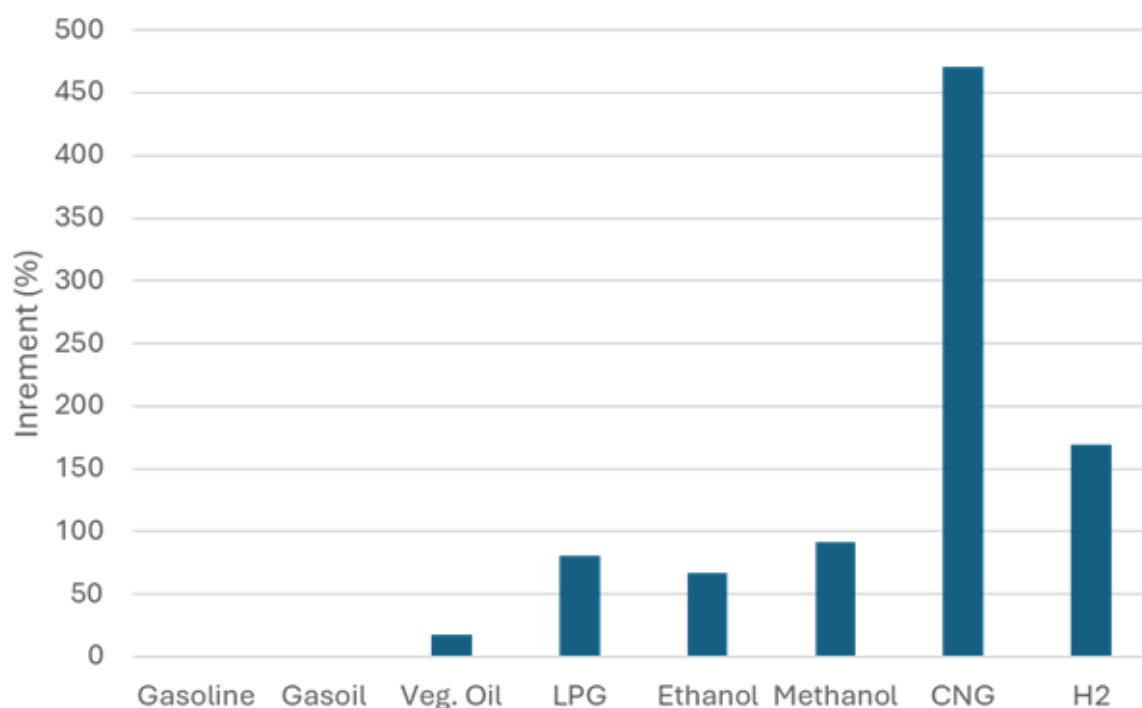
Thus, maintaining the same vessel GT, but using alternative greener fuels with lower energy density, may reduce available space and performance. Moreover, the installation of some energy transition technologies may increase vessel weight (Figure 15). For instance, converting a 15 m trawler to methanol could increase the weight of the empty vessel (e.g. the weight of the empty vessel with machinery and equipment) by 21.4% compared to using conventional marine gasoil. In the case of LNG, the extra vessel weight could be up to 54% (FIS, 2023).

**Figure 14 – Fuel volume taken by 10 megawatt-hour (MWh) of energy for different fuels**

Source: Estimates by Panic et al. 2022 for energy densities of: Diesel, LNG (liquified natural gas), Methanol, Liquid and gaseous hydrogens, and Foretich et al. 2021 for Liquid ammonia)

**Figure 15 - Percentage of extra weight given in a 55-litre gasoline tank when considering different alternative fuels**

Note that these increments are only based on the weight of the tank <sup>(69)</sup>. LPG (liquified petroleum gas), CNG (compressed natural gas), H2 (Hydrogen)



Source: Martins and Brito (2020)

<sup>(69)</sup> Alternative fuels, some of them provide much more MWh per kg than marine gasoil. For example: hydrogen has a calorific value of 120-140 MWh/kg, LNG has 50-55 MWh/kg, while diesel has 45.6 MWh/kg. If we only observe the fuel itself, there exist some fuels with higher kWh per kg than marine gasoil (for same kWh they might need less weight). However, the increment in weight does not come only from the fuel, but also from the tanks and other necessary equipment to install alternative fuels.

According to Damian et al. (2022), one of the main drawbacks of hybrid power systems in vessels, apart from the large space needed for the installation of components such as Energy Storage Systems (ESS), is the potential increase in vessel weight. Similarly, Gray et al. (2021) found that energy transition solutions such as lithium-ion batteries, methanol or hydrogen require additional space and add more weight than conventional diesel systems to achieve equivalent range, based on their study of cargo ships.

In the fishing sector this could also require additional kW compared to the conventional propulsion systems in some cases. Assuming the same level of effort at sea is maintained, the heavier and larger size of gas or battery/electric engines compared to diesel counterparts, may require either more kW or an increase in GT on the same vessel.

Contrary to shifting to using new fuel types, short-term solutions for lowering the fossil fuel consumption in fisheries do not involve more GT/kW in general (see Table 25). Minimising energy use with such solutions for more energy efficiency (see 6.3.1) before shifting over to alternative fuels will also help to minimize possible need for increased storage space for fuel.

**Table 25 – Changes in vessel dimensions for different decarbonisation modifications (see Annex 11)**

| Technology | Time horizon | Type of study    | Type of vessel                         | Changes in dimensions                                                                                                                                                                                                                                  | Reference                          |
|------------|--------------|------------------|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| LNG        | Long term    | Operative vessel | Seiner – Trawler (85 m)                | Dual engine + battery pack. 85 m length. 20 m longer than its previous siblings                                                                                                                                                                        | Baird-Maritime, (2021), EC (2023c) |
|            | Long term    | Viability study  | Coastal demersal trawler (33.18 m)     | 24.67 m <sup>3</sup> for an insulated LNG tank, while for Marine Gas Oil (MGO) the tank was 8.72 m <sup>3</sup> . Tank volume x 2.8.                                                                                                                   | Jafarzadeh et al. (2017)           |
|            | Long term    | Viability study  | Factory trawler (39.79 m)              | From MGO to LNG, modification in vessel dimensions:<br>Length w.l. (m): 39.79 to 41.06; Breadth (m): 10.5 to 12.03<br>Fuel tank volume specified (m <sup>3</sup> ): 38.5 à 70.0                                                                        | Leira (2018)                       |
|            | Long term    | Viability study  | 16.7 m trawler                         | Increment in dimensions:<br>Tank to (+122% volume); Length + 4.5 m (26.6%); GT + 39 GT (36.7 %)                                                                                                                                                        | FIS (2023)                         |
|            | Long term    | Viability study  | 24.5 m trawler                         | Increment in dimensions:<br>Tank to (+114.3% volume); Length + 7.5 m (30.6%); GT + 91 GT (36.8 %)                                                                                                                                                      | FIS (2023)                         |
| Methanol   | Long term    | State of the art | -                                      | Lower energy capacity, requiring about two times the tanks needed for MGO. (i.e. Vmethanol/Vdiesel=2)                                                                                                                                                  | Center (2017)                      |
|            | Long term    | State of the art | -                                      | Methanol requires twice the volume needed for a diesel tank, with the same energy content.                                                                                                                                                             | Gabriell and Jafarzadeh (2020)     |
|            | Long term    | Viability study  | Container ship (369 m)                 | For a service speed of 18 knots, tanks of 14,343 m <sup>3</sup> methanol and 994.3 m <sup>3</sup> diesel (dual fuel) would be needed, and approximately 7,500 m <sup>3</sup> would be needed (twice the tank volume with a methanol dual fuel engine). | Ammar (2019)                       |
|            | Long term    | Viability study  | 10 m pot fishing methanol using vessel | Increment in dimensions:<br>Tank to +1200 L (100%); Beam à + 0.7 m (20%)<br>GT to + 7 GT (53.8 %).                                                                                                                                                     | FIS (2023)                         |
|            | Long term    | Viability study  | 16.7 m trawler using methanol          | Increment in dimensions:                                                                                                                                                                                                                               | FIS (2023)                         |

| Technology                                    | Time horizon | Type of study                                | Type of vessel                                     | Changes in dimensions                                                                                                                                                                          | Reference                      |
|-----------------------------------------------|--------------|----------------------------------------------|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
|                                               |              |                                              |                                                    | Tank to + 9000 L (100 %); Length to + 3.25 m (19.5 %)<br>GT to + 29 GT (27.4 %)                                                                                                                |                                |
|                                               | Long term    | Viability study                              | 24.5 m trawler using methanol                      | Increment in dimensions:<br>Tank to + 23,150 L (110 %); Length to + 4 m (16.3 %)<br>GT to + 48 GT (19.4 %)                                                                                     | FIS (2023)                     |
| Biodiesel                                     | Short term   | Operative vessel                             | Artisanal fishing boats                            | Used B50 biodiesel extracted from waste cook oil, without any additional gear or modification.                                                                                                 | Moecke et al., (2016)          |
|                                               | Long term    | Review of literature                         | -                                                  | Brake specific fuel consumption is generally higher when compared to pure diesel. (Increased fuel consumptions may lead to higher storage requirements).                                       | Sakthivel et al., (2018)       |
|                                               | Short term   | Operative vessel                             | Trawlers (16 m and 19 m)                           | The vessels ran with B20, B60 and B100 biodiesel with no extra investment. Only initial fuel filter changes. Biodiesel blends should be stored and handled in the same way as ordinary diesel. | Ocean-Fisheries, (2010)        |
| Electrification – Hybrid and electric systems | Short term   | Operative vessel                             | 11 m and 12 m Small-Scale fishing vessels          | Diesel engine for steaming and battery power in the fishing grounds, all fitted in a 11 m vessel.                                                                                              | Maritime-Cleantech, (2019)     |
|                                               | Long term    | Viability study                              | 10 m pot full electric fishing vessel              | The vessel operation lasts 4 h. 315 kWh batteries and 100 kW electric motor could be installed without modifying gross tonnage (Figure 20).                                                    | FIS (2023)                     |
|                                               | Long term    | Review of literature                         | -                                                  | Battery banks are heavy, and they offer much shorter operational distances than diesel tanks with the same sizes.                                                                              | Gabrieli and Jafarzadeh (2020) |
|                                               | Long term    | Review of literature                         | -                                                  | Due to onboard space limitations, vessel autonomy is compromised.                                                                                                                              | Basurko et al. (2023)          |
|                                               | Long term    | Operative batteries                          | -                                                  | Gives a reference of a battery bank model, which has a volumetric energy density of 144 kWh/m <sup>3</sup> . In other words, it needs 1 m <sup>3</sup> to storage 144 kWh.                     | Kemp et al. (2021)             |
|                                               | Short term   | Energy Storage Systems and diesel generators | Some small-scale fishing vessels already operating | Change in vessel dimensions depends on the volumetric energy density of the batteries, and the size of the generator and electric motor                                                        | e.g., Corvus-Energy (2024)     |

| Technology             | Time horizon | Type of study            | Type of vessel                                                | Changes in dimensions                                                                                                                                                                                                                                                           | Reference                                               |
|------------------------|--------------|--------------------------|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
|                        |              |                          | with hybrid propulsion.                                       |                                                                                                                                                                                                                                                                                 |                                                         |
| Hydrogen, ammonia      | Long term    | Review of literature     | -                                                             | Liquid hydrogen requires 8 times more storage volume than HFO and 30 times more for compressed hydrogen. Hydrogen could also be stored as liquid ammonia, which does not require such low temperatures.                                                                         | Balcombe et al. (2019)                                  |
|                        | Long term    | Review of literature     | -                                                             | Due to hydrogen having a lower volumetric energy density so storage systems are required to be larger and therefore distribution can be difficult compared to 'traditional' fuels.                                                                                              | Romano and Yang (2021)                                  |
|                        | Long term    | Operative vessel         | Training fishing vessel (35 m)                                | Green Hydrogen fuel cell and batteries combined for zero emission operation. Trials supposed to have started in summer 2024. The fuel cell provides 340 kW, with the following dimensions: 2.3 x 1.4 x 2.2 m.                                                                   | e.g., Norwegian-Hydrogen (2024)<br>Corvus-Energy (2024) |
| Bulbous bow            | Long term    | Viability study          | 25.8 m trawler                                                | A bulbous bow with the length of $L_b = 0.6 * L_{WL}$ could reduce the water resistance for speeds above 8.5 knots. Cases were analysed from 2% to 10% of the waterline length of the vessel, ranging from 0.5 m to 2.3 m length of bulbous bow. EMFAF allows for such a change | Szelangiewicz et al. (2021)                             |
| Fish hold dimension    | Long term    | Literature               | Ability to catch increased with bigger catch from fewer trips | Larger vessel dimensions required. Improving Fuel Use Intensity by reducing the number of trips whenever fish hold capacity is limiting trip duration                                                                                                                           | ASD Ship Design study (2018)                            |
| Wind propulsion        | Long term    | Operative vessel         | 41 m longliner                                                | Rigid sail system installed onboard. 2.85 width and 12 m high. No increment in vessel volume needed. Visibility and stability concerns should be considered depending on the type of vessel. Suitable in fishing vessel with long routes.                                       | Aleixendri (2021)                                       |
| Fishing gear solutions | Short term   | Test in operative vessel | 75.5 m trawler                                                | No major changes needed in vessel dimensions. 17.7% fuel consumption reduction by using pelagic trawl doors.                                                                                                                                                                    | Grimaldo et al. (2015)                                  |
|                        | Short term   | Laboratory test          | -                                                             | 17% fuel consumption reduction with new trawl gear designs.                                                                                                                                                                                                                     | Lee et al. (2018)                                       |



| Technology                               | Time horizon      | Type of study                                             | Type of vessel                                    | Changes in dimensions                                                                                                                                                                                           | Reference                 |
|------------------------------------------|-------------------|-----------------------------------------------------------|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
|                                          | Short term        | Laboratory test                                           | Two 24 m trawlers                                 | No major changes needed in vessel dimensions. Up to 18% fuel consumption reductions by changing the net design parameters (e.g. mesh size).                                                                     | Parente et al. (2008)     |
|                                          | Short/medium term | Literature                                                | -                                                 | Change needed in vessel dimensions. Increase catch efficiency (larger nets per unit of effort), with risk for overexploitation compensated by increased mesh size. Compatible with EU Tech. Measures Regulation | Bastardie et al. (2022)   |
| Operational changes/<br>fishing strategy | Short term        | Viability Study. Monitoring and slow steaming.            | -                                                 | No major changes needed in vessel dimensions. 15% reduction in fuel consumption.                                                                                                                                | Latorre (2001)            |
|                                          | Short term        | Viability Study. Monitoring and slow steaming.            | 37 m purse seine and pole and line fishing vessel | No major changes needed in vessel dimensions. 15% reduction in annual fuel consumption.                                                                                                                         | Basurko et al. (2013)     |
|                                          | Short term        | Viability Study. Monitoring and slow steaming.            | Trawlers (27 and 28 m).                           | No major changes needed in vessel dimensions. 10-15% fuel consumption reduction after reducing steaming speed from 11 to 10.5 knots.                                                                            | Sala et al. (2011)        |
|                                          | Short term        | Viability Study. Route optimisation.                      | Tropical tuna purse seiners                       | No changes needed in vessel dimensions. Fuel reductions given by optimum routes searching for FAD objects.                                                                                                      | Granado et al. (2024)     |
|                                          | Short term        | Technical study. Route optimisation                       | Purse seiners                                     | No changes needed in vessel dimensions needed. routing optimisation can lead to fuel savings up to 20%.                                                                                                         | Marine Instruments (2022) |
|                                          | Short term        | Viability Study. Determining optimum fishing grounds.     | Tropical tuna purse seiners.                      | No major changes needed in vessel dimensions. Fuel consumption reduction given by determination of optimum fishing grounds.                                                                                     | Goikoetxea et al., (2024) |
|                                          | Short term        | Viability Study.                                          | -                                                 | No major changes needed in vessel dimensions. Fuel consumption reduction given by the consideration of sea currents for trip planning.                                                                          | Chang et al. (2016)       |
| Technological changes                    | Short term        | Operative vessels. Magnetic devices.                      | One trawler and one trolling line using vessels   | No major changes needed in vessel dimensions. Around 2% fuel consumption reduction was given by the usage of magnetic devices for fuel treatment.                                                               | Gabiña et al. (2016)      |
|                                          | Short term        | Viability study. Low consumption instrumentation onboard. | 39 m bottom-otter trawler                         | No major changes needed in vessel dimensions. Replacement of existing fluorescent lights by LEDs.                                                                                                               | Basurko et al. (2013)     |

| Technology         | Time horizon | Type of study                               | Type of vessel                                                   | Changes in dimensions                                                                                                                                                 | Reference               |
|--------------------|--------------|---------------------------------------------|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
|                    | Short term   | Antifouling coating                         | 21 m bottom trawler                                              | No major changes needed in vessel dimensions. Decreased fuel consumption after applying an innovative foul-release coating.                                           | Notti et al. (2019)     |
|                    | Long term    | Reduce engine size                          | In case of over-motorisation, reduce motor size to reduce speed. | Replace engine for smaller kW engines. No GT increase required. One vessel kW split into several vessels vs. two old vessels replaced by a new more efficient vessel. | CFP Art 22, 23          |
| Governance changes | Short term   | Rebuilding fish stocks to $F_{MSY}$ or less | All vessel types                                                 | Less time at sea if more abundant and healthy stocks. No change in capacity is needed                                                                                 | Bastardie et al, (2022) |

### 6.3.3 Capacity reallocation among fleet segments

To reduce fuel consumption, there is potential to change from fuel-intense to low-carbon fishing techniques. This should consider the flexibility in redistributing GT or kW across fisheries, with a focus on maintaining or reducing overall harvesting capacity, particularly for overfished stocks. This approach could also be used by Member States as a workaround to maximise the use of their allocated GT and kW without increasing overall fleet capacity.

However, reallocating effort from overcapacity or less efficient fleets to those with remaining margin and lower carbon intensity, may inadvertently create new imbalances. Hence, by analysing historical catch data and standardising capacity metrics to make them comparable across fisheries (see Section 3.3.1), a transition or conversion matrix based on in kW or GT could be developed (see example in Annex 10). This matrix could serve as the bases for testing prospective fleet conversion scenarios or supporting the development of specific fisheries. These scenarios would take into account fleet renewal requirements, such as increased safety, better working conditions/habitability, and modernisation for energy transition, and could be used to evaluate the subsequent change in overall EU fishing capacity under a given level of kW or GT.

By nature, fish stocks are subject to inherent variations, which cause fishing opportunities to vary over time. This variability can conflict with a fixed fishing capacity, potentially leading to short-term imbalance, either under- or overcapacity. Such imbalances are likely to persist in specialised fleets that may struggle to adapt when fishing opportunities for their specific target species decline. In contrast, allocating more capacity to polyvalent vessels (those fishing upon a diverse portfolio of species), may help mitigate this risk (see Section 7).

In fisheries experiencing excess effort or overcapacity, the implementation of individual vessel quotas was predicted to reduce fleet imbalance. Such quotas would enable an increase in the fishing capacity of more economically viable fishing vessels, while likely reducing the overall capacity as it is reallocated from vessels exiting the sector. The implementation of individual vessel quotas, has for example led to a reduction in the number of fishing vessels in countries such as Norway or Denmark (Asche et al., 2014).

There are examples of managing harvesting capacity that take into account differences in fishing techniques (see Table 26). Harvesting capacity translates into fishing mortality when fishing capacity is multiplied by the fishing pressure (effort) on fish stocks. Hence, the fishing mortality resulting from a given level of fishing effort depends on the specific fishing techniques used. However, if some fishing vessels can be specialised in a particular technique, it is also possible to operate different techniques on polyvalent vessels. This makes the relationship

between a vessel's harvesting capacity and a specific fishing technique less straightforward.

**Table 26 – Fishing gear characteristics that would define harvesting capacity and possible limiting factors**

| Fishing Technique        | Harvesting Capacity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Longliners               | Average number of hooks used in longlines, average time per 24 h that lines have been in the sea with a number of shots and fishing depths. If the distance per hook is constant, the total distance of the line could be measured. Number of lines carried onboard is limited by storage space, the larger number of crew and deck space needed for operating the fishing.                                                                                                                                                                                                                 |
| Vessels using fixed nets | The mesh size, average length and average height of the nets, time in the sea with number of hauls, and fishing depths. Vessel GT is more likely to determine the harvesting capacity since the size of the vessel will determine the amount of gear and size of crew on board.                                                                                                                                                                                                                                                                                                             |
| Trawlers                 | The mesh size and mesh geometry of the net, the time that the nets have been in the sea with a number of hauls, fishing depths and the surface opening of the net, the behaviour and speed of the fish targeted, etc. all aspects that depend on or define an optimal trawl speed, which ultimately depend on vessel speed capabilities and vessel length, GT used for storage, and on the propulsion system including a particular engine power kW, propellers etc, and auxiliary power to pull the trawl back. The beam length would also be representative in the case of beam trawlers. |
| Pair trawlers            | Fishing in pairs can enable small vessels to combine their fishing power and tow much bigger trawl sizes than would be expected from individual vessels, gaining more than the sum, also avoiding scaring away fish schools when vessels are departed from the gear path.                                                                                                                                                                                                                                                                                                                   |
| Seiners                  | Total net length deployed and depth of the net, limited by the storage capacity onboard and the strength of the power-block. Attention should be paid to number of fish-aggregating devices (FAD)                                                                                                                                                                                                                                                                                                                                                                                           |
| Pots                     | Number and size of the pots limited by storage capacity onboard to store the pots and water tank for conserving the catch alive if needed. However, more pots than what is possibly feasible to carry can be operated whenever fishing would occur close to the shore. No complicated infrastructures needed onboard to operate pots.                                                                                                                                                                                                                                                       |

What is at stake when reallocating effort among fleet segments is the need to document the equivalence of fishing effort between different techniques (e.g. trawlers, longliners), for instance through the relative volume or catch composition per unit of GT or effort. The passive fishing gears, for example, are left on the fishing grounds while the vessel either sets other gears or returns to port, the measurement of fishing time or activity may become independent of the vessel's actual time spent at sea. An example of translation of fishing effort is provided within the West Med Plan, which outlines methods to convert nominal effort reductions into effective effort reductions per type of fishery when implementing the plan's required effort reductions. Conversion factors should also account for differential effects on the environment so that to account for it when encouraging Member State to take action for converting or reallocating capacity toward those fishing practices with lower impacts on the environment.

### 6.3.4 The case of the EU fleet of the Mediterranean Sea

The fishing sector in the Mediterranean faces several challenges that hinder the transition to lower-carbon operations, which are often different from the challenges in other parts of the EU fishing fleet (e.g. a semi-closed sea with a specific biodiversity, smaller vessels, and numerous landing sites). The Mediterranean fishing industry typically operates with tight profit margins, while the upfront costs of decarbonisation technologies such as energy-efficient engines, alternative fuels, or renewable energy systems, are significant. As a result, the energy transition process was initiated in a top-down approach.

In March 2023, the General Fisheries Commission for the Mediterranean (GFCM) held its first workshop on decarbonising the fishing industry (GFCM WKDECA 2023) <sup>(70)</sup>. The workshop identified short-, medium-, and long-term actions and solutions for decarbonisation. Short-term solutions included improving data collection on fuel consumption, launching pilot projects to test new fishing gear, and conducting socio-economic analyses to evaluate the impact of decarbonisation on the sector. Medium-term solutions involved creating a regional platform for the exchange of best practices and mapping fuel consumption baselines. For the long-term, the workshop explored structural modifications to vessels and the use of alternative fuels.

Sala et al. (2022) recognised the potential of improving the decarbonisation of fisheries through the adoption of easy-to-implement changes, such as the use of alternative gear materials, lightweight trawl doors, and modifications in fishing behaviour (e.g. vessel speed reduction), all of which can be adapted to different fisheries and vessel types. Various projects are getting started under the initiative of the European Commission (mission Ocean projects) <sup>(71)</sup> to further investigate these aspects. In 2023, the EC launched a specific project entitled “DecarbonyT – Decarbonisation of the fishing fleet in the Mediterranean and Black Sea” <sup>(72)</sup>. The overarching aim of DecarbonyT is to assess to what extent the use of optimized trawling gears in the Mediterranean and Black Sea can lead to lower fuel consumption and a more decarbonised fishing fleet. Preliminary results of the first DecarbonyT experimental survey show promising opportunities for reducing fuel consumption for trawlers, especially when a combined gear configuration (floating doors and redesigned trawl) has been tested. Commercial catches were mostly constant in all hauls, and significant fuel savings were observed, even if there were specificities by subregion of at-sea trials in the West Med, in the Adriatic, and East Med. Longer term decarbonisation solutions are considered in the framework of SEAGLOW project <sup>(73)</sup>, which aims to test hybrid propulsion systems and alternative fuels such as hydrotreated vegetable oil (HVO) in small-scale fishing vessels.

---

<sup>(70)</sup> <https://www.fao.org/gfcm/technical-meetings/detail/en/c/1639499/>

<sup>(71)</sup> For example, see Digital technologies and energy transition in fisheries and/or aquaculture HORIZON-MISS-2025-03-OCEAN-03

<sup>(72)</sup> <https://decarbonyt.eu/>

<sup>(73)</sup> <https://seaglow.eu/>

## 7 Fishing capacity management

The focus of this section is on examining impacts of fishing capacity management approaches, also depending on the management regime in place, i.e. Total Allowable Catches (TACs), and quotas or effort management systems. This discusses the impacts of the policy on the EU fleet including limitations and barriers to its modernisation or renewal, and the extent and possible causes of the currently unused capacity.

### 7.1 Impacts of fishing capacity management in EU (including limitations and barriers to its modernisation or renewal)

Examining the impacts of fleet policy on the EU fleet involves identifying both the limitations that constrain progress and the barriers that must be overcome for modernisation or renewal. It also requires assessing whether these constraints help explain the currently low levels of investment in new vessels.

Meeting the future needs of the fishing sector while maintaining a balance between fishing opportunities and fishing capacity remains a significant challenge. Under the current policy framework, this may result in an overall reduction in the number of vessels, with the aim of removing those that are out of balance. At the same time, the current regulations include instruments that can help address specific requirements for vessel modernisation, facilitating the energy transition, improving working conditions, and reducing negative externalities (e.g. by adopting alternative fishing gears to reduce impacts on marine habitats).

However, within the framework of the CFP and associated legislation, certain barriers to the development of fishing capacity have been deliberately established (e.g. the ban of subsidies for new vessels, see Section 2). While these were designed to control overcapacity, they may now hinder the sector's ability to retrofit vessels, modernise engines, renew the fleet and adopt the latest innovations. Indeed, regulatory barriers can delay or prevent the authorisation of innovative solutions, such as using greener fuels that conflict with the urgent need to renew and modernise an ageing fleet.

New technologies continue to improve under all conditions (e.g. by increasing vessel efficiency). The effectiveness of fleet policies in preventing fleet imbalances will likely depend on the type of fisheries management system in place, such as whether management is based on effort control or catch limits. Under an effort management regime, improvements in efficiency may necessitate continuous reductions in effort levels. Hence, it is important to examine how increases in fishing capacity may affect fisheries depending on whether target

stocks are managed under strict catch limits or regulated primarily through effort controls (e.g. limits on fishing days or in the number of licensed vessels).

In this context, fishers may invest in better technology, including more efficient or larger fishing gear (e.g. increased gear length, width, or mouth opening), use the smallest legally permitted mesh size, or increase the volume dedicated to fish holds or fishing gear, all of which increase their overall ability to catch fish.

Increasing the ability to catch fish can lead to higher bycatch, rising operating costs, and economic imbalance due to overcapitalisation. Under an effort-based management regime, vessels are incentivised to increase their fishing efficiency to maximise their economic returns per unit of effort. This could lead to a 'race to fish', where investments in better technology result in an imbalance and contribute to overfishing without effective output controls such as TACs and quotas.

This section introduces key considerations regarding barriers to fleet renewal, showing how current regulations, such as capacity ceilings and the requirement to withdraw equivalent capacity when introducing new vessels, may constrain fleet modernisation. In this respect, the situations in the Northeast Atlantic and the Mediterranean and Black Sea regions differ markedly in terms of the outcomes of EU fleet policy, largely due to the dominant fisheries management regimes in place (i.e. output controls in the Northeast Atlantic versus input controls in the Mediterranean and Black Sea). Where relevant, distinctions have therefore been made between the specific challenges faced in each of these two regions.

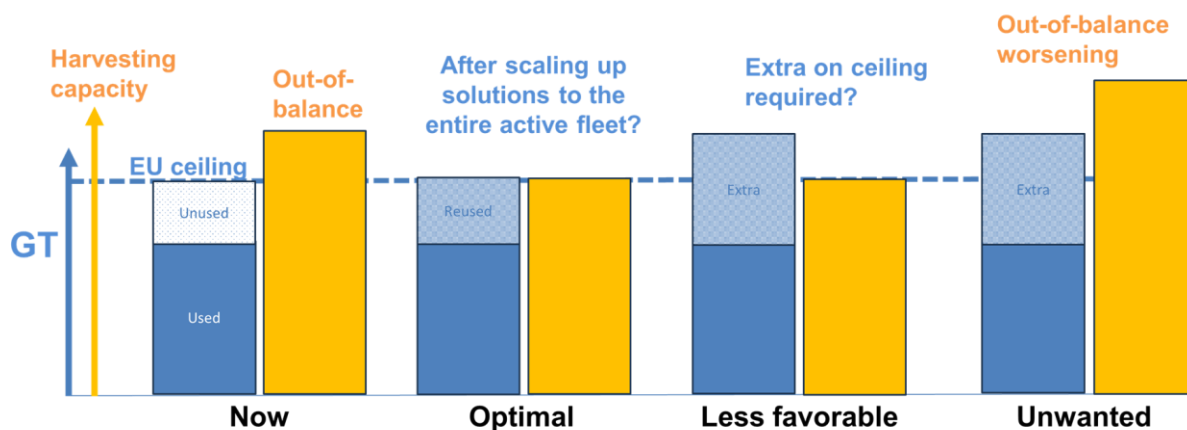
Ensuring the energy transition and improving safer working conditions pose special challenges considering the existing country-specific ceilings on GT (Table 27). For example, in its response to the Commissioner's letter of 15<sup>th</sup> January 2024, one Member State suggested that "a possible way forward could be a more flexible approach at the EU level, where [the GT] capacity rules only apply to the part of the vessel used for storing fish. This would create more opportunity for green solutions, such as batteries or hydrogen". However, since fish holds represent only a small proportion of the vessel's total GT, implementing such a proposal would undermine the effectiveness of existing capacity ceilings, which are currently based on overall vessel GT.

These national capacity ceilings and the entry/exit scheme may limit the ability of fleets to adapt, especially when some new builds would be powered with larger kW engine, or some of the innovative solutions require additional space and kW to maintain profitability. If vessel or engine modernisation, such as greener fuel than diesel, results in increased space and consequently greater harvesting capacity, it would prevent the balance between fleet capacity with available fishing opportunities (i.e. 'unwished' for scenario, see Figure 16).



**Figure 16 – Hypothetical scenarios to show alternative outcomes under both EU fishing capacity ceiling for GT (blue bars) and ability to catch fish (the “harvesting capacity”) with a harvesting cap to prevent overfishing on stocks (yellow bars).**

Note that if the harvesting capacity can silently exceed the cap, the fishing capacity cannot exceed the national capacity ceiling as for the CFP Art 22



Source: Own elaboration

The Figure 16 above shows various outcomes of hypothetical scenarios where the scaling of energy transition and modernisation requirements to the full active fleet may reveal incompatibilities with Member States' capacity ceilings. For example, the optimal outcome would enable the fishing capacity (GT) to increase up to reach a national ceiling level, while maintaining harvesting capacity in balance with fishing opportunities.

A second less favourable scenario may exist where future fishing capacity (shown in blue in Figure 16) exceeds the ceiling level but harvesting capacity (in orange) remains in balance with the fishing opportunities. This could result from an energy transition pathway that enables the construction of larger vessels without increasing their ability to catch fish. Fishing capacity ceilings for MS were originally set based on the capacity levels at that time (the “reference” period), and each vessel leaving the fleet with the help of public money has since reduced those ceilings. Exceeding these national thresholds might be acceptable, as long as the fleet's harvesting capacity remains unchanged (or reduced for imbalanced segments).

Finally, a completely unwanted scenario, would occur if both future fishing capacity exceeded national limits and harvesting capacity became out of balance with fishing opportunities. This is the most likely scenario if monetary compensation would be given to individual vessels to keep an oversized, imbalanced fleet in business, while simultaneously allowing extra fishing capacity to address modernisation needs.

These scenarios highlight the importance of assessing whether current ceilings can accommodate the necessary changes or whether they would be exceeded, leading to further situations of imbalance.

**Table 27 – Identified specific EU sea basins challenges in managing the EU fleet capacity and impacts of policy on the EU fleet**

| Challenge                | NEA                                                                                                                                                                                                                                                                                                                            | Med & Black Seas                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | All basins                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Safety/working condition | Old vessels.                                                                                                                                                                                                                                                                                                                   | Many small and old vessels, not fit to rough or extreme weather conditions.                                                                                                                                                                                                                                                                                                                                                                                                                          | Lack of attractive working conditions impairing generation renewal.<br><br>Energy transition solutions need safer operating conditions.                                                                                                                                                                                                                                                                                                                              |
| Energy transition        | Remote fishing grounds necessitating fishing vessels equipped with onboard fish hold storage to preserve the catch. Processing activities can be extensive, as larger vessels embark on week-long trips far offshore, including sorting, cleaning, and packaging the catch, all of which require room onboard vessels.         | For small-scale vessels, the transition to low-carbon technologies with hybrid or electric engines is still in development, and the necessary infrastructure to support electric charging or alternative fuel refueling (such as hydrogen or biofuels) is still not developed in most Mediterranean ports.<br><br>SSF is already a solution for energy transition because of less Fuel Use Intensity (FUI) than Large Scale Fleet.                                                                   | Larger space required on board to fit new, larger, heavier engines for alternative fuels (all with less energy per volume compared to marine diesel).<br><br>Lack of necessary incentive to enable the transition towards a low-carbon fishing sector induced by the fear, or lack of interest, or the incapacity to change how skippers operate their business, given the uncertainty and the upfront costs and payback time of the investment (GFCM WKDECA, 2023). |
| Fishing capacity         | Quota regime. Mixed fisheries. Cumulative impacts (with external-to-fishing factors) affecting ocean productivity and increasing the risk for imbalance with inflexible capacity.<br><br>Opportunities: Adoption of the “best available fishing techniques” may result in a transition toward vessels requiring less GT or kW. | Effort regime. Multi-gear multi-species fisheries. Numerous landing locations. Many imbalanced fleet segments.<br><br>Increasing economic performance by lowering fuel expenses might lead to a greater “ability to catch fish” if such expenses are the only limiting factor.<br><br>Lack of future prospects as the fishing opportunities are decreasing to reach MSY in the West Med Plan, while rebuilding stocks and profitability takes time.<br><br>Fluctuating fuel prices add to the issue. | Under question: the feasibility of increasing a vessel's GT and/or kW without increasing its ability to catch fish.<br><br>Limited Refit/Retrofitting and foregone revenue during the refit, upfront costs while limited investment possibilities.                                                                                                                                                                                                                   |

In the past, adjustments to the EU law have already been suggested to allow fleets to accommodate the additional storage volume needed by implementation of the landing obligation (LO) under Article 15 of the 2013 CFP Regulation. However, such a rationale may directly contradict the intended objectives of the LO. Therefore, justification for requesting additional vessel volume should be carefully checked for possible inconsistencies with the objectives of the CFP.

Before discussing individual aspects regarding fleet policy, we will provide results from a questionnaire on fleet policy issued by the EC at the beginning of 2023 in the next section. Those results show how Member States look at current barriers and developments regarding fleet policy.

## 7.2 Main results from a questionnaire to Member States

In January 2024, Commissioner Sinkevičius sent a letter to the Member States regarding their fishing fleets. The main purpose of the enclosed questionnaire was to gather background information on key aspects of fleet policy, including the age of fleets, unused capacity, and factors hindering investment. All 21 EU coastal Member States with access to coastal waters provided answers to the European Commission. These responses were made available for use in this fleet policy report.

Overall, 13 Member States reported that limits in capacity (GT and kW) hinders possibilities for energy transition, while only 4 argued that this is an important reason for problems to invest in an improvement of working conditions. Although there was only a small number of Member States mentioning this, many discussed the general problem of missing investments in the fishing sector due to problematic economic conditions.

From the 21 Member States, 16 reported having available unused capacity above 500 GT, while 14 reported unused capacity exceeding 100 kW. Some Member States, however, have a system of private ownership of capacity licences. In cases where vessels are withdrawn from the fleet without assistance of public funding, the owners receive a capacity licence, meaning that the capacity is not removed from the national capacity ceiling. This kind of 'sleeping' capacity could, for example, be used by other companies for future investments.

Many Member States consider the limited availability of kW to distribute to new fishers or to companies wanting to invest in energy-efficient or decarbonized engine technologies as a key obstacle to modernisation. However, governments cannot take decisions who may receive that capacity for investments.

Several Member States mentioned that the current rules governing public (state) aid is an issue regarding renewal of fleets. A specific issue in this respect is the ban on supporting the construction of new vessels. Many countries claim that this restriction is one reason why only a few companies have invested in new vessels. Fishing companies often lack funds to invest in new vessels and claim that only additional public funding would make such investments possible.

However, the question is whether the EU or national governments should allow public funding for new vessels, given that this was one of the main reasons for overcapacity, both in the past and present (e.g. some non-EU countries have heavily invested subsidised new vessel construction, Skerret et al. 2020). This

issue may stem from the fact that high subsidies in the past allowed fishers to invest in vessels larger than their available quota justified. Consequently, after 20 to 30 years, these operators cannot generate enough income to build up capital for vessel renewal (personal communication, fishermen's representative).

## 7.3 Unused fishing capacity

Unused fishing capacity refers to both the underutilisation of a vessel's capacity (e.g. the number of days at sea per year), and to latent or inactive capacity, where a vessel is not engaged in fishing activity but retains a fishing license and remains registered in the EU Fleet Register. In the STECF report (STECF, 2023), experts report on possible reasons for inactive vessels and unused fishing capacity (see Section 3).

### Unused capacity from inactive vessels

Many countries report fleet segments with only a few days at sea in their annual fleet reports. For small-scale fisheries, Member State reports often indicate that these vessels operate only part-time during the year, resulting in some degree of 'underutilised' fishing capacity.

Member States can voluntarily report both the maximum number of days at sea and the extent to which their vessels approach that level. Alternatively, the number of days at sea is compared to a benchmark of 220 days as a theoretical maximum number of days at sea.

Since there are always vessels that are temporarily inactive, due to repairs, refitting or pending sales, the STECF, following EC 2014 guidelines, assumes that operating at only 70% of days at sea may indicate technical inefficiencies. This could indicate an excess number of vessels in a fleet segment relative to the available fishing opportunities, suggesting that the segment could be out of balance (STECF, 2023).

The inactive vessel indicator identifies vessels that may potentially return to fishing. However, in the Northeast Atlantic, only a few segments show a high level of inactive vessels (Table 28). While the number of inactive vessels increased by 27.3% between 2013 and 2022, the amount of kW decreased by 4.7%.

In the small-scale fleet segments, it is not unusual that fishers are not fishing year-round and have also other sources of income. It is important to note that a vessel being inactive does not necessarily mean that it is entirely unused. In many cases, especially for small vessels, inactivity results from economic reasons, part-time operation by fishers, or a planned permanent cessation.

**Table 28 – Evolution of inactive vessels from 2013-2022**

| EU27                             | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|----------------------------------|------|------|------|------|------|------|------|------|------|------|
| No. vessels                      | 14.3 | 14.2 | 17.3 | 14.5 | 16.1 | 15.6 | 16.9 | 17.7 | 17.4 | 18.2 |
| Total vessel tonnage (GT)        | 649  | 648  | 712  | 631  | 698  | 661  | 661  | 734  | 724  | 786  |
| Total vessel power (kW)          | 124  | 114  | 116  | 106  | 97   | 99   | 93   | 101  | 103  | 119  |
| Value of physical capital        | 520  | 516  | 584  | 553  | 448  | 460  | 444  | 476  | 470  | 518  |
| Consumption of fixed capital     | 15   | 15   | 32   | 24   | 27   | 65   | 66   | 79   | 82   | 84   |
| Opportunity cost of capital 3.5% | 18   | 18   | 20   | 19   | 16   | 16   | 16   | 17   | 16   | 18   |

Source: STECF (2024c). Note: Member States data submissions under the 2024 Fleet Economic data call (MARE/A3/ACS(2024)); All monetary values adjusted for inflation; constant prices (2022). Number of vessels, tonnage and vessel power reported in thousands, value of physical capital, consumption of fixed capital and opportunity cost reported in millions.

The relevant indicator in the STECF balance report is the vessel utilisation ratio (VUR). The STECF reports the number of fleet segments classified as either in-balance or out-of-balance based on this ratio (see Section 3). In terms of both inactive vessels and the VUR, unused fleet capacity in the EU fleet operating in the Mediterranean Sea has been steadily decreasing.

### Unused fishing capacity from latent/inactive capacity

According to the entry/exit scheme defined in Article 23 of the 2013 CFP Regulation, some companies have scrapped vessels without receiving public aid and obtained documentation confirming that they retain ownership of that capacity “virtually”. This allows them to build a new vessel with private funds, drawing on this virtual capacity, either their own or capacity purchased from others. In practice, this means a new vessel could be as large as the scrapped one(s), within the limits of the virtual capacity held. In some Member States, operators receive a certificate about removed capacity (which stays in the register of the Member State as no public funds are issued to withdraw the capacity) when capacity is withdrawn, while in others, no certificate is returned, and the capacity is returned to the public (as indicated in the Member State answers to the questionnaires).

This raises the question of whether, in countries where private and/or public ownership of capacity is allowed, the available GT or kW is sufficient to support fleet modernisation. This issue is particularly relevant when implementing solutions that would require additional capacity on individual vessels to maintain profitability.

Examples from practices from some Member States are provided below. As stipulated in Article 22 of the 2013 CFP Regulation, capacity from the Spanish vessels permanently removed from the fleet register cannot be used to offset new capacity. However, Spanish Royal Decree 1044/2022 (see Annex 7 for further details), allows the government to reallocate available GT and kW to other fishing companies, regardless of the fleet segment from which the previous vessel was

removed provided that the withdrawn vessels were not decommissioned with public aid.

By contrast, other Member States have imposed stricter limits on capacity redistribution. For example, Germany has aligned its fleet segmentation with the DCF segments as required by the DCF, assigning vessels into those segments. If a company wants to invest in a new vessel, it must ensure that the capacity stays within the same segment's overall limits. Hence, the German fishing management system is more precautionary compared to the Spanish system, which is more flexible. However, the Spanish approach places greater responsibility on fisheries managers to effectively reallocate fishing capacity to minimize the risk of imbalanced fleets. If a particular fleet segment is already imbalanced and more fishing capacity is added, it will become increasingly difficult for that segment to achieve balance.

In addition, permanent cessation measures, whether through vessel scrapping or decommissioning, can further reduce the number of active vessels in a short timeframe (see also Figure 1). In Italy, a new decommissioning scheme was launched in July 2024, targeting a planned reduction of about 11 200 GT, equivalent to 9% of the country's active GT in 2023. The decommissioning scheme starts in 2025 and will be reflected in the fleet register at earliest in 2026.

### **The reasons behind underutilisation**

One of the main drivers for the 2013 reform of the CFP reform, outlined in the Green Paper (COM (2009)163 final), was the high number of overfished stocks in European waters. The introduction of MSY as a management objective, along with the implementation of long-term management plans (before 2013) and multiannual plans (after 2013) <sup>(74)</sup> led to improvements in the status of many stocks in the NEA (Table 29).

---

<sup>(74)</sup> [https://oceans-and-fisheries.ec.europa.eu/fisheries/rules/multiannual-plans\\_en](https://oceans-and-fisheries.ec.europa.eu/fisheries/rules/multiannual-plans_en)



**Table 29 – Number of overfished stocks in EU waters in the NEA**

| EcoRegion         | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|-------------------|------|------|------|------|------|------|------|------|------|------|
| ALL               | 53   | 57   | 54   | 57   | 55   | 53   | 47   | 39   | 36   | 39   |
| Baltic Sea        | 7    | 7    | 6    | 7    | 6    | 6    | 5    | 5    | 3    | 2    |
| BoBiscay & Iberia | 12   | 12   | 12   | 12   | 11   | 11   | 9    | 7    | 7    | 6    |
| Celtic Seas       | 12   | 13   | 12   | 13   | 15   | 14   | 12   | 9    | 10   | 14   |
| Greater North Sea | 15   | 18   | 19   | 20   | 19   | 17   | 18   | 17   | 15   | 16   |
| Widely            | 7    | 7    | 5    | 5    | 4    | 5    | 3    | 1    | 1    | 1    |

| EcoRegion         | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|-------------------|------|------|------|------|------|------|------|------|------|------|
| ALL               | 35   | 39   | 35   | 34   | 32   | 30   | 32   | 27   | 25   | 25   |
| Baltic Sea        | 3    | 4    | 5    | 4    | 3    | 4    | 3    | 3    | 3    | 1    |
| BoBiscay & Iberia | 7    | 7    | 5    | 5    | 4    | 4    | 4    | 2    | 0    | 0    |
| Celtic Seas       | 9    | 9    | 8    | 10   | 8    | 7    | 7    | 5    | 8    | 9    |
| Greater North Sea | 15   | 17   | 15   | 13   | 15   | 13   | 16   | 15   | 11   | 12   |
| Widely            | 1    | 2    | 2    | 2    | 2    | 2    | 2    | 2    | 3    | 3    |

Source: STECF (2024b).

These management plans reduced the level of annual bargaining between Member States over fish quotas. In most cases, the AGRIFISH Council of Ministers adopted quota proposals that followed the rules laid out in the plans, particularly Harvest Control Rules (HCR). In addition, the reduction of fleet overcapacity contributed to the recovery of fish stocks. As a result, the status of many stocks has improved over the last decade (STECF, 2024b p. 30) (Table 30).

**Table 30 – Number of stocks by year for which fishing mortality (F) was above/below  $F_{MSY}$  in the Mediterranean and Black Sea**

| Status           | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------|------|------|------|------|------|------|------|------|------|------|
| $F > F_{MSY}$    | 33   | 37   | 43   | 45   | 47   | 44   | 51   | 50   | 50   | 48   |
| $F \leq F_{MSY}$ | 11   | 10   | 11   | 11   | 10   | 15   | 12   | 13   | 13   | 15   |
|                  | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
| $F > F_{MSY}$    | 47   | 47   | 52   | 48   | 49   | 49   | 48   | 42   | 39   | -    |
| $F \leq F_{MSY}$ | 16   | 16   | 12   | 16   | 15   | 15   | 16   | 22   | 25   | -    |

Source: STECF (2024b)

On the other hand, there are cases where certain fish stocks remain underutilised because the EU quota is not fully fished. A prominent example in EU waters of the NEA is the plaice stock in the North Sea. Plaice is caught as part of a mixed flatfish fishery, where common sole is the main target species. In this context, the sole quota acts as the limiting factor, effectively capping plaice catches. There is no targeted plaice fishery, primarily due to its low market value and high costs associated with direct fishing efforts specifically towards plaice.

In recent years, many Dutch beam trawlers, traditionally catching sole and plaice, have been scrapped. The main reason was the ban on pulse trawling and increasing fuel costs, which made it unviable for vessels to stay in business given



it is by nature a fuel-intense fishery. Germany has only four flatfish vessels remaining, which may also leave the fishery soon. As a result, the remaining trawl fleet will be relatively small and lacks sufficient capacity to exploit the available quotas (ICES, 2025).

There are also other species for which the ICES-estimated catches (landings plus discards) do not reach the agreed TAC. The reasons for not reaching the quota are different from those in the flatfish fishery. Some stocks may be overestimated (i.e. stock biomass lower than in the official assessment). In other cases, the Council of Ministers may set quotas higher than the ICES catch advice and fishers were not able to fish out the quota. For stocks with a low biomass, the species may act as a 'choke species' limiting fishing effort for a vessel once its quota is fished out. Low market prices for many species can also make it difficult to fish out a quota. In addition, climate change is already affecting the distribution of stocks in the NEA. As the distribution of quotas do not change, vessels in some cases need to travel over longer distances to catch their quota compared to previous decades, as stocks have moved further north.

In her letter to Commissioner Kadis <sup>(75)</sup>, the President of the European Commission, Ursula von der Leyen, stressed that fisheries and aquaculture need to be part of the Commission's work on food sovereignty. Although it is clear that the EU is unable to produce as much fish as is currently consumed <sup>(76)</sup>, better utilisation of its own resources could still be important. Stocks for which quotas are not fished out could be of particular concern, especially in cases where the same or similar species are imported. Examples from 2024 for the North Sea are (see latest ICES advice for 2025):

- Haddock (Subarea 4, Division 6a): TAC 101 421 t, ICES catches 53 702 t.
- Hake (Northern stock): TAC 72 839, ICES catches 53 733 t.
- Plaice (Subarea 4, Subdivision 20): TAC 18 2500 t, ICES catches 73820 t.
- Saithe <sup>(77)</sup> (Subareas 4 and 6, Division 3a): TAC 66 876 t, ICES catches 58 305 t.
- Sole (Subarea 4) for 2023: TAC 9 152 t, ICES catches 4 375 t.
- Whiting (Subarea 4, Division 7d): TAC 76 697 t, ICES catches 30 413 t.

---

<sup>(75)</sup> [https://commission.europa.eu/about/organisation/college-commissioners/costas-kadis\\_en#documents](https://commission.europa.eu/about/organisation/college-commissioners/costas-kadis_en#documents)

<sup>(76)</sup> In 2022, total EU consumption of wild capture fish (7,443,680 t) was reported to exceed EU wild capture production (2,838,459 t):  
[https://eumofa.eu/documents/20124/145239/EFM2024\\_EN.pdf](https://eumofa.eu/documents/20124/145239/EFM2024_EN.pdf)

<sup>(77)</sup> The saithe stocks seem to be suffering specifically from climate change (stock moves North) and the advice for 2026 shows a decline which led to a revoke of the MSC certification for parts of the fleets. The underutilisation of the quota is a sign that the reason for a decreasing stock is most likely not overfishing.

These differences between the TAC and the overall catches can vary considerably between the years. Fishers plan their activities based on economic considerations. However, current data suggest that, for the North Sea, the discrepancies between TACs and actual catches seem to be increasing. For the flatfish fleet, this is a clear sign of high production costs, whereas for other species the reasons are not that obvious. In all these cases, it could be an issue that individual vessels cannot simply react by changing their target species, fishing grounds or fishing techniques, as they hold quota for certain species (Döring, 2023).

There are, however, also examples for an overshoot of the TAC in some fisheries for 2024:

- Herring (Autumn spawners subarea 4, Divisions 3a and 7d): TAC 510 323 t, ICES catches 520 609 t.
- Anglerfish (Subarea 4 and 6, Division 3a): TAC 11 293 t, ICES catches 15 732 t.

Inflexibility in reallocating GT or kW between operators, as permitted under national legislation, can also act as a barrier. Fishers seeking to improve fuel efficiency, adopt carbon-free technologies or enhance working conditions, may be unable to access the necessary capacity or reactivate it alongside stock recovery. Although capacity may be available in some countries, in many others it is not (see Section 6.2). Member State-specific rules may further limit flexibility. This can leave some vessels too specialised and trapped in unsustainable practices.

The development of modular, polyvalent vessels capable of adapting to different fisheries, could offer a way forward. In addition, maintaining a diversified portfolio of quotas and deploying low-impact, low-carbon fishing techniques may help address some of the underlying structural imbalances, creating potential win-win outcomes for the environment and the industry.

## 7.4 Proposed measures to address and reallocate capacity effectively

Reviewing the literature and findings of the present study, we have identified the following measures that may improve the use of inactive vessels and unused fishing capacity (i.e. virtual capacity from vessels scrapped without public funds):

### 7.4.1 Overcoming barriers to operating innovations

Solutions that would rearrange a vessel's GT or advise on optimal kW would be assessed on a case-by-case basis through a technical audit. Such assessments would involve consultations with naval architects, marine engineers, or other

independent entities, and would be further reviewed by independent technical experts in the field.

There is a continued need for providing demonstrators, pilot studies, and “concept vessels” to serve as proofs of concept (see, for example, the EC report “Possibilities and examples for energy transition of fishing and aquaculture sectors”) (European Commission, 2023c). These initiatives would help showcase the technological readiness of different solutions and their compatibility with current practices. Feasibility often depends on the type of fishing techniques and practices (e.g. autonomy constraints limiting range, or the minimal power needed to tow nets), as well as the characteristics of the ecoregion. Different fisheries present distinct challenges.

Economies of scale may be achieved by developing a value chain through the standardisation of vessel construction and infrastructure. Fleet renewal could start with smaller fishing vessels, using designs that would prioritise polyvalent, modularity, and standardisation to enable future retrofitting. This should be done while addressing the specific needs of different fleet segment and ecoregions.

Overcoming economic barriers includes facing upfront costs for retrofitting and modernisation. Access to external capital is crucial, and the payback period of the investment must not exceed the operational lifetime of the vessel. Public funding could help by lowering loan costs or covering part of the total investment, making innovative technologies more attractive. Targeted financial aid and support, especially to small-scale fisheries, could be made to facilitate access to funding, banking services and insurance (see Annex 12).

Operating a renewed, innovative fleet requires parallel efforts in developing new education programmes for engineers and seafarers, including fishers, to enhance their skills and abilities and authorise them to operate the innovations and ensure the standardisation of processes. One possible solution is for the EU cohesion policy (European Commission, 2025a) to support education schemes for fishers, engineers and other operators. Another is to invest further in R&D to more rapidly reduce the safety risks associated with alternative fuels.

In the longer term, when the use of alternative fuels is the objective, fleet renewal also requires the development of new port facilities, such as fuel storage facilities, and energy transport systems to deliver fuel from production sites to ports. Further to this, ensuring adequate fuel supply to meet demand is essential. Solutions will vary depending on the level of technological readiness, including the use of alternative fuels such as methanol or ammonia, for which infrastructure is already being developed for the needs of the commercial shipping sector, creating potential synergies.

A useful approach is to identify lessons learnt from successful transitions, including those from the EU Mission Ocean projects, the EU Pilot Project

funds<sup>(78)</sup>, and various other Member State-level initiatives. These examples often demonstrate win-win solutions. For example, fitting a bulbous bow can significantly reduce total resistance and required engine power (less kW needed for water displacement) while also enhancing safety and vessel performance by increasing speed, reducing fuel consumption, and improving both stability and seakeeping.

However, prioritisation and sequencing (i.e. developing a clear roadmap) are essential, as not all solutions are achievable in a short time frame (see European Commission, 2024d). Specifically, the lack of infrastructure in the EU's Outermost Regions can further constrain the options of distant-water fleets, especially when landing in non-EU ports (see the Portuguese case study, Section 4.4). In practice, scheduling new vessel construction or refits also presents a bottleneck, as it depends on the capacity of EU shipyards to meet the growing demand.

#### 7.4.2 Fishing capacity management benefitting from rebuilding stocks and restoring ecosystems

Managing fishing capacity in the EU requires ensuring that fleet segments are balanced with available fishing opportunities. This balance is a prerequisite for eligibility for public funding. Restoring this balance largely depends on rebuilding fish stocks.

##### Recent trends in exploited stock status

Fisheries in the Northeast Atlantic have improved significantly since 2013, when the current CFP basic regulation was introduced (STECF, 2024c). The number of fish stocks managed at MSY levels has increased, and as a result, overfishing has decreased (STECF, 2025). Overfishing is defined as fishing above the fishing mortality rate ( $F$ ) that corresponds to MSY ( $F_{MSY}$ ).

However, some stocks remain below the biomass level corresponding to MSY. These may still be classified as 'overfished' even though fishing mortality is at or below  $F_{MSY}$ , suggesting that stock levels are expected to recover in future. Other definitions of overfishing are also being considered to capture additional ecosystem impacts, such as habitat degradation and impacts on sensitive species, which may help explain why some stocks fail to recover from being overfished (Bastardie et al., 2024).

The observed improvements in stock status are largely due to reduced fishing effort, a reduction in fleet size, and quota decisions that have aligned more closely

---

78 [https://cinea.ec.europa.eu/funding-opportunities/calls-proposals/pilot-project-fostering-energy-transition-fisheries-sector-demonstrator-fishing-vessel\\_en#details](https://cinea.ec.europa.eu/funding-opportunities/calls-proposals/pilot-project-fostering-energy-transition-fisheries-sector-demonstrator-fishing-vessel_en#details)

with scientific advice, alongside the evolution of societal priorities and policy development. However, some fisheries still target stocks that are not at MSY levels, and excess fishing capacity remains a contributing factor.

In contrast, the status of stocks in the Mediterranean and Black Seas still show overexploitation making fishing segments in this region out of balance with the available resources. However, the percentage of overexploited stocks has been declining, reaching 58% in 2021 (FAO, 2022). While more than half the stocks with validated assessments are still being fished outside biologically sustainable limits, fishing pressure has decreased to what is considered a sustainable level of fishing pressure on average ( $F/F_{MSY} = 0.94$ ; STECF 2025). Despite this overall reduction, a significant number of fisheries continue to target stocks that are far from the MSY level while the depleted stock biomasses still do not show signs of recovery.

### Environmental factors slowing down progress

Environmental factors may play a larger role in stock rebuilding than they did a decade ago in some areas or fisheries <sup>(79)</sup>. In the Baltic Sea, for example, there has been little or no recovery of the Western Baltic Sea herring and cod stocks, despite there being no directed fishery for several years. Climate change is also having a greater impact than ten years ago, as some stocks move north, causing changes in species distribution (European Commission, 2022a).

In response, policies beyond stringent fleet management may need to be triggered, such as reducing nutrient input into sea basins. For example, the Baltic Sea Action Plan <sup>(80)</sup>, which targets reducing eutrophication and other environmental pressures (European Commission, 2022b).

The Southern North Sea provides another example, as rising seawater temperatures, accelerated by shallow waters, are leading to an influx of species from the southern parts of Area 27, including sea bream, sardines and cephalopods (European Commission, 2022b). In some areas and for certain stocks, such as small pelagic species in the Gulf of Lion, environmental factors may currently have a more significant influence in stock rebuilding than recent fishing activity (European Commission, 2022b).

---

<sup>(79)</sup> Climate change and the common fisheries policy: Adaptation and building resilience to the effects of climate change on fisheries and reducing emissions of greenhouse gases from fishing.

<sup>(80)</sup> <https://helcom.fi/baltic-sea-action-plan/>

## **Lack of flexibility for fleet adaptation**

Rising seawater temperatures are putting increased pressure on fishing companies, particularly for those that have fishing quotas for specific stocks that may no longer be accessible, such as cod in the Southern North Sea. A major obstacle is the lack of flexibility in current fleet policy to address the changes in the ecosystem. For example, new fishing methods may be necessary, and vessels may need to participate in multiple fisheries to remain economically viable (Doering, 2023).

In addition, increasing restrictions, such as spatial closures, bans on certain fishing methods to protect bottom habitats, and conservation measures for marine mammals and seabirds, may make it necessary for fishing companies to employ a wider variety of fishing methods (European Commission, 2022b). However, current regulations prohibit vessels from carrying multiple types of fishing gear on a specific trip. This issue has become even more complex post-Brexit, as the UK may apply different rules for fishing gear use in its waters. Furthermore, societal expectations have changed since 2013, with a greater emphasis today on energy transition and on improving social conditions of those working onboard.

### **7.4.3 Fishing capacity management to support the energy transition in the fisheries sector**

Some flexibility in capacity management may be provided by mechanisms such as quota swapping or reallocation of fishing opportunities. In this context, proposals have been made, such as a model of the European GT Exchange Bank (see ERGOSPACE, 2007), to support better use of fishing capacity in GT. This system would consist in collecting all tonnage units withdrawn from fleets and redistributing them to applicants planning new vessel construction.

The development of new type of fishing vessels (European Commission, 2023c) provides an example of a mid- to long-term strategy to remove fossil fuel consumption in the sector by introducing zero-carbon engines. Although the fleet is starting to improve fuel efficiency, more needs to be done to achieve the EU's Action Plan for 2050, for a carbon-neutral fisheries sector (European Commission, 2023e).

The EMFAF operational programmes offer investment opportunities for energy efficiency improvements in most EU Member States. However, eligibility is limited to vessels under 24 metres and already deemed in balance with fishing opportunities. A key concern remains, however, whether fishing companies or individuals with vessels below 24 metres are willing to invest in alternative engines or entirely new vessels, given the high level of uncertainty about the future of the fishing sector.



Reducing uncertainties, such as fluctuations in energy prices, improving predictability on fishing opportunities, expanding bans of certain fishing techniques in more areas <sup>(81)</sup> or increasing safety requirements, would be of great importance to give the fishing sector a longer-term perspective and the security needed for investment in energy efficiency, particularly when it comes to new vessels.

Alternatively, a fleet policy that incentivises investment in less fuel-intensive fishing techniques, or methods that require less GT and/or kW to achieve the same catch volume or value, could reduce the extent of change required for a full energy transition. This would also reduce the need to revise the EU capacity ceilings.

For example, the uptake of innovations and the reduction of mobile bottom-contacting gear could significantly reduce emissions from fishing activities (Alma Maris, 2023). However, alternative fishing methods such as pots or bottoms gillnets, are often not economically viable under the current conditions of reduced stock productivity. In addition, it is not possible to catch the same species for which the company has a quota, unless quotas are exchanged.

#### 7.4.4 Fishing capacity management to promote a new generation to enter the sector

Establishing effective governance and fleet policy to improve the working conditions onboard fishing vessels is often seen as a key requirement to increase the attractiveness of the sector (e.g. Davies et al., 2025). This, in turn, brings a strong argument to push toward modernising the fleet. In its declaration 'Fisheries and Oceans Pact' (European Commission, 2023d), the Commission recognised that the future sustainability and resilience of the EU fisheries sector depend on reaching high standards of safety and working conditions for fishers.

Across nearly all European Member States, the number of fishers has declined since 2013. Employment levels in the EU fleets dropped by approximately 13% in terms of total jobs and by 22% in full-time equivalents (FTE) between 2013 and 2022 (STECF, 2024c) <sup>(82)</sup>. Further to this, too few young fishers are entering the fishing profession. The generational turnover of the sector, an indicator to measure attractiveness, is very low: 58% of crew members onboard EU vessels are aged between 40 and 64, while only 6% of are aged under 24 (STECF, 2019).

In the Mediterranean region specifically, the fishing sector has lost social and economic importance over the last five years. Employment in 2021 was estimated

---

<sup>(81)</sup> See marine action plan COM (2023) 102 final

<sup>(82)</sup> Member State data submissions under the 2023 Fleet Economic data call (MARE/A3/ACS(2023))



at 56 744 total jobs (62% on vessels above 12 m), representing a decrease of approximately 8 700 jobs, or 14%, since 2018 (STECF, 2023). Contributing factors include the high average age of fishers (with over 70% of fishers aged above 40 in countries such as Italy and Greece), difficulties in attracting younger generations, workforce shortages, poor working conditions, and low wages. These issues continue to impact the fisheries sector in the region (STECF, 2024c).

One of the key factors affecting the attractiveness of the sector is the working conditions. Fishing is widely recognised as a hazardous occupation. In 2021, it was ranked fourth among sectors with the highest number of fatal workplace accidents, following construction, transportation and storage, and manufacturing. Furthermore, the European Maritime Safety Agency (EMSA) identified fishing as the most hazardous among all maritime sectors, with fishing vessels representing 64% of vessels lost at sea in 2021 (Schreiber et al., 2024).

While many companies have improved the working conditions on board, especially with newer vessels (less than 5 years old), in reality few vessels have been built in the last 10-15 years. To improve the working and living conditions, future vessels may need to be larger than those in the past. For example, a new vessel concept in Germany (see Annex 11), includes much larger space for crew accommodation.

#### 7.4.5 Engage stakeholders in critical thinking of capacity limitations and barriers

A questionnaire was developed to gather information about unused capacity and possible underutilisation of quotas. As DG Mare provided us with answers from MS to a questionnaire regarding fleet policy (see Section 7.2), a separate collection of information from MS was not necessary. Some of the draft questions were initially shared with participants of the STECF Balance Expert Working Group, and a summary of their responses is provided in Annex 13. With a few suggested changes, the questions were subsequently included in a questionnaire as part of a series of MS case studies (see Section 4.4).

The potential impact of unused or dormant capacity on the risk of overfishing, should it be reactivated, must not be overlooked. Therefore, any recommendation should consider how best to reallocate unused capacity or redirect it toward supporting fleet adaptation to future challenges, including the objectives of the energy transition.

From an economic standpoint, overcapacity results from misaligned incentives within the management system. The main example in the EU has been high subsidies for investments in new vessel construction, which subsequently led to pressure to utilise those vessels (Skerrit et al., 2020). In the meantime, however, in several cases stocks are underutilised (e.g. North Sea plaice). Responses from

the Member State questionnaire elaborate on the reasons for underutilisation, including issues affecting small-scale fisheries and external, non-fisheries-related factors affecting ocean productivity, such as those observed in the Baltic Sea.

## 7.5 Adjustment phase to new management measures in the Effort management regime of the Mediterranean and Black Seas

Historically, management of fisheries in the Mediterranean and Black Seas relied primarily on technical measures, controlling fishing effort by limiting the harvesting capacity of the fleet. Since 2019, however, significant advances have been made in terms of managing fisheries resources through the adoption of several multiannual management plans, at both EU and GFCM levels. Effort regimes have been established for demersal stocks in the Western Mediterranean, for small pelagic and demersal fisheries in the Adriatic Sea, for demersal fisheries in the Strait of Sicily, and trawl fisheries targeting red shrimps (giant red shrimp and blue and red shrimp) in the eastern-central Mediterranean. In addition, catch limits have been introduced for several species, including large pelagics and red shrimps.

As a result, the fishing industry and fleets are undergoing an adaptation phase to align with these new management measures. These changes are having a socioeconomic impact on fishers, with activity levels progressively declining. Fishers must adapt both technically and behaviourally to address and adjust to such changes.

Experience gained from various management actions based on effort reduction and control has identified the following general characteristics and pitfalls associated with effort-based regimes:

- Non-linear relationship: The relationship between nominal fishing effort and fishing mortality appears to be non-linear, and it is often obscured by various factors (e.g. species catchability changing alongside stock status or by a change in trip patterns, targeting and effective effort).
- Effective effort variation: Effective fishing effort can be altered by improved targeting behaviour, skill of individual skippers, technological creep, and hyperstability.
- Monitoring challenges: The assumption that effort is easier to monitor and control than catches does not necessarily hold and can be case-specific.
- Effort metrics limitations: Selecting appropriate effort measures is more complex than for catches, partly due to limitations in available data from VMS and logbooks (e.g. fishing hours, days, kW/days). In addition, metrics such as days at sea are not necessarily appropriate for all types of gear used and the type of fisheries (e.g. netters and longliners).

- Effort displacement: If only some fleet segments or fishing grounds are subject to effort restrictions, vessels will likely move to less regulated segments or areas.
- Latent overcapacity: In effort management, idle overcapacity (inactive and partly active vessels) may remain in the fishery. This may cause a problem when stocks start to rebuild following effort reduction since this latent overcapacity can become active again and undermine recovery efforts.

Because of these challenges, reductions in nominal effort might not translate into lower fishing mortality if fishers are able to maintain high catches. Therefore, monitoring whether catches are also decreasing in line with expectations is essential to assess whether the effort reductions are achieving intended conservation and management objectives.

Effort regimes have been the norm in the Mediterranean because catch limits and TACs/Quota systems have traditionally been considered as poorly suited to Mediterranean bottom trawl mixed fisheries. These fisheries are typically multispecies, increasing the risk of choke species, and landings are widely distributed across numerous coastal and island ports, making it challenging to implement control and ensuring compliance.

However, recent developments in the Western Mediterranean Sea Multi-Annual Plan have introduced catch limits for red shrimps (giant red shrimp, *Aristaeomorpha foliacea*; and blue and red shrimp, *Aristeus antennatus*). These trawl fisheries operating on the epi-bathyal fishing ground and target only these two species, with a relatively small bycatch, making them suitable candidates for a catch limit system. However, recent developments in the Western Mediterranean Sea Multi-Annual Plan (West Med MAP), generally an effort management plan, have introduced catch limits for red shrimps (giant red shrimp, *Aristaeomorpha foliacea*; and blue and red shrimp, *Aristeus antennatus*) as remedial measures. These trawl fisheries operate on epi-bathyal fishing grounds and target only these two species, with a relatively small bycatch. As such, they were considered suitable candidates for implementing a catch limit system. Nevertheless, the effectiveness of these new catch limits, particularly in terms of control and enforcement, and their impact on stock status has yet to be evaluated, although STECF regularly evaluates the West Med MAP regularly (e.g. STECF 25-11).

## 8 Summary and Recommendations

This study provides a thorough analysis of the current state of the EU fishing fleet and explores the main drivers behind its evolution, with the aim to inform future management strategies. The study used findings of previous investigations into the past, present and future development of fishing capacity, in order to summarise the key findings, future challenges and provide general recommendations for managing fishing fleet capacity in Europe.

The historical policy background and key milestones that have shaped EU policy (see Section 2) are compared with the capacity management approaches of fishing fleets in non-EU countries (see Section 5) to highlight similarities, differences, and positive examples relevant to the EU fleet policy. This EU policy is examined against the findings on recurrent imbalances between fleet capacity and available fishing opportunities, together with a review of the factors that contribute to such imbalances (see Section 4).

One aspect of imbalance concerns whether the capacity is currently managed at a data resolution that is most relevant, namely by fishing area, targeted species, and gear type (Section 3). The study also considers if other monitoring methods can help policymakers in designing a transition path toward a renewed fleet policy and management framework for the EU fishing fleet (see Sections 6 and 7).

Addressing the energy transition of the fishing fleet must consider ways for maintaining strict measures on fleet capacity to remain within ecological limits, as required by the European Green Deal and 2030 Biodiversity Strategy. Within the CFP, **the challenge is to ensure this energy transition towards cleaner propulsion systems, improved working conditions, and greater crew comfort, is done without increasing the ability to catch fish, as imbalances are already occurring.** Fleet renewal is also ineligible for EU funding for fleet segments out of balance. The fleet renewal should be based on the objective that *“the fishing and aquaculture activities are environmentally sustainable in the long-term and are managed in a way that is consistent with the objectives of achieving economic, social and employment benefits, and of contributing to the availability of food supplies.”* (Article 2 of the 2013 CFP).

Fisheries regulations are intended to maintain fishery resources and ensure sustainable fishing practices. Such regulations include managing fishing capacity by imposing limits on vessel tonnage and engine power, as well as prohibiting public funding for the construction and modernisation of fishing vessels and equipment. According to the WTO and bodies like the OECD and UN FAO, **public funding for fleet renewal may lead to harmful subsidies that directly or indirectly contribute to overfishing or overcapacity.** For this reason, the total capacity of the EU fishing fleet is capped to prevent too many or too large vessels from competing for limited fish stocks, a situation that could reduce profitability and increase the risk of overfishing.

As demonstrated by five case studies examined in this study (North Sea demersal fisheries, Spanish fleet in Atlantic North Western Waters, Portuguese fleet in EU external waters, Polish fleet in the Baltic Sea, and Western Mediterranean fleets), there is no guarantee that the current limitations on fishing capacity are sufficient to ensure the fleets are balanced with the available resources. Despite some progress, EU indicators show that many fleet segments remain imbalanced, while climate change, and other environmental factors external to fishing, may further exacerbate these imbalances. A lack of flexibility in fisheries opportunities reallocation among operators also contributes to the problem.

Achieving a better balance between fleet capacity and fishing opportunities would not only ensure the fishing industry is eligible for public aid, but also make it possible for vessel modernisation without public aid whenever healthier fish stocks make fisheries more profitable. To better understand the drivers to such imbalances, the study presents a summary of the key drivers as perceived by the stakeholders consulted across the case studies:

- **Biological uncertainties:** The case studies highlight ongoing biological uncertainties affecting fish stocks, such as hake stocks in the Western Mediterranean, which remain below target precautionary biological reference levels points, despite targeted effort reductions; and stock fluctuations impacting the economic viability of the Baltic Sea fleet. Additionally, inherent natural variability and regulatory measures affecting catch limits influence operational capacity, while quota shortages and mismatches between fishing capacity and available opportunities remain key challenges in EU external waters.
- **External factors affecting fishing:** While the COVID-19 pandemic had minimal overall impact on profitability in the Western Mediterranean (largely due to reduced fishing activity and lower fuel prices, which helped contain operating costs), it significantly affected the profitability of the fleet in the Atlantic North Western Waters. In addition, the energy crisis, driven by Russia's unprovoked aggression against Ukraine led to increased energy costs, negatively impacting fleet operations. Market demand and price variations also affect profitability and the sustainability of fleets, as demonstrated in the Baltic Sea case. Furthermore, climate change and pollution pose uncertain threats to fish stock productivity and mortality.
- **Insufficient consideration of socioeconomic aspects:** Stakeholders from POs in the Western Mediterranean case study criticized that measures aimed at reaching fleet balance are based primarily on biological stock data, while sometimes neglecting economic and social aspects. In the Atlantic North Western Waters, the study identified a lack of socio-economic studies on market conditions. Further research is needed to understand how the market conditions impact the economic performance of fleet segments, both in the Western Mediterranean region and in the Baltic Sea, where employment levels and community dependence on fishing play an important role. In the Baltic Sea, this lack of sufficient analysis of socio-economic factors may have led to non-

compliance with sustainability goals and conservation measures, further exacerbating the imbalance situation.

- **Low flexibility in fishing opportunities:** In both EU external waters and the North Sea, stakeholders pointed to limited flexibility in quota swaps, partly due to difficulties in identifying acceptable compensation. This issue is linked to possible deficiencies in vessel scrapping programmes and inadequate incentives, particularly where compensation is interpreted as corporate profit and taxed fully. Scrapping programmes primarily target older vessels, which are generally less efficient and contribute less to the harvesting capacity than newer, more technological advanced vessels. In the Baltic Sea and other regions, subsidies and financial incentives from national and EU programmes also influence fleet modernisation and adaptation. While technological advancements improve fishing fleet operations, they do require financial investment.

Despite the current EU fleet policy (2013 CFP, Articles 22 and 23), a key present and future challenge remains to limit the risk of imbalances between fleet capacity and available fishing resources. Adhering to the scientifically advised TACs, effort limitations, and other regulatory measures should help mitigate the risk of overexploitation. Further reducing this risk in line with the precautionary principle (2013 CFP, Article 2) **may result in some under-exploitation in the short-term, but it would help the EU fleet regain balance in the longer-term.**

It is not clear if facing future challenges, such as energy transition, attracting young fishers, and improving profitability, may require extra capacity to accommodate more efficient or alternative engines for greener fuels, and better working conditions, given that the country-specific capacity ceilings limiting the fishing capacity are not reached. However, current policies may impact profitability of the current active fleet by limiting, for example, the catch storage space on board. Besides, energy efficient measures cannot be the only solutions, as the scope of retrofitting remains limited due to the average age of the EU fleet, and, in most cases, , extensive upfront costs that cannot be paid back. Moreover, introducing new, more energy-efficient new built vessels require removing an equivalent amount of capacity from the fleet. Similarly, modernising existing vessels by increasing their internal volume is not allowed unless that added gross tonnage is offset elsewhere in the fleet.

An overarching challenge of the fishing sector is to make optimal use of the capacity available or substitute it with modernised tools. If this is not sufficient, the EU may need to offer more flexibility in fleet renewal policies to allow modernisation without permanently reducing fishing capacity. At the same time, **EU fleet policy should continue ensuring that fleet renewal and modernisation**, which may require additional capacity or not, alongside improved efficiency over time, **does not result in an improved ability to catch fish** that would exacerbate fleet imbalances, create overcapacity, or put more pressure on exploited stocks.



Fleet renewal is complex because technological improvements are regularly introduced that increase vessels' effective ability to catch fish (i.e. the harvesting capacity) without altering their physical characteristics, such as vessel size, kW or GT, nor necessarily contributing to the energy transition. As a result, fishing capacity may increase through technological change rather than through fleet expansion.

This challenges the needs for additional capacity, given that the ability to fish can already increase without changing the vessel's size or capacity. Based on this, it is still unclear whether there is a need for additional fishing capacity, as the physical fleet size may no longer be the only indicator to monitor and control. While it has traditionally been assumed that greater fleet capacity leads to increased fishing pressure and more overfishing, this relationship may be more complex and merits further examination. Also in the future, better monitoring using new tools, such as electronic monitoring, Artificial Intelligence (AI) and digitalisation, may be used to mitigate risks and help control fishing capacity.

For some fleets (e.g. demersal trawlers), a correlation exists between vessel size (GT and kW) and catch rates. Strong correlations, such as when larger vessels use bigger nets, can be monitored using current metrics (GT and kW). However, in cases where the correlations are weak (e.g. vessels operating passive fishing gears), additional metrics, such as gear size and geometry, are necessary. In this context, the study recalls that it may be worth considering a "limit on the maximum gear size that a vessel could operate". Hence, where GT poorly reflects how much a vessel can catch, particularly when gear characteristics are the main drivers, focusing solely on controlling for gear geometry and size instead of GT poses its own challenges. For example, a single vessel may operate several gear types, and such an approach would require gear size or geometry to be recorded and accurately reported.

If adding more capacity does not always lead to an increase in the ability to catch fish (i.e. the harvesting capacity), then similarly, removing kW and GT fishing capacity from the fleet under the entry/exit scheme limitation (as stipulated in CFP Article 23) is not expected to reduce harvesting capacity proportionately. This is because kW and GT are not always relevant to measure the harvesting capacity, as the catching method and vessel size are both major drivers of a vessel's "ability to catch fish".

The study also identifies a range of different factors that should be considered when calculating the harvesting capacity of a vessel. There exists a trade-off between onboard space for harvesting capacity, energy transition and safety. These can be resolved by increasing vessel size and/or increasing the rate of filling the fish hold (e.g. higher catch rates). Further to this, the study indicates



that different gear specifications, such as gear size, mesh size, number of hooks, and net length, will affect harvesting capacity, yet these are not monitored <sup>(83)</sup>.

Furthermore, the effects of technological improvements must be taken into consideration and reflected in the analysis when assessing the feasibility of increasing a vessel's GT and/or kW without increasing its ability to catch fish. Our findings indicate that current capacity metrics require further refinement to avoid unintended fleet imbalances occurring if fishing capacity allowance levels are changed.

### Regarding Gross Tonnage (GT)

Gross Tonnage (GT) approximates the total internal volume of a vessel. In contrast, the Net Tonnage (NT) ideally accounts only for the cargo volume, excluding space for accommodation, the engine room, and other non-cargo spaces. However, the study found that the current NT declarations do not necessarily reflect the actual cargo volume on fishing vessels. Besides, in the absence of a robust method to split GT into meaningful subcomponents, such as GT\_energy\_transition, GT\_safety, and GT\_welfare, and to distinguish these from GT\_harvesting\_capacity, it is not possible to lift the capacity ceiling for GT subcomponents that would be unrelated to harvesting capacity.

The study found that such a split is challenging to implement in practice, besides adding an additional layer of complexity to fleet management, as some solutions cannot contribute to modernisation without increasing the ability to catch fish. In particular, the fish hold volume (FHV), which is closely linked to harvesting capacity is currently not being monitored. Therefore, it is essential to begin measuring and monitoring FHV based on other more readily available information, such as the length of the vessel or GT, when estimating the harvesting capacity. The complexity of changing vessel size also arises when, for example, adding a bulbous bow, that helps to make the vessel more hydrodynamic and therefore more energy-efficient, may create additional room to store fish (if not a solid, sealed bulb). This requires strong control and enforcement. In addition, given GT is calculated differently for vessels above and below 15 metres LOA, there is an incentive to retrofit vessels by making them wider to increase storage capacity, but also thereby making them unsafe.

To support the energy transition in fishing fleets and improve safety conditions for workers, a **thorough comparison of how vessel size affects harvesting capacity would also be conducted**. This analysis should be completed before considering any changes to the current restrictions on vessel length, to avoid

---

<sup>(83)</sup> But see COMMISSION IMPLEMENTING REGULATION (EU) 2025/2196 where gear dimensions and specifications will have to be monitored from 2026 onwards as specified in Annexe Tables XV and XVI.

recommending solutions that would increase the vessel's harvesting capacity in situations of imbalance.

### Regarding vessel engine kW

Some modernisation solutions (such as the use of greener fuels or batteries) that add extra weight to vessels may require an increase in engine power (kW). However, **increasing kW would be counterproductive, as future technological developments are also expected to reduce kW needs**, whereas increasing kW poses a higher risk of increasing pressure on stocks.

Controlling and monitoring kW is also challenging. Potential non-compliance related to engine power has been reported. A 2019 EU report found that many Member States either lack effective engine power certification and verification systems or have none at all. Information showed measured engine power exceeded certified values in 51% of verifications, with 16% of vessels found to be non-compliant. To register engine kW accurately and prevent the undermining of fishing effort regimes, improvements in certification and verification systems are necessary, as well as more audits by national authorities. In this endeavour, the EC has recently published technical guidance for the monitoring, certification and verification of engine power in EU fisheries control (European Commission, 2025d).

## 8.1 Recommendations for improving the management of the EU fleet

Given these findings, the following recommendations are proposed in order of priority to support better management of the challenges (fleet renewal and vessel modernisation for the energy transition and better and safer working conditions) and the future of the EU fishing fleet:

### Recommendation 1 – Conduct Member States (MS) and segment-specific studies to evaluate whether there is a need for additional capacity

As a preamble, allowing extra space onboard vessels for the required modernisation solutions only makes sense if the fleet segment is considered to be in balance with the available fishing opportunities.

This study has documented the current fishing capacity of the EU fishing fleet. However, a closer monitoring of the reported fishing capacity is required given the various issues raised in the self-reported Member States' data, as found by the EU's external independent court of auditors (ECA 2017). In any case, the reported figures highlights that, in some cases, the actual fishing capacity of individual Member States is well below capacity limits. In this context, Member

States could use their available capacity to address modernisation, energy transition needs, and fleet renewal, given the key challenges the fishing sector will face in future. For some other cases, while some EU countries maintain a reserve margin of GT or kW to allow for flexibility, these margins are maybe limited. Therefore, **targeted studies at both the Member State and fleet-segment level are required to evaluate whether sufficient capacity remains available for future changes alongside different levels of ambition.** Without such documentation, country-specific data, and evidence demonstrating that gains resulting from fleet adaptation would be insufficient to catch the same volume, it remains unclear whether additional capacity is required.

Hence, **there is a need to continue efforts to provide tools to evaluate and assess the onboard space requirements associated with energy transition solutions or other modernisation equipment.** These tools should be used to determine to what extent Member State capacity ceilings would be exceeded, after accounting for future adaptations, if such solutions were implemented across all currently active vessels.

These baseline studies would be a starting point for Member States to plan fleet capacity use for modernisation. Part of both the existing and “virtual” GT and kW capacity should be reserved for improvements in safety, better working conditions, and sustainable technologies, governed by rigorous control mechanisms. **While vessels may need increased GT capacity to improve energy efficiency and onboard conditions, increases in kW are not necessarily required.** It is therefore essential to establish procedures to control modernisation metrics without affecting the vessel's fishing ability.

Besides this, the most suitable level for implementing capacity and effort limitations may be based on fisheries. When segment definitions are too wide, as under the current EC Data Collection Framework (EC, 2014), a single segment may include vessels operating in several different fisheries. In such cases, fisheries managers are unable to identify which specific fisheries within a segment are experiencing excess capacity, how large that excess is, or what drives it. This lack of precision may result in action plans being requested for fisheries that are already balanced. By managing fishing capacity per fishery, each fishery might ultimately be individually authorised with a maximum capacity allocated to clearly defined fishing activities. Such an alternative segmentation in managing fleet capacity would, however, call for a standardisation of capacity units, so that comparison among fisheries would account for differential catching power.

Further analysis to examine different fleet segments will be important for understanding the specific operational requirements of various fisheries, such as gear size, gear type, vessel mobility range, and fishing areas. These insights per fishery type will help to develop capacity adjustments more precisely to the needs of each segment of the EU fleet, as well as accounting for potential changes in the overall ability to catch certain stocks.

Ultimately, estimates of additional capacity needs may be scaled up to the level of the entire Member State fleet by combining the individual requirements on a fishery-by-fishery basis. Prototype vessels developed without the constraints imposed by the current EU regulations (European Commission, 2023c) already exist and findings show that scaling-up modernised designs across the entire EU fleet would be a costly investment.

## **Recommendation 2 – Distinguish vessel volume unrelated to harvesting capacity**

### **Recommendation 2a – Decompose vessel volume**

Technical engineering expertise can advise on possibilities for decomposing the overall GT allowance into subcomponents that address different functional purposes, such as GT\_safety, GT\_energy\_transition, GT\_ability\_to\_fish, and GT\_wellbeing.

Naval architects could suggest alternatives to GT metrics and assess how easy it is to distinguish between GT components based on their intended function. The drafting process would list all the pieces of equipment that contribute to improved safety and working conditions, and how to measure their GT. These include, superstructure above the deck (e.g. covering the deck to protect the crew against weather conditions); adequate and well-separated living space sufficiently insulated against noise and installed above the deck to avoid risk for submersion; dedicated cabin space for onboard observers; improved visibility from the bridge to the deck; and additional ballast systems to improve vessel stability.

In terms of measuring fleet capacity in kW, some stakeholders may argue that additional engine power is also required for improving fishing vessel safety, particularly in bad weather conditions.

The possibility of decomposing the overall GT allowance into subcomponents addressing different purposes (i.e. GT\_safety, GT\_energy\_transition, GT\_ability\_to\_fish, GT\_wellbeing) should be approached with caution and carefully designed. Once extra capacity is granted to a fishery, it would be extremely challenging to reduce it later, especially if it exceeds the available fishing opportunities. This is due to the long lifespan of fishing vessels, which makes capacity adjustments costly and inefficient, potentially wasting assets and resources. Furthermore, fish stocks are inherently variable that cause fluctuations in fishing opportunities that may conflict with previously agreed capacity limits. This risk of persistent imbalance is more likely for highly- specialised fleets, which have less flexibility to adapt to changing stock availability.

## Recommendation 2b - Control and monitor vessel volumes (GT) and engine power (kW)

Lifting the GT ceiling should be considered only as a last resort, as it may entirely remove limits on fishing capacity due to the currently high risk of inaccurate reporting of vessel kW. The monitoring, control and surveillance department in each Member State must ensure compliance with kW limitations.

Controlling and monitoring both the extra onboard space allowances and engine power remains essential to prevent unintended increases in fishing capacity. While vessel widening and lengthening may be acceptable, this should only be permitted under robust control procedures that ensure any additional GT is used to improve safety, working conditions, or support the energy transition. With respect to GT, controls should be considered for unintended impacts, such as storing catches in living spaces. The study found that, in the example of Spain, increases in GT granted for safety concerns came with additional facilities for storing more nets, and onboard infrastructure. These changes were also found to reduce vessel stability.

Due to potential non-compliance, new legislation has been developed to prevent the installation of engines that exceed the vessel's licensed power. For example, Italy restricts engine types, as operators are not allowed to install an engine type if the engine manufacturer's product range includes a less powerful engine model that also equals or exceeds the vessel's licensed power. A restriction that could potentially reduce the likelihood of high-impact infringements.

According to the Control Regulation ((EC) No 1224/2009), EU Member States are responsible for monitoring the capacity of their vessels and verifying that they align with officially stated tonnage and engine power. For certain categories of catching vessels with a high risk of non-compliance, the use of devices that continuously monitor engine power shall be required as of 10 January 2028 (as outlined in the amendments to the Control Regulation EU Reg 2023/2842). Articles 38, 39, 40 and 41 of the 2023 Control Regulation (concerning "Fishing Capacity") state that Member States are responsible for the certification and verification of engine power <sup>(84)</sup> and the verification of tonnage.

The European Commission is required to adopt implementing acts, laying down detailed rules concerning the installation, technical requirements and characteristics of continuous engine power monitoring devices that will apply as

---

<sup>(84)</sup> To support Member States in the full and harmonised implementation of a suitable system for monitoring, certifying and verifying the engine power in accordance with applicable EU regulations, the European Commission published [Technical guidance for the monitoring, certification and verification of engine power in EU fisheries control](#) (European Commission, 2025d).

of 10 January 2028 <sup>(85)</sup>. More specifically, these acts define rules focusing on verifying (a) engine power of catching vessels, (b) tonnage of catching vessels, and (c) type, number, and characteristics of the fishing gear. Specifically, Article 41 addresses the verification of kW, while the newly introduced Article 41a, applicable as of 10 January 2028, addresses the verification of catching vessel tonnage. The EC may use technical engineering expertise, e.g. naval architects, to help draft the requirements for verification into such implemented acts.

The EC could also make the reporting of the power of auxiliary engines mandatory, at least in vessels where a considerable percentage of fuel consumption is derived from auxiliary engines.

### **Recommendation 3 – Consider the redistribution of fishing capacity**

#### **Recommendation 3a - Develop adapted governance**

Stakeholders have identified various drivers for future fleet rebalancing by redistributing the capacity among segments. These include aligning fleets with new safety and energy transition standards and promoting a trend toward fewer, larger vessels with innovative engines, which could lead to internal capacity shifts within the fleet (North Sea case study). In addition, stakeholders raised concerns about low capacity due to cessation schemes, and suggested that diversifying catch portfolios (i.e., the number of species targeted by an operator) and fishing techniques for both quota and non-quota species, might help mitigate these negative impacts.

It is advisable to encourage Member states to take action for converting or reallocating capacity from imbalanced fleets toward those fishing practices with lower impacts on the environment. The CFP governance framework already incentivises the redistribution of GT or kW across fisheries (e.g. Article 17 of the 2013 CFP), to maintain capacity and to reduce overall harvesting capacity for overfished stocks. One way to help rebalance fleet segments would involve either removing or redistributing capacity and fishing effort toward underexploited stocks, where possible. This could eventually allow stock recovery with subsequent fishing opportunities increase, as those opportunities are biologically determined and cannot be increased without being sustained by the stock. However, contrary to permanent reallocation, stakeholders suggested more flexibility in catch or effort limits and in reallocating effort among fleet segments, as fleet imbalance is often perceived by operators as being driven by temporary issues such as insufficient quotas, labour shortages inducing inactivity, and soaring costs, and, in the longer-term, by ineffective scrapping programs. The

---

<sup>(85)</sup> To assist Member States in preparing for these new rules, the European Commission published [Technical specifications and guidance for the implementation of devices for the continuous monitoring of catching vessels' engine power](#) (European Commission, 2025d).



Atlantic Western Waters case study shows that an imbalance in biological indicators makes them more likely to be also at risk of economic imbalance. This is different from other cases where fisheries remain biologically sustainable, but are economically imbalanced due to rising costs or market changes.

### Recommendation 3b - Consider market incentive-based instruments for fleet management

For **large-scale fleets**, a framework for market-based instruments could be introduced to motivate private investment in fleet adaptation. A review of international cases indicates that the use of market-based instruments enables fleets to adapt to fishing opportunities:

- **Promote the governance for individual quotas.** In the short term, using individual quotas with a certain degree of transferability, or total transferability (ITQs), can provide flexibility for fleet adjustments. Currently, some Member States allow the transfer of individual rights among fishing vessel owners on a permanent or temporary basis, depending on whether the transferring vessel is decommissioned or not. When individual quotas are not transferable, the removal of an old vessel means that the vessel owner is not able to transfer the quotas of the decommissioned vessel. This is particularly relevant whenever the removal of the capacity is not from public aid (Article 23 of the 2013 CFP). Thus, incentives to remove this capacity are scarce.
- **Former vessel owner to hold the license detached from the vessel.** In the long term, market-based instruments can be used to facilitate the use of licenses when vessels are decommissioned. Licenses are generally tied to a vessel and in some cases also to individual catch rights. Additional flexibility to allow the removal of a given fishing vessel, while also allowing the owner to hold the license temporarily, may provide incentives to adapt the fleet to new needs. This would allow the owner to trade the license and quotas with other vessel owners for fishing purposes, or the license for the adaptation of the fishing vessel to environmental protection and crew habitability. The UK is an example of the use of licenses detached from a physical vessel ("license entitlements"), where these virtual entitlement licenses are included in the UK fleet register instead of vessel licenses for a period of three years.
- **Possibilities for quota swaps and quota (harbour) pools.** The need for quota redistribution would require more flexibility, which should be aligned with what is found in Section 4 (i.e. rights-based management). Quota swap and exchange also provide flexibility to adapt (North Sea case study – see Annex 2) and are also highlighted as a desired approach in the Baltic Sea case study. In the case study of Portugal, for example, enhanced cooperation between Portugal and Spain on quota sharing could help resolve the issue and ensure fleet sustainability. Increased involvement of



co-management in quota appropriation could help reduce social and economic impacts associated with quota usage and fleet inactivity. This could be addressed with quota pools managed by (harbour) communities or Producer Organisations. In addition to allocating rights among quota-pool members as needed, avoiding quota underutilisation would also require, for example, more flexibility regarding target species, as vessels may no longer be able to remain highly specialised in certain fisheries. This would allow them to target alternative species during periods of low stock abundance - see for instance, examples of POs allocations among their members (e.g. Denmark within North Sea case study, or the United States).

For **small-scale fleets, market incentive-based fleet management and sector-specific solutions**, such as direct sales, could be prioritised. In redesigning the fleet, these strategies offer the potential to promote economic sustainability alongside reducing catch volumes to remove situations of imbalance and support energy transition:

- **Local market development.** Direct sales require specific port facilities and depend on the species landed. Small-scale fishers need access to processing structures, particularly for local consumption.
- **Promote governance for better catch valuation.** Operational constraints such as landing times are crucial to ensure timely delivery to the retail sector and maintaining product quality. Some fishing practices have evolved from high volume catches to more selective practices, with fishers now sorting species and package them in smaller units (e.g. 10 kg containers) to better respect and value the resource.
- **Transitioning from high- to low-impact fishing gears.** Promoting small scale fisheries often offers several comparative benefits, including reducing the carbon footprint, minimising environmental impact per unit of effort and help limit the risk of overfishing in certain fisheries. Energy transition also aims to decrease fossil fuel use, while increasing economic viability and resilience. This is often the outcome of using passive gears, which help minimize seafloor impact and improve selective fishing. Using the entry/exit scheme under Article 23 of the 2013 CFP can help the transition from high- to low-impact fishing gears. This transition can reduce energy consumption, preserve coastal jobs, and maintain social fabrics and infrastructure.
- **Costs and feasibility:** The transition involves significant initial capital and installation costs, and the payback time depends on operating and maintenance costs over vessel lifetime. Feasibility studies are needed to assess economic returns, considering future fuel availability, fishing opportunities, capacity flexibility, market conditions, and disincentives for a change like fossil fuel tax exemptions. A critical factor for success in

ensuring the transition, while limiting the risk for overfishing, is reducing the primary concern of the lack of fish. Clearly, without sustainable fish stocks, transition efforts will be inefficient.

#### **Recommendation 4 – Continue EU fleet management in support of the fisheries management objectives**

- ***Increase vessel efficiency while continuing implementing catch and effort limits.*** A fundamental challenge in limiting fishing capacity is that gains in efficiency are often needed to improve the economic performance of certain fleet segments, particularly smaller vessels operating at the edge of profitability. Limiting effort is often seen by some stakeholders as precisely inefficient and counterproductive, as it can lead to deliberate operational inefficiencies and, for example, wasted steaming time when forced to return to port by limitations on trip duration. This was shown in the Western Mediterranean case study, where some fleets could have been compensated with public aid to compensate for temporary inactivity and maintain a fleet presence. The justification for such financial support is the fact that reducing the number of allowable fishing days may disproportionately impact different operators: larger vessels, which are at the greatest financial risk, as their operational days fall below the threshold required for economic viability; and smaller vessels, even if having smaller operating costs, in case their catch rates are far below large operators. Low efficiency can also lead to poorer working conditions on board vessels and make the profession less appealing to younger generations. In addition, an ageing fleet sometimes encourages fishers to work harder to compensate for reduced efficiency, which can lead to the overexploitation of fishery resources. However, gains in efficiency are also a driver for overcapacity, increasing the risk for overfishing EU fish stocks on board vessels and make the profession less appealing to younger generations. Effective fleet management for rebalancing the EU fleet should focus on setting precautionary catch and effort limits and regulating gear, rather than restricting upgrades that enhance safety, working conditions, and environmental performance.
- ***Remove barriers that prevent full quota uptake.*** There is a need for the fishing industry to explore mechanisms to address quota underutilisation, likely caused by choke species, such as selective gear innovation and spatial management. In the NEA region, an increasing number of fish stocks are showing underutilised fishing opportunities. While choke effects likely contribute to this, other factors, such as high costs of fishing, low market prices reduced stock status, and general degradation of marine habitat, may also play a role. Modernising fishing vessels and adapting to energy transition can improve safety, attractiveness, profitability and sustainability. However, regulatory frameworks may evolve to support technological innovation and optimize fleet capacity.

- **EU and MS to ensure sustainable fishing as a prerequisite for funding eligibility.** A primary barrier for a fleet segment to access public aid, such as EMFAF, is the lack of balance between fishing capacity and available fishing opportunities. This requirement is necessary to continue reducing the risk of overfishing in EU waters. However, this has contributed to the underutilisation of EMFAF for fleet transition. For example, there has been a low number of applicants to Article 18 <sup>(86)</sup>, and no applications for Article 19 <sup>(87)</sup> (as of July 2024, Schmuedderich et al. (2024)).

### **Recommendation 5 – Control unintended side effects of effort-based management and complement with catch limits**

It is advisable to continue limiting fishing mortality by restricting the number of days at sea specific to fleet segments (e.g. coastal versus deeper water fisheries). In imbalanced situations, there is a need in fisheries management to continue limiting the ability to catch fish with an effort control.

- **Accounting for technological improvements.** Effort control often incentivised technological innovations that challenged fisheries management, whenever a fleet management monitoring, for the same fishing capacity, would fail to capture improvement in harvesting capacity. In reaction to effort control, fishers can bypass input controls. For example, when limits are placed on the number of or size of vessels, fishers may adapt by increasing boat size or engine power to maintain or even increase their fishing capacity. Besides, coastal fisheries are particularly sensitive to weather conditions, limiting available fishing time. While larger vessels can operate in rougher sea conditions, they may increase the risk of accidents, and operating trawl gear in rough weather remains less effective. Control for unintended side effects of an effort-based management regime would include a regular control for the change in catch efficiency. Input controls should be carefully tailored to local circumstances and complement, rather than substitute, output controls.

The implementation of catch limits may be promoted to avoid relying on effort control only, which could have inadvertently led to an ageing fishing fleet not equipped to operate in rough offshore areas, thus encouraging more fishing in coastal areas. A shift in fishing effort can lead to overexploitation of coastal resources, which are important habitats for

---

<sup>(86)</sup> Article 19 of EMFAF states that increases in GT can be financed for safety, better working conditions, and better energy efficiency, if they do not increase fishing capacity (i.e. in this case, the harvesting capacity)

<sup>(87)</sup> EMFAF Regulation Article 18c and d “other vessels up to 24 metres in overall length, the new or modernised engine does not have more power in kW than that of the current engine and emits at least 20% less CO<sub>2</sub> compared to the current engine.”

commercial species. In addition, fishing in coastal areas can lead to conflicts between different fishing segments, further exacerbating resource depletion.

- **Investigate ways to reduce preference for over motorised kW engines.** Some propulsion setup exists where the installed engine provides more power than the vessel strictly needs for its primary fishing operations. In parallel, opportunities exist to install lower kW engine requirements by promoting fuel-saving technologies and encouraging the adoption of vessels and fishing techniques with reduced kW requirements. This can help ensure that increases in catch efficiency do not come with more harvesting capacity that could compromise sustainability.

### **Recommendation 6 – Work toward reducing uncertainty in catch advice, and revise EC 2014 guidelines for evaluating balance that better link to the risk of overcapacity**

- **Fishing below  $F_{MSY}$ :** Catch advice would be promoted with better coverage and more reliable stock assessment (e.g. North Sea case study, Western Mediterranean case study), also including setting fishing opportunities aligned with environmental factors external to fishing which currently decrease ocean productivity (e.g. pollution, climate change). In this context, there is a fundamental contradiction between the fishing sector's desire for stable fishing opportunities over several years and the inherent fluctuations of natural living marine resources, added to ocean productivity trending toward unknown levels (due to climate change and other factors). To reduce these fluctuations, it may be advisable to fish with more caution, which means operating slightly below the MSY. This approach can help to increase the stability of the expected yield and safeguard the long term economic and social capital already invested by the public and private sectors in fisheries (Bastardie et al. 2024).
- **Improve data collection and revise the “balance” indicators to capture drivers of overcapacity:** Evaluating balance with improved indicators (North Sea case study, Western Mediterranean case study, etc.) will be beneficial once data collection is improved. There is a need for disaggregated data on fleet balance indicators (as shown in Section 2, and stakeholder responses in case studies), also as a support for robust socio-economic analyses. This includes investigating analyses of the reasons why fishing quotas are not fully used and including quota uptake as an extra indicator of balance. An increasing number of fishing quotas are no longer being fully utilised in the NEA, for example. There are several reasons for that, including loss of resilience and degraded productivity that prevent catching of the fish, or lack of capacity, and, for each fish stock, there may be specific reasons why the quotas for these stocks are not

fished up to 100%. This is counterintuitive to the discussion on overfishing of stocks in the EU and is a hindrance to improving the supply of fish within the EU. Therefore, this should be analysed and measures developed to improve the uptake of quotas in cases where stocks are not at risk of overfishing, including acknowledging for possible ecosystem effects and habitat restoration to support long-term ocean productivity.

To conclude, this study has identified a few potential pathways towards renewing and modernising the EU fishing fleet. Clearly there are challenges to overcome, and a core challenge for fleet management that aimed at controlling fishing capacity is that efficiency improvements are often essential for enhancing the economic performance and viability of certain fleet segments. The study concludes that the goal of fleet management should not be to reduce individual vessel efficiency, but rather to manage fleet-level efficiency so as to ensure a sustained balance with fisheries opportunities. Achieving this balance is a prerequisite for successful EU fleet renewal alongside an energy transition towards low carbon low-impact fisheries. There are also challenges that go beyond the realm of fishing alone, but it is timely to consider now the evolution of the EU's fishing fleet towards a sustainable, profitable sector attractive to the next generation of fishers, as well as to consumers wishing to purchase EU-caught fish. This contributes to the vision that aims to foster resilience, competitiveness, and sustainability, by managing EU fishing fleets while contributing to securing European food sovereignty and advance on the European Ocean Pact.

## 9 References

- Aalbers, A., (2018). Analysis on Gross Tonnage and Propulsion Power ceilings. <https://www.chil.me/download-file/4bd3f613-0ecc-455b-a6ec-60262363eb24/analysis-on-gross-tonnage-and-propulsion-power-ceilings>
- Alma-Marís. (2023). A pathway to decarbonise the EU fisheries sector by 2050. Report produced for Oceana Europe by Alma Marís Consulting. 96 pp.
- Aleixendri, C., 2021. bound4blue installs its eSAIL system on the fishing vessel “Balueiro Segundo”. <https://bound4blue.com/bound4blue-installs-its-esail-system-on-the-fishing-vessel-balueiro-segundo/>
- Ammar, N.R., (2019). An environmental and economic analysis of methanol fuel for a cellular container ship. Transportation Research Part D: Transport and Environment 69, 66-76.
- Asche, F., Bjørndal, M.T., Bjørndal, T., (2014). Development in fleet fishing capacity in rights based fisheries. Marine Policy, 44, 166-171.
- Auditors, E.C.o., (2011). Have EU measures contributed to adapting the capacity of the fishing fleets to available fishing opportunities? EUR-OP.
- Baird-Maritime, (2021). VESSEL REVIEW | Libas – Hybrid seiner/trawler delivered to Norway's Liegruppen. <https://www.bairdmaritime.com/fishing/fishing-boat-world-reviews/vessel-review-libas-hybrid-seiner-trawler-delivered-to-norways-liegruppen>
- Balcombe, P., Brierley, J., Lewis, C., Skatvedt, L., Speirs, J., Hawkes, A., Staffell, I., (2019). How to decarbonise international shipping: Options for fuels, technologies and policies. Energy conversion and management 182, 72-88.
- Bastardie, F., Hornborg, S., Ziegler, F., Gislason, H., Eigaard, O.R., (2022). Reducing the fuel use intensity of fisheries: through efficient fishing techniques and recovered fish stocks. Frontiers in Marine Science, 9, 817335.
- Bastardie, F., Feary, D. A., Brunel, T., Kell, L. T., Döring, R., Metz, S., Eigaard, O. R., Basurko, O. C., Bartolino, V., Bentley, J., Berges, B., Bossier, S., Brooks, M. E., Caballero, A., Citores, L., Daskalov, G., Depestele, J., Gabiña, G., Aranda, M., . . . Van Vlasselaer, J. (2022). Ten lessons on the resilience of the EU common fisheries policy towards climate change and fuel efficiency - A call for adaptive, flexible and well-informed fisheries management. Frontiers in Marine Science, 9, 947150. <https://doi.org/10.3389/fmars.2022.947150>
- Bastardie, F., Salvany, L., Cooper, A. M., & Carvalho, N. (2024). A roadmap to reduce the risk of overexploiting EU marine living resources in a changing ocean. Frontiers in Marine Science, 11, 1352500.
- Basurko, O.C., Gabiña, G., Uriondo, Z., (2013). Energy performance of fishing vessels and potential savings. Journal of Cleaner Production, 54, 30-40.



- Basurko, O.C., Aranda, M., Caballero, A., Andres, M., Murua, J., Gabiña, G., (2023). Workshop on the European Green Deal – Challenges and opportunities for EU fisheries and aquaculture: Part I: Decarbonisation & circular economy aspects for fisheries. European Parliament, Policy Department for Structural and Cohesion Policies, Brussels.
- Belschner, T., Ferretti, J., Strehlow, H.V., Kraak, S.B.M., Döring, R., Kraus, G., Kempf, A., Zimmermann, C. (2018) Evaluating fisheries systems: A comprehensive analytical framework and its application to the EU's Common Fisheries Policy. *Fish and Fisheries* 20(1): 97-109. <https://doi.org/10.1111/faf.12325>
- Berg, C. W., Wieland, K., & Rindorf, A. (2024). Effect of tow duration, door spread, and swept area on the catch efficiency of a bottom trawl. *Fisheries Research*, 278, 107108.
- Bergström U, Berkström C, Sköld M, Börjesson P, Eggertsen M, Fetterplace L, Florin AB, Frederiksson R, Frederiksson S, Kraufvelin P, Lundström K, Nilsson J, Ovegård M, Hammar Perry D, Sacre E, Sundelöf A, Wikström A, Wennhage A (2022). Long-term effects of no-take zones in Swedish waters. *Aqua Reports*: 20.
- Center, M.K., (2017). Methanol as an alternative fuel for vessels. [https://sustainableworldports.org/wp-content/uploads/MKC-TNO-and-TU-Delft\\_2018\\_Methanol-as-an-alternative-fuel-for-vessels-report.pdf](https://sustainableworldports.org/wp-content/uploads/MKC-TNO-and-TU-Delft_2018_Methanol-as-an-alternative-fuel-for-vessels-report.pdf)
- Chassot, E., Antoine, S., Guillotreau, P., Lucas, J., Assan, C., Marguerite, M., Bodin, N., (2021). Fuel consumption and air emissions in one of the world's largest commercial fisheries. *Environmental Pollution*, 273, 116454.
- Chang, Y.C., Tseng, R.S., Chu, P.C., Shao, H.J., 2016. Global Energy-saving Map of Strong Ocean Currents. *Journal of Navigation* 69, 75-92.
- Corvus-Energy. (2024). Corvus Pelican Fuel Cell System Specifications. <https://corvusenergy.com/products/fuel-cell-systems/corvus-pelican-fuel-cell-system/>
- Churchill, R. (2022). Fisheries Management in European Union and United Kingdom Waters after Brexit: A Change for the Better? *Ocean Yearbook Online* 36(1): 287-313.
- Damalas, Dimitrios & Maravelias, Christos & Kavadas, Stefanos. (2014). Advances in Fishing Power: A Study Spanning 50 Years. *Reviews in Fisheries Science & Aquaculture*. 22. <https://doi.org/10.1080/10641262.2013.839620>.
- Damian, S. E., Wong, L. A., Shareef, H., Ramachandramurthy, V. K., Chan, C., Moh, T., & Tiong, M. C. (2022). Review on the challenges of hybrid propulsion system in marine transport system. *Journal of Energy Storage*, 56, 105983. <https://doi.org/10.1016/j.est.2022.105983>
- Davies, M., Macfadyen, G., Brugere, C., Chiarelli, N., Dale, F., and Caillart, B., (2025). Foresight Study on Fishers of the Future, Publications Office of the European Union, 2025, <https://doi.org/10.2926/3984926>



- Directorate-General for Maritime Affairs and Fisheries (DG MARE). (2012). The Evaluation of the Data Collection Framework (DCF). Lot 2: Retrospective and Prospective Evaluation on the Common Fisheries Policy, Excluding Its International Dimension. Project No: ZF1455\_501. Submitted to DG MARE 19/12/2012.
- Directorate-General for Maritime Affairs and Fisheries (DG MARE). (2024). Fleet Register. Fleet statistics about EU fishing vessels. [https://webgate.ec.europa.eu/fleet-europa/stat\\_glimpse\\_en](https://webgate.ec.europa.eu/fleet-europa/stat_glimpse_en)
- DNV, (2019). Maritime Assessment of Selected Alternative Fuels and Technologies. <https://www.dnv.com/maritime/publications/alternative-fuel-assessment-download/>
- Döring R. (2023). Relative Stabilität in Zeiten des Wandels - Warum es lohnt, über die Fangquotenverteilung in Europa nachzudenken! (Relative stability in times of change – why it would be beneficial to think about the quota distribution in Europe) Z Fischerei 3(Artikel 2):1-11
- Eigaard OR, Rihan D, Graham N, Sala A, Zachariassen K. (2011). Improving fishing effort descriptors: modelling engine power and gear-size relations of five European trawl fleets. Fisheries Research, 110: 39–46
- Eigaard, O., Marchal, P., Gislason, H., Rijnsdorp, A.D. (2014). Technological Development and Fisheries Management. Reviews in Fisheries Science & Aquaculture, 22(2), 156–174. <https://doi.org/10.1080/23308249.2014.899557>
- Eigaard, O. R., Bastardie, F., Breen, M., Dinesen, G. E., Hintzen, N. T., Laffargue, P., Mortensen, L. O., Nielsen, J. R., Nilsson, H. C., G., F., Polet, H., Reid, D. G., Sala, A., Sköld, M., Smith, C., Sørensen, T. K., Tully, O., Zengin, M., & Rijnsdorp, A. D. (2015). Estimating seabed pressure from demersal trawls, seines, and dredges based on gear design and dimensions. ICES Journal of Marine Science, 73(suppl\_1), i27-i43.
- Eigaard, O. R., Bastardie, F., et al. (2016). Estimating seabed pressure from demersal trawls, seines, and dredges based on gear design and dimensions. ICES Journal of Marine Science, 73(suppl\_1), i27-i43. <https://doi.org/10.1093/icesjms/fsv099>
- ERGOSPACE (2007). Research on the interaction between working spaces, ergonomics and prevention of occupational accidents on board fishing vessels. Setting up new solutions to the effect of reducing the severity and number of such accidents. November 2007. 13 pp.
- European Commission (2007). Communication from the Commission to the Council and the European Parliament on improving fishing capacity and effort indicators under the common fisheries policy. COM(2007) 39 final, Brussels, 5.2.2007
- European Commission (2009a). Commission of the European Communities. Green Paper: Reform of the Common Fisheries Policy. COM(2009) 163 final, Brussels, 22.4.2009.

- European Commission (2009b). Annual Report from the Commission to the European Parliament and the Council on Member States' efforts during 2007 to achieve a sustainable balance between fishing capacity and fishing opportunities. COM(2008) 902 final, Brussels, 12.1.2009.
- European Commission (2011a). Impact Assessment. Commission proposal for a Regulation of the European Parliament and of the Council on the Common Fisheries Policy [repealing Regulation (EC) No2371/2002], SEC(2011) 891 final, Brussels. 83pp.
- European Commission (2011b). Proposal for a Regulation of the European Parliament and of the Council on the Common Fisheries Policy. COM(2011) 0425 final - 2011/0195 (COD), Brussels, 13.07.2011.
- European Commission (2014). Communication from the Commission to the European Parliament and the Council Guidelines for the analysis of the balance between fishing capacity and fishing opportunities according to Art 22 of Regulation (EU) No 1380/2013 of the European Parliament and the Council on the Common Fisheries Policy COM(2014) 545 final, Brussels, 2.9.2014.
- European Commission (2016). European Commission — Directorate General of Employment, Social Affairs and Equal Opportunities. European guide for risk prevention in small fishing vessels. <https://data.europa.eu/doi/10.2767/404084>
- European Commission (2019a). Directorate-General for Maritime Affairs and Fisheries, Coffey and FS, Evaluation study on the entry-exit scheme of the European fishing fleet (SC 6) – Final report, Publications Office, 2019, <https://data.europa.eu/doi/10.2771/883602>
- European Commission (2019b). Directorate-General for Maritime Affairs and Fisheries, Study on engine power verification by Member States – Final report, Publications Office, 2019, <https://data.europa.eu/doi/10.2771/945320>
- European Commission (2019c). Executive Agency for Small and Medium-sized Enterprises, AZTI, MRAG and NEF, Study on ownership and exclusive rights of fisheries means of production – Final report, Publications Office, 2019, <https://data.europa.eu/doi/10.2826/246952>
- European Commission (2020). Communication From the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. EU Biodiversity Strategy for 2030, Bringing nature back into our lives. COM(2020) 380 final, Brussels, 20.5.2020.
- European Commission (2022a). European Climate, Infrastructure and Environment Executive Agency, Bastardie, F., Feary, D., Kell, L. et al., Climate change and the common fisheries policy – Adaptation and building resilience to the effects of climate change on fisheries and reducing emissions of greenhouse gases from fishing – Final report, Publications

Office of the European Union, 2022,  
<https://data.europa.eu/doi/10.2926/155626>

European Commission (2022b). European Climate, Infrastructure and Environment Executive Agency, The implementation of ecosystem-based approaches applied to fisheries management under the CFP – Final report, Publications Office of the European Union, 2022, <https://data.europa.eu/doi/10.2926/57956>[https://webgate.ec.europa.eu/fleet-europa/stat\\_list\\_vr\\_en](https://webgate.ec.europa.eu/fleet-europa/stat_list_vr_en)

European Commission (2023a) Report from the Commission to the European Parliament and the Council. Implementation of Regulation (EU) No 1379/2013 on the common organisation of the markets in fishery and aquaculture products COM/2023/101. Brussels, 21.2.2023

European Commission (2023b). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, EU Action Plan: Protecting and Restoring Marine Ecosystems for Sustainable and Resilient Fisheries. COM/2023/102/Final. Brussels, 21.2.2023.

European Commission (2023c). Directorate-General for Maritime Affairs and Fisheries, Possibilities and examples for energy transition of fishing and aquaculture sectors, Publications Office of the European Union, 2023, <https://data.europa.eu/doi/10.2771/828897>

European Commission (2023d). Communication from the Commission to the European Parliament and the Council - The common fisheries policy today and tomorrow: a Fisheries and Oceans Pact towards sustainable, science-based, innovative and inclusive fisheries management, COM(2023) 103 final, 21.2.2023, Brussels. European Commission (2023e). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, On the Energy Transition of the EU Fisheries and Aquaculture sector. COM(2023) 100 final, 21.2.2023, Brussels.

European Commission (2024a). Communication from the Commission to the European Parliament and the Council, Sustainable fishing in the EU: state of play and orientation for 2025. SWD(2024) 139 final, 7.6.2024, Brussels.

European Commission (2024b). Guidelines for the analysis of the balance between fishing capacity and fishing opportunities for fleet segments consisting of vessels of less than 12 metres in length in the outermost regions according to Article 22 of Regulation (EU) No 1380/2013 of the European Parliament and of the Council on the Common Fisheries Policy. Communication from the Commission to the Council and the European Parliament. COM (2024) 223 final. 21.5.2024. 5 pp.

European Commission (2024c). European Climate, Infrastructure and Environment Executive Agency, Vet, J., Gardner, H., Sala Pérez, M., Matheus, D. et al., Techno-economic analysis for the energy transition of

- the EU fisheries and aquaculture sector, Publications Office of the European Union, 2024, <https://data.europa.eu/doi/10.2926/425550>
- European Commission (2024d). Communication from the Commission to the European Parliament and the Council. Sustainable fishing in the EU: state of play and orientations for 2025, Commission staff working document, SWD(2024) 1396 final, Bussels, 7.6.2024.
- European Commission (2025a). Communication from the Commission to the European Parliament and the Council. A modernised Cohesion policy: The mid-term review. COM(2025) 163 final, Strasbourg, 1.4.2025.
- European Commission (2025b). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. The European Ocean Pact. COM(2025) 281 final, Brussels, 5.6.2025.
- European Commission (2025c). European Climate, Infrastructure and Environment Executive Agency, Davie, S., Wakeford, R.C., Whitley, C., van den Berg, P. et al., Study supporting the evaluation of the landing obligation – Common fisheries policy – Final report, Publications Office of the European Union, 2025, <https://data.europa.eu/doi/10.2926/5282226>
- European Commission (2025d): Directorate-General for Maritime Affairs and Fisheries and Roos Diesel Analysis B.V, Technical guidance for the monitoring, certification and verification of engine power in EU fisheries control – Developed by the technical working group on engine power, subgroup of the expert group on fisheries control, European Commission, 2025, <https://data.europa.eu/doi/10.2771/0220138>
- European Court of Auditors (2017). EU fisheries controls: more efforts needed. ECA Special Reports, Number 08, May 2017. 78 pp.
- EUMOFA, 2025. European Market Observatory for Fisheries and Aquaculture Products. Landings. <https://eumofa.eu/landings>
- Eurostat, 2024. Fisheries - catches and landings. [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Fisheries - catches and landings](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Fisheries_-_catches_and_landings)
- Food and Agriculture Organization (FAO). (1998). "Report of the Technical Working Group on the Management of Fishing Capacity". La Jolla, California, United States, 15-18 April 1998. FAO Fisheries Report No. 586
- Food and Agriculture Organization (FAO). (2002). Report of the expert consultation on catalysing the transition away from overcapacity in marine capture fisheries. Rim, 15-18 October, 2022. FAO Fisheries Report No. 691. FIPP/R691 (En). ISSN 0429-9337
- Fisheries Innovation and Sustainability (FIS) (2023). Net Zero Vessels Concept Design Project, Stage 2. <https://fisorg.uk/wp-content/uploads/2023/08/Final-FIS-Concept-Design-Report.pdf>

- Foretich, A., Zaimes, G.G., Hawkins, T.R., Newes, E., (2021). Challenges and opportunities for alternative fuels in the maritime sector. *Maritime Transport Research* 2, 100033.
- Gabiña, G., Basurko, O.C., Notti, E., Sala, A., Aldekoa, S., Clemente, M., Uriondo, Z., (2016). Energy efficiency in fishing: Are magnetic devices useful for use in fishing vessels? *Applied Thermal Engineering* 94, 670-678.
- Gabrielii, C.H., Jafarzadeh, S., (2020). Alternative fuels and propulsion systems for fishing vessels. *SINTEF Rapport*.
- Gallizioli, G. (2014). The Social Dimensions of the Common Fisheries Policy: A review of Current Measures. *Social issues in sustainable fisheries management*: 65-78.
- Goikoetxea, N., Goienetxea, I., Fernandes-Salvador, J.A., Goñi, N., Granado, I., Quincoces, I., Ibaibarriaga, L., Ruiz, J., Murua, H., Caballero, A., 2024. Machine-learning aiding sustainable Indian Ocean tuna purse seine fishery. *Ecological Informatics* 81, 102577.
- Granado, I., Hernando, L., Uriondo, Z., Fernandes-Salvador, J.A., 2024. A fishing route optimization decision support system: The case of the tuna purse seiner. *European Journal of Operational Research* 312, 718-732.
- Gray, N., McDonagh, S., O'Shea, R., Smyth, B., & Murphy, J. D. (2021). Decarbonising ships, planes and trucks: An analysis of suitable low-carbon fuels for the maritime, aviation and haulage sectors. *Advances in Applied Energy*, 1, 100008. <https://doi.org/10.1016/j.adapen.2021.100008>
- Grimaldo, E., Pedersen, R., Sistiaga, M., 2015. Energy consumption of three different trawl configurations used in the Barents Sea demersal trawl fishery. *Fisheries Research* 165, 71-73.
- Hegland, T. J. and J. Raakjær (2008). Recovery plans and the balancing of fishing capacity and fishing possibilities: Path dependence in the common fisheries policy. *Making fisheries management work: Implementation of policies for sustainable fishing*, Springer: 131-159.
- Hermoso V, Carvalho SB, Giakoumi S, Goldsborough D, Katsanevakis S, Leontiou V, Markantonatou V, Rumes B, Vogiatzakis IN, Yates K.L. (2022). The EU Biodiversity Strategy for 2030: Opportunities and challenges on the path towards biodiversity recovery. *Environmental Science & Policy* 127: 263-271.
- Hoyle, S. D., Campbell, R.A., Ducharme-Barth, N.D., Grüss, A., Moore, B.R., Thorson, J.T., Tremblay-Boyer, L., Winker, H., Zhou, S., Maunder, M.N. (2024). Catch per unit effort modelling for stock assessment: A summary of good practices. *Fisheries Research*, 269, 106860. <https://doi.org/10.1016/j.fishres.2023.106860>
- Jafarzadeh, S., Ellingsen, H., Aanondsen, S.A., (2016). Energy efficiency of Norwegian fisheries from 2003 to 2012. *Journal of Cleaner Production*, 112, 3616-3630.

- Jafarzadeh, S., Paltrinieri, N., Utne, I.B., Ellingsen, H., (2017). LNG-fuelled fishing vessels: A systems engineering approach. *Transportation Research Part D: Transport and Environment* 50, 202-222.
- Johnson, M., Waldman, S., Rybchenko, S., Bell, M., & Ready, S. (2022). Electrifying The Fleet: More sustainable propulsion options for the small-scale fishing fleet. Zenodo. April 2022. pp. 43 <https://doi.org/10.5281/zenodo.6547083>
- Kemp, C., Energetics, K., Atshan, S., Pardee, R., (2021). Electric power systems for fishing vessels: Feasibility, fuel savings and costs. pp. 46.
- Kraak, S. B. M., Bailey, N., Cardinale, M., Darby, C., Oliveira, J. A. A., Eero, M., Graham, N., Holmes, S., Jakobsen, T., Kempf, A., Kirkegaard, E., Powell, J., Scott, R. D., Simmonds, E. J., Ulrich, C., Vanhee, W., & Vinther, M. (2012). Lessons for fisheries management from the EU cod recovery plan. *Marine Policy*, 37, 200-213. <https://doi.org/10.1016/j.marpol.2012.05.002>
- Lagares, E. C. and F. G. Ordaz (2014). Fisheries structural policy in the European Union: a critical analysis of a subsidized sector. *Ocean & coastal management* 102: 200-211.
- Latorre, R., 2001. Reducing fishing vessel fuel consumption and NOx emissions. *Ocean Engineering* 28, 723-733.
- Lee, J., Lee, C.-W., Park, S., Kim, J., Park, S., Kim, T., 2018. Development of a low-energy midwater trawl with different combinations of trawl nets and trawl doors through model experiments. *Fisheries science* 84, 323-334.
- Leira, B., (2018). LNG as fuel on fishing vessels-Assessment of economic feasibility and environmental impact. NTNU.
- Lindebo, E., H. Frost and J. Løkkegaard (2002). Common Fisheries Policy reform: a new fleet capacity policy. Copenhagen, Fødevareøkonomisk Institut. Rapport No. 141: 46.
- Lindstad, H., & Eskeland, G. S. (2015). Low carbon maritime transport: How speed, size and slenderness amounts to substantial capital energy substitution. *Transportation Research Part D: Transport and Environment*, 41, 244-256. <https://doi.org/10.1016/j.trd.2015.10.006>
- Mahévas, S., Vermard, Y., Hutton, T., Iriondo, A., Jadaud, A., Maravelias, CD., Punzón, A., Sacchi, J., Tidd, A., Tsitsika, E., Marchal, P., Goascoz, N., Mortreux, S., & Roos, D. (2011). An investigation of human vs. technology-induced variation in catchability for a selection of European fishing fleets, *ICES Journal of Marine Science*, Volume 68, Issue 10, November 2011, Pages 2252–2263, <https://doi.org/10.1093/icesjms/fsr150>
- Maritime-Cleantech, (2019). Hybrid-electric fishing vessel. <https://maritimecleantech.no/project/first-electric-fishing-vessel/>
- Martins, J., and Brito, F., (2020). Alternative fuels for internal combustion engines. *Energies* 13, 4086.



- Mata-Álvarez-Santullano, F., Souto-Iglesias, A., (2013). Fishing effort control policies and ship stability: Analysis of a string of accidents in Spain in the period 2004–2007. *Marine Policy* 40, 10-17.
- Moecke, E.H.S., Feller, R., dos Santos, H.A., de Medeiros Machado, M., Cubas, A.L.V., de Aguiar Dutra, A.R., Santos, L.L.V., Soares, S.R., (2016). Biodiesel production from waste cooking oil for use as fuel in artisanal fishing boats: Integrating environmental, economic and social aspects. *Journal of Cleaner Production* 135, 679-688.
- MRAG (2009). Final Report: Part 1 An analysis of existing Rights-Based Management instruments in Member States and on setting up best practice in the EU. European Commission, FISH/2007/03. <https://op.europa.eu/en/publication-detail/-/publication/e1163c18-714a-11e9-9f05-01aa75ed71a1/language-en>
- Norwegian-Hydrogen, (2024). Norwegian Hydrogen will deliver green hydrogen to the world's first hydrogen-powered fishing vessel. <https://norwegianhydrogen.com/news/will-deliver-green-hydrogen-to-skulebas>
- Notti, E., Figari, M., Sala, A., Martelli, M., 2019. Experimental assessment of the fouling control coating effect on the fuel consumption rate. *Ocean Engineering* 188.
- Organisation for Economic Co-operation and Development (OECD). (2009). Reducing fishing capacity. Best practices for decommissioning schemes. OECD Publishing.
- Organisation for Economic Co-operation and Development (OECD). (2011). Fisheries Policy Reform: National Experiences. OECD Publishing. <http://dx.doi.org/10.1787/9789264096813-en>
- Organisation for Economic Co-operation and Development (OECD). (2025). OECD Review of Fisheries 2025, OECD Publishing, Paris, <https://doi.org/10.1787/560cd8fc-en>
- Ocean-Fisheries, (2010). Biodiesel benefits on sea and land. <https://www.liquidbiofuels.org.nz/documents/resource/CaseStudy-ocean-fisheries-biodiesel-case-study-06-10.pdf>
- Palomares, M.L., Pauly, D., (2019). On the creeping increase of vessels' fishing power. *Ecology and Society* 24.
- Parente, J., Fonseca, P., Henriques, V., Campos, A., 2008. Strategies for improving fuel efficiency in the Portuguese trawl fishery. *Fisheries Research* 93, 117-124.
- Perez-Labajos, C. A. (2012). Analysis of inequalities between the fishing capacities of the fleets of the European Union. *Marine Policy* 36(3): 630-635.



- Reid, D. G. N. Graham, D. J. Rihan, E. Kelly, I. R. Gatt, F. Griffin, H. D. Gerritsen, R. J. Kynoch, (2011). Do big boats tow big nets? ICES Journal of Marine Science, Volume 68, Issue 8, September 2011, Pages 1663–1669,
- Romano, A., and Yang, Z., (2021). Decarbonisation of shipping: A state of the art survey for 2000–2020. Ocean & Coastal Management, 214, 105936.
- Sakthivel, R., Ramesh, K., Purnachandran, R., Shameer, P.M., (2018). A review on the properties, performance and emission aspects of the third generation biodiesels. Renewable and Sustainable Energy Reviews 82, 2970-2992.
- Sala A., De Carlo F., Buglioni G., Lucchetti A. (2011). Energy Performance Evaluation of Fishing Vessels by Fuel Mass Flow Measuring System. Ocean. Eng. 38, 804–809. <https://doi.org/10.1016/j.oceaneng.2011.02.004>
- Sala, A., Damalas, D., Labanchi, L., Martinsohn, J., Moro, F., Sabatella, R., and Notti, E., (2022). Energy audit and carbon footprint in trawl fisheries. Scientific Data, 9(1), 428. <https://doi.org/10.1038/s41597-022-01478-0>.
- Schreiber, A., Kinds, M., Villasante, S., (2024), Research for PECH Committee – Training and social security schemes for fishers – State of play and perspectives in the EU, European Parliament, Policy Department for Structural and Cohesion Policies, Brussels
- Schmuedderich, S, Madriles Helm, A, Sanmamed, A, Caillart, B, Salz, P, (2024). Research for PECH Committee – Workshop on the future of the EU fishing fleet – First assessment of Member States' EMFAF programmes for 2021-27, European Parliament, Policy Department for Structural and Cohesion Policies, Brussels.
- Scientific, Technical and Economic Committee for Fisheries (STECF). (2019). Social data in the EU fisheries sector (STECF-19-03). Publications Office of the European Union, Luxembourg, 2018, ISBN 978-92-76-09514-9, <https://doi.org/10.2760/638363>, JRC117517
- Scientific, Technical and Economic Committee for Fisheries (STECF). (2023). The 2023 Annual Economic Report on the EU Fishing Fleet (STECF 23-07), Prellezo, R., Sabatella, E., Virtanen, J., Tardy Martorell, M. and Guillen, J. editor(s), Publications Office of the European Union, Luxembourg, 2023, <https://doi.org/10.2760/423534>, JRC135182.
- Scientific, Technical and Economic Committee for Fisheries (STECF). (2024a). Assessment of balance indicators for key fleet segments and review of national reports on Member States efforts to achieve balance between fleet capacity and fishing opportunities (STECF-23-13), Casey, J. and Virtanen, J. editor(s), Publications Office of the European Union, Luxembourg, 2024, <https://data.europa.eu/doi/10.2760/958072>, JRC136331.
- Scientific, Technical and Economic Committee for Fisheries (STECF). (2024b). Monitoring the Performance of the Common Fisheries Policy (STECF-Adhoc-24-01), Gras, M., Pierucci, A., Mantopoulou Palouka, D., Kupschus, S. and Konrad, C. editor(s), Publications Office of the European Union,

- Luxembourg, 2024, <https://data.europa.eu/doi/10.2760/547228>, JRC137731.
- Scientific Technical and Economic Committee for Fisheries (STECF). (2024c). The 2024 Annual Economic Report on the EU Fishing Fleet (STECF-24-03 & STECF-24-07), Prelezo, R., Sabatella, E.C., Virtanen, J., Tardy Martorell, M., and Guillen, J. editor(s), Publications Office of the European Union, Luxembourg, 2024, <https://data.europa.eu/doi/10.2760/5037826>, JRC139642.
- Scientific Technical and Economic Committee for Fisheries (STECF). (2024d). Assessment of balance indicators for key fleet segments and review of national reports on Member States efforts to achieve balance between fleet capacity and fishing opportunities (STECF-24-13), Casey, J., Gras, M and Virtanen, J. editor(s), Publications Office of the European Union, Luxembourg, 2024.
- Scientific, Technical and Economic Committee for Fisheries (STECF). (2024e). Fishing effort regime for demersal fisheries in West Med (STECF 24-12), Pinto, C., Doering, R. and Kupschus, S. editor(s), Publications Office of the European Union, Luxembourg, 2025, <https://data.europa.eu/doi/10.2760/8731052>, JRC140774
- Scientific, Technical and Economic Committee for Fisheries (STECF). (2025). Monitoring the performance of the Common Fisheries Policy (STECF-Adhoc-25-01). Publications Office of the European Union, Luxembourg, 2025.
- Stewart, B.D., Williams, C., Barnes, R., Walmsley, S.F., Carpenter, G. (2022). The Brexit deal and UK fisheries - has reality matched the rhetoric? Maritime Studies 21: 1-17. <https://doi.org/10.1007/s40152-022-00259-0>
- Science and Technology Options Assessment (STOA). (2024). Exploring the viability of innovative fishing technologies as an alternative to bottom trawling in European marine protected areas: An environmental and socioeconomic analysis 2024. Author: Bastardie F. for STOA Panel for the Future of Science and Technology. The European Parliament, Brussels, 94 pp.
- Szelangiewicz, T., Abramowski, T., Żelazny, K., Sugalski, K., (2021). Reduction of resistance, fuel consumption and GHG emission of a small fishing vessel by adding a bulbous bow. Energies, 14, 1837.
- Thermes, S., Van Anrooy, R., Gudmundsson, A., Davy, D., (2023). Classification and definition of fishing vessel types.
- Tsitsika, E.V., Maravelias, C.D., Wattage, P., Haralabous, J., 2008. Fishing capacity and capacity utilization of purse seiners using data envelopment analysis. Fisheries Science 74, 730-735.
- Uhlmann, S. S., Ulrich, C., & Kennelly, S. J. (Eds.) (2019). The European Landing Obligation: Reducing Discards in Complex, Multi-Species and Multi-

Jurisdictional Fisheries. Springer Open. <https://doi.org/10.1007/978-3-030-03308-8>

van der Reijden, K. J. Eigaard, O. R., Bastardie, F. O'Neill F. G. (2025). Gear component parametrization approach refines assessments of seafloor abrasion and allows quantification of sediment mobilized by bottom trawling. (Submitted).

Weissenberger, J. (2013). A new framework for the Common Fisheries Policy. Library Briefing. Library of the European Parliament. 31/01/2013. 1 pp.

Zhu, J., Xu, Q. (2024). Reflections on the settlement of fisheries disputes between the EU-UK in the post-Brexit era: Lessons for China's fishery enforcement disputes settlement. *Marine Policy* 169: 106365. <https://doi.org/10.1016/j.marpol.2024.106365>

## EU Legislation

Regulation (EEC) No 2141/70 of the Council of 20 October 1970 laying down a common structural policy for the fishing industry. *Official Journal L* 236, 27.10.1970, Series I Volume 1970(III), p 703-796. <http://data.europa.eu/eli/reg/1970/2141/oj>

Council Regulation (EEC) No 101/76 of 19 January 1976 laying down a common structural policy for the fishing industry. *Official Journal L* 20, 28.01.1976, p. 19-22. <http://data.europa.eu/eli/reg/1976/101/oj>

Council Regulation (EEC) No 170/83 of 25 January 1983 establishing a Community system for the conservation and management of fishery resources. *Official Journal L* 24, 27.1.1983, p. 1-13. <http://data.europa.eu/eli/reg/1983/170/oj>

Council Regulation (EEC) No 171/83 of 25 January 1983 laying down certain technical measures for the conservation of fishery resources. *Official Journal L* 24, 27.1.1983, p. 14-29. <http://data.europa.eu/eli/reg/1983/171/oj>

Council Regulation (EEC) No 2930/86 of 22 September 1986 defining characteristics for fishing vessels. *Official Journal L* 274, 25/09/1986 p.1-2. <http://data.europa.eu/eli/reg/1986/2930/oj>

Council Regulation (EEC) No 2080/93 of 20 July 1993 laying Down Provisions for Implementing Regulation (EEC) No 2052/88 as Regards the Financial Instrument of Fisheries Guidance. *Official Journal L* 193, 31.7.1993, p. 1-4. <http://data.europa.eu/eli/reg/1993/2080/oj>

Council Regulation (EC) No 1263/1999 of 21 June 1999 on the Financial Instrument for Fisheries Guidance. *Original Journal L* 161, 26.6.1999, p. 54-56. <http://data.europa.eu/eli/reg/1999/1263/oj>

Council Regulation (EC) No 1543/2000 of 29 June 2000 establishing a Community framework for the collection and management of the data needed to conduct the common fisheries policy. *Original Journal L* 176, 15.7.2000, p. 1-16. <http://data.europa.eu/eli/reg/2000/1543/oj>

- Council Regulation (EC) No 2347/2002 of 16 December 2002 establishing specific access requirements and associated conditions applicable to fishing for deep-sea stocks. *Official Journal L* 351, 28.12.2002, p. 6-11. <http://data.europa.eu/eli/reg/2002/2347/oj>
- Council Regulation (EC) No 2371/2002 of 20 December 2002 on the Conservation and Sustainable Exploitation of Fisheries Resources under the Common Fisheries Policy. *Official Journal L* 358, 31.12.2002, p. 59-80. <http://data.europa.eu/eli/reg/2002/2371/oj>
- Council Regulation (EC) No 1198/2006 of 27 July 2006 on the European Fisheries Fund. *Original Journal L* 223, 15.8.2006, p. 1-44. <http://data.europa.eu/eli/reg/2006/1198/oj>
- Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy, amending Council Regulations (EC) No 1954/2003 and (EC) No 1224/2009 and repealing Council Regulations (EC) No 2371/2002 and (EC) No 639/2004 and Council Decision 2004/585/EC. *Official Journal L* 354, 28.12.2013, p. 22-61. <http://data.europa.eu/eli/reg/2013/1380/oj>
- Regulation (EU) No 508/2014 of the European Parliament and the Council of 15 May 2014 on the European Maritime and Fisheries Fund and repealing Council Regulations (EC) No 2328/2003, (EC) No 861/2006, (EC) No 1198/2006 and (EC) No 791/2007 and Regulation (EU) No 1255/2011 of the European Parliament and of the Council. *Official Journal L* 149, 20.5.2014, p. 1-66. <http://data.europa.eu/eli/reg/2014/508/oj>
- Regulation (EU) 2016/2336 of the European Parliament and of the Council of 14 December 2016 establishing specific conditions for fishing for deep-sea stocks in the north-east Atlantic and provisions for fishing in international waters of the north-east Atlantic and repealing Council Regulation (EC) No 2347/2002. *Official Journal L* 354, 23.12.2016, p. 1-19. <http://data.europa.eu/eli/reg/2016/2336/oj>
- Regulation (EC) No 2017/1004 of the European Parliament and of the Council of 17 May 2017 on the establishment of a Union framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the common fisheries policy and repealing Council Regulation (EC) No 199/2008 (recast). *Original Journal L* 157, 20.6.2017, p. 1-21. <http://data.europa.eu/eli/reg/2017/1004/oj>
- Regulation (EU) 2017/1130 of the European Parliament and of the Council of 14 June 2017 defining characteristics for fishing vessels (recast). *Official Journal L* 169, 30.6.2017, p. 1-7. <http://data.europa.eu/eli/reg/2017/1130/oj>
- Council Regulation (EU, Euratom) 2020/2093 of 17 December 2020 laying down the multiannual financial framework for the years 2021 to 2027. *Official Journal L* 433I, 22.12.2020, p. 11-22. <http://data.europa.eu/eli/reg/2020/2093/oj>

- Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law'). *Official Journal L* 243, 9.7.2021, p. 1–17. <http://data.europa.eu/eli/reg/2021/1119/oj>
- Regulation (EU) 2021/1139 of the European Parliament and of the Council of 7 July 2021 establishing the European Maritime, Fisheries and Aquaculture Fund and amending Regulation (EU) 2017/1004. *Official Journal L* 247, 13.7.2021, p. 1-49. <http://data.europa.eu/eli/reg/2021/1139/oj>
- Regulation (EU) 2023/1805 of the European Parliament and of the Council of 13 September 2023 on the use of renewable and low-carbon fuels in maritime transport and amending Directive 2009/16/EC (Text with EEA relevance). *Official Journal L* 234, 22.9.2023, p. 48–100. <http://data.europa.eu/eli/reg/2023/1805/oj>
- Regulation (EU) 2024/1991 of the European Parliament and of the Council of 24 June 2024 on nature restoration and amending Regulation (EU) 2022/869 (Text with EEA relevance). PE/74/2023/REV/1. *Official Journal L* 2024/1991, 29.7.2024, <http://data.europa.eu/eli/reg/2024/1991/oj>

## Annex 1: 2023 EU Fleet Capacity Status

**Table 31 – Deduced from the EU fleet register for all vessels present in the register on the 1st of January 2024**

| Year | Country | Vessel category | Mean LOA | Mean Age | Sum kW | Mean kW | Sum GT | Mean GT | No Vessels |
|------|---------|-----------------|----------|----------|--------|---------|--------|---------|------------|
| 2023 | BEL     | VL1518          | 17.0     | 56.0     | 221    | 221     | 42     | 42      | 1          |
| 2023 | BEL     | VL1824          | 22.5     | 35.8     | 5 502  | 220     | 2 194  | 88      | 25         |
| 2023 | BEL     | VL2440          | 35.7     | 26.1     | 38 589 | 1 135   | 11 461 | 337     | 34         |
| 2023 | BGR     | VL0006          | 4.9      | 22.0     | 7 967  | 10      | 612    | 1       | 766        |
| 2023 | BGR     | VL0608          | 6.8      | 28.7     | 18 175 | 24      | 1 214  | 2       | 772        |
| 2023 | BGR     | VL0810          | 8.8      | 25.6     | 4 396  | 48      | 372    | 4       | 92         |
| 2023 | BGR     | VL1012          | 11.0     | 25.9     | 4 702  | 76      | 508    | 8       | 62         |
| 2023 | BGR     | VL1215          | 13.8     | 24.6     | 4 440  | 139     | 541    | 17      | 32         |
| 2023 | BGR     | VL1518          | 16.5     | 24.1     | 5 119  | 197     | 655    | 25      | 26         |
| 2023 | BGR     | VL1824          | 21.3     | 43.1     | 4 123  | 258     | 752    | 47      | 16         |
| 2023 | BGR     | VL2440          | 25.6     | 37.9     | 3 289  | 299     | 1 193  | 108     | 11         |
| 2023 | CYP     | VL0006          | 5.0      | NaN      | 11 070 | 29      | 427    | 1       | 385        |
| 2023 | CYP     | VL0608          | 7.2      | NaN      | 4 635  | 31      | 334    | 2       | 148        |
| 2023 | CYP     | VL0810          | 8.9      | NaN      | 10 585 | 55      | 749    | 4       | 193        |
| 2023 | CYP     | VL1012          | 10.6     | NaN      | 4 553  | 95      | 333    | 7       | 48         |
| 2023 | CYP     | VL1215          | 13.3     | NaN      | 2 853  | 136     | 391    | 19      | 21         |
| 2023 | CYP     | VL1518          | 16.6     | NaN      | 2 286  | 208     | 479    | 44      | 11         |
| 2023 | CYP     | VL1824          | 20.6     | NaN      | 1 905  | 318     | 516    | 86      | 6          |
| 2023 | CYP     | VL2440          | 26.1     | NaN      | 2 088  | 348     | 665    | 111     | 6          |
| 2023 | DEU     | VL0006          | 5.0      | 30.8     | 6 942  | 14      | 494    | 1       | 490        |
| 2023 | DEU     | VL0608          | 7.0      | 40.0     | 5 982  | 24      | 490    | 2       | 246        |
| 2023 | DEU     | VL0810          | 9.0      | 38.5     | 6 545  | 56      | 600    | 5       | 117        |
| 2023 | DEU     | VL1012          | 11.0     | 42.1     | 5 709  | 98      | 726    | 13      | 58         |
| 2023 | DEU     | VL1215          | 14.1     | 56.2     | 4 226  | 163     | 580    | 22      | 26         |
| 2023 | DEU     | VL1518          | 16.5     | 47.0     | 17 846 | 205     | 3 061  | 35      | 87         |
| 2023 | DEU     | VL1824          | 20.3     | 41.5     | 16 890 | 222     | 5 003  | 66      | 76         |
| 2023 | DEU     | VL2440          | 32.7     | 36.8     | 18 074 | 723     | 6 905  | 276     | 25         |
| 2023 | DEU     | VL40XX          | 68.1     | 22.7     | 44 556 | 2 785   | 39 190 | 2 449   | 16         |
| 2023 | DNK     | VL0006          | 5.0      | 33.7     | 12 330 | 19      | 478    | 1       | 664        |
| 2023 | DNK     | VL0608          | 7.0      | 40.1     | 15 346 | 33      | 1 172  | 2       | 472        |
| 2023 | DNK     | VL0810          | 9.1      | 42.5     | 18 745 | 70      | 1 644  | 6       | 269        |
| 2023 | DNK     | VL1012          | 11.3     | 46.3     | 9 706  | 114     | 1 049  | 12      | 85         |
| 2023 | DNK     | VL1215          | 14.0     | 46.9     | 13 182 | 167     | 1 831  | 23      | 79         |
| 2023 | DNK     | VL1518          | 16.4     | 32.9     | 23 472 | 213     | 5 940  | 54      | 110        |
| 2023 | DNK     | VL1824          | 21.4     | 29.5     | 18 122 | 342     | 6315   | 119     | 53         |
| 2023 | DNK     | VL2440          | 30.5     | 18.2     | 20 139 | 775     | 8 927  | 343     | 26         |
| 2023 | DNK     | VL40XX          | 58.6     | 20.0     | 69 101 | 3 141   | 37 866 | 1 721   | 22         |



| Year | Country | Vessel category | Mean LOA | Mean Age | Sum kW  | Mean kW | Sum GT  | Mean GT | No Vessels |
|------|---------|-----------------|----------|----------|---------|---------|---------|---------|------------|
| 2023 | ESP     | VL0006          | 5.3      | 50.2     | 41 751  | 16      | 2 713   | 1       | 2 625      |
| 2023 | ESP     | VL0608          | 6.8      | 36.5     | 38 213  | 20      | 3 475   | 2       | 1 909      |
| 2023 | ESP     | VL0810          | 9.0      | 31.8     | 39 249  | 34      | 4 320   | 4       | 1 153      |
| 2023 | ESP     | VL1012          | 11.1     | 29.7     | 31 822  | 52      | 4 293   | 7       | 608        |
| 2023 | ESP     | VL1215          | 13.5     | 29.4     | 45 905  | 72      | 8 628   | 14      | 634        |
| 2023 | ESP     | VL1518          | 16.6     | 28.0     | 38 994  | 112     | 10 697  | 31      | 347        |
| 2023 | ESP     | VL1824          | 21.1     | 25.5     | 119 244 | 192     | 38 490  | 62      | 621        |
| 2023 | ESP     | VL2440          | 29.2     | 24.5     | 220 839 | 399     | 108 267 | 195     | 554        |
| 2023 | ESP     | VL40XX          | 61.4     | 24.6     | 178 322 | 1 838   | 133 789 | 1 379   | 97         |
| 2023 | EST     | VL0006          | 4.6      | 23.6     | 10 880  | 7       | 910     | 1       | 1 568      |
| 2023 | EST     | VL0608          | 6.9      | 34.5     | 2 938   | 18      | 305     | 2       | 166        |
| 2023 | EST     | VL0810          | 8.8      | 33.9     | 4 855   | 23      | 695     | 3       | 210        |
| 2023 | EST     | VL1012          | 11.6     | 33.4     | 2 945   | 52      | 390     | 7       | 57         |
| 2023 | EST     | VL1215          | 12.1     | 28.5     | 232     | 58      | 31      | 8       | 4          |
| 2023 | EST     | VL1824          | 22.6     | 33.6     | 1 694   | 339     | 629     | 126     | 5          |
| 2023 | EST     | VL2440          | 27.3     | 38.8     | 8 614   | 431     | 3 412   | 171     | 20         |
| 2023 | EST     | VL40XX          | 64.9     | 29.4     | 17 106  | 3 421   | 9 834   | 1 967   | 5          |
| 2023 | FIN     | VL0006          | 5.0      | 29.4     | 42 961  | 24      | 1 679   | 1       | 1 826      |
| 2023 | FIN     | VL0608          | 6.9      | 30.1     | 43 222  | 53      | 1 932   | 2       | 821        |
| 2023 | FIN     | VL0810          | 9.0      | 36.9     | 37 226  | 92      | 2 214   | 5       | 404        |
| 2023 | FIN     | VL1012          | 10.9     | 38.0     | 22 218  | 172     | 1 381   | 11      | 129        |
| 2023 | FIN     | VL1215          | 13.6     | 38.9     | 4 824   | 219     | 515     | 23      | 22         |
| 2023 | FIN     | VL1518          | 16.4     | 44.7     | 2 504   | 250     | 353     | 35      | 10         |
| 2023 | FIN     | VL1824          | 21.6     | 46.2     | 3 251   | 464     | 626     | 89      | 7          |
| 2023 | FIN     | VL2440          | 33.6     | 42.7     | 14 394  | 900     | 5 068   | 317     | 16         |
| 2023 | FIN     | VL40XX          | 40.6     | 45.4     | 3 269   | 1 090   | 1 327   | 442     | 3          |
| 2023 | FRA     | VL0006          | 5.5      | 36.3     | 23 809  | 35      | 703     | 1       | 678        |
| 2023 | FRA     | VL0608          | 7.1      | 29.0     | 199 783 | 89      | 4 832   | 2       | 2 252      |
| 2023 | FRA     | VL0810          | 9.0      | 28.0     | 210 101 | 149     | 6 739   | 5       | 1 408      |
| 2023 | FRA     | VL1012          | 11.4     | 31.3     | 134 958 | 154     | 11 191  | 13      | 876        |
| 2023 | FRA     | VL1215          | 13.9     | 31.7     | 41 938  | 214     | 6 365   | 32      | 196        |
| 2023 | FRA     | VL1518          | 16.2     | 33.2     | 61 968  | 277     | 14 188  | 63      | 224        |
| 2023 | FRA     | VL1824          | 21.3     | 29.6     | 70 920  | 388     | 22 339  | 122     | 183        |
| 2023 | FRA     | VL2440          | 28.9     | 25.7     | 83 144  | 594     | 33 509  | 239     | 140        |
| 2023 | FRA     | VL40XX          | 65.6     | 22.9     | 93 432  | 2 669   | 57 763  | 1 650   | 35         |
| 2023 | GRC     | VL0006          | 5.0      | 37.1     | 36 278  | 10      | 2 584   | 1       | 3 599      |
| 2023 | GRC     | VL0608          | 7.0      | 36.1     | 66 973  | 17      | 7 072   | 2       | 4 023      |
| 2023 | GRC     | VL0810          | 8.8      | 28.0     | 83 675  | 30      | 10 442  | 4       | 2 791      |
| 2023 | GRC     | VL1012          | 11.0     | 38.5     | 22 164  | 67      | 2 700   | 8       | 332        |
| 2023 | GRC     | VL1215          | 13.4     | 34.3     | 21 842  | 93      | 3 659   | 16      | 234        |
| 2023 | GRC     | VL1518          | 16.4     | 37.4     | 13 817  | 132     | 2 449   | 23      | 105        |
| 2023 | GRC     | VL1824          | 21.2     | 36.3     | 49 313  | 227     | 10 715  | 49      | 217        |
| 2023 | GRC     | VL2440          | 27.9     | 29.0     | 49 328  | 303     | 20 307  | 125     | 163        |



| Year | Country | Vessel category | Mean LOA | Mean Age | Sum kW  | Mean kW | Sum GT | Mean GT | No Vessels |
|------|---------|-----------------|----------|----------|---------|---------|--------|---------|------------|
| 2023 | HRV     | VL0006          | 4.8      | 41.8     | 42 427  | 10      | 3 968  | 1       | 4 289      |
| 2023 | HRV     | VL0608          | 6.9      | 42.9     | 65 040  | 39      | 3 834  | 2       | 1 653      |
| 2023 | HRV     | VL0810          | 9.0      | 39.4     | 51 027  | 96      | 2 597  | 5       | 532        |
| 2023 | HRV     | VL1012          | 11.2     | 43.3     | 46 355  | 137     | 3 110  | 9       | 339        |
| 2023 | HRV     | VL1215          | 13.5     | 44.4     | 34 278  | 157     | 3 092  | 14      | 218        |
| 2023 | HRV     | VL1518          | 16.8     | 63.8     | 15 121  | 178     | 2 535  | 30      | 85         |
| 2023 | HRV     | VL1824          | 20.7     | 58.4     | 29 884  | 296     | 7 135  | 71      | 101        |
| 2023 | HRV     | VL2440          | 28.4     | 40.5     | 54 267  | 532     | 15 746 | 154     | 102        |
| 2023 | IRL     | VL0006          | 5.4      | 28.6     | 5 537   | 9       | 631    | 1       | 650        |
| 2023 | IRL     | VL0608          | 6.9      | 32.3     | 10 941  | 21      | 1 105  | 2       | 523        |
| 2023 | IRL     | VL0810          | 9.2      | 35.9     | 20 977  | 54      | 2 113  | 5       | 385        |
| 2023 | IRL     | VL1012          | 11.2     | 37.0     | 18 588  | 80      | 2 536  | 11      | 231        |
| 2023 | IRL     | VL1215          | 13.4     | 35.7     | 7 493   | 107     | 1 633  | 23      | 70         |
| 2023 | IRL     | VL1518          | 16.9     | 41.1     | 3 446   | 215     | 1 100  | 69      | 16         |
| 2023 | IRL     | VL1824          | 22.1     | 32.9     | 23 294  | 376     | 8 691  | 140     | 62         |
| 2023 | IRL     | VL2440          | 28.3     | 29.7     | 39 692  | 515     | 16 840 | 219     | 77         |
| 2023 | IRL     | VL40XX          | 56.1     | 16.7     | 49 988  | 2 083   | 29 464 | 1 228   | 24         |
| 2023 | ITA     | VL0006          | 5.2      | 45.8     | 16 752  | 7       | 2 580  | 1       | 2 573      |
| 2023 | ITA     | VL0608          | 6.9      | 40.0     | 78 894  | 20      | 4 998  | 1       | 3 855      |
| 2023 | ITA     | VL0810          | 8.9      | 36.6     | 78 980  | 55      | 4 357  | 3       | 1 447      |
| 2023 | ITA     | VL1012          | 11.1     | 37.5     | 87 710  | 91      | 6 364  | 7       | 969        |
| 2023 | ITA     | VL1215          | 13.6     | 33.9     | 254 595 | 130     | 27 005 | 14      | 1 961      |
| 2023 | ITA     | VL1518          | 16.5     | 36.4     | 75 639  | 178     | 12 955 | 31      | 424        |
| 2023 | ITA     | VL1824          | 20.7     | 37.1     | 204 947 | 284     | 43 114 | 60      | 722        |
| 2023 | ITA     | VL2440          | 27.2     | 33.3     | 129 016 | 450     | 36 429 | 127     | 287        |
| 2023 | ITA     | VL40XX          | 46.3     | 32.4     | 19 726  | 1 038   | 8 095  | 426     | 19         |
| 2023 | LTU     | VL0006          | 5.2      | 30.3     | 1 914   | 26      | 79     | 1       | 75         |
| 2023 | LTU     | VL0608          | 7.2      | 30.2     | 298     | 33      | 19     | 2       | 9          |
| 2023 | LTU     | VL0810          | 8.9      | 41.6     | 154     | 31      | 28     | 6       | 5          |
| 2023 | LTU     | VL1012          | 11.1     | 41.7     | 506     | 56      | 93     | 10      | 9          |
| 2023 | LTU     | VL1215          | 14.6     | 46.0     | 110     | 110     | 22     | 22      | 1          |
| 2023 | LTU     | VL1824          | 22.0     | 45.0     | 539     | 269     | 195    | 98      | 2          |
| 2023 | LTU     | VL2440          | 29.3     | 46.7     | 3 396   | 377     | 1 597  | 177     | 9          |
| 2023 | LTU     | VL40XX          | 85.0     | 38.9     | 30 562  | 4 366   | 30 502 | 4 357   | 7          |
| 2023 | LVA     | VL0006          | 4.6      | 36.1     | 2 451   | 5       | 324    | 1       | 508        |
| 2023 | LVA     | VL0608          | 7.0      | 36.9     | 930     | 18      | 132    | 3       | 52         |
| 2023 | LVA     | VL0810          | 9.0      | 35.3     | 1 356   | 29      | 242    | 5       | 47         |
| 2023 | LVA     | VL1012          | 11.1     | 35.0     | 568     | 95      | 64     | 11      | 6          |
| 2023 | LVA     | VL1518          | 17.6     | 41.2     | 1 597   | 200     | 232    | 29      | 8          |
| 2023 | LVA     | VL1824          | 19.9     | 45.0     | 602     | 201     | 194    | 65      | 3          |
| 2023 | LVA     | VL2440          | 26.8     | 37.4     | 11 016  | 355     | 4 518  | 146     | 31         |
| 2023 | LVA     | VL40XX          | 74.0     | 37.7     | 20 664  | 2 952   | 16 352 | 2 336   | 7          |
| 2023 | MLT     | VL0006          | 4.9      | 35.1     | 13 447  | 33      | 442    | 1       | 411        |

| Year | Country | Vessel category | Mean LOA | Mean Age | Sum kW  | Mean kW | Sum GT | Mean GT | No Vessels |
|------|---------|-----------------|----------|----------|---------|---------|--------|---------|------------|
| 2023 | MLT     | VL0608          | 7.0      | 33.7     | 20 470  | 87      | 649    | 3       | 235        |
| 2023 | MLT     | VL0810          | 9.0      | 34.9     | 7 825   | 119     | 337    | 5       | 66         |
| 2023 | MLT     | VL1012          | 11.3     | 28.4     | 9 079   | 154     | 573    | 10      | 59         |
| 2023 | MLT     | VL1215          | 14.1     | 36.5     | 2 167   | 167     | 246    | 19      | 13         |
| 2023 | MLT     | VL1518          | 16.6     | 43.9     | 1 067   | 178     | 139    | 23      | 6          |
| 2023 | MLT     | VL1824          | 21.2     | 30.1     | 10 372  | 305     | 2 550  | 75      | 34         |
| 2023 | MLT     | VL2440          | 28.8     | 30.0     | 4 622   | 578     | 1 560  | 195     | 8          |
| 2023 | NLD     | VL0006          | 4.7      | 32.8     | 2 858   | 25      | 115    | 1       | 113        |
| 2023 | NLD     | VL0608          | 7.1      | 27.3     | 7 152   | 69      | 157    | 2       | 103        |
| 2023 | NLD     | VL0810          | 9.1      | 26.5     | 11 486  | 125     | 310    | 3       | 92         |
| 2023 | NLD     | VL1012          | 11.2     | 35.3     | 5 008   | 132     | 311    | 8       | 38         |
| 2023 | NLD     | VL1215          | 14.0     | 39.0     | 4 406   | 142     | 550    | 18      | 31         |
| 2023 | NLD     | VL1518          | 17.4     | 49.8     | 1 162   | 129     | 265    | 29      | 9          |
| 2023 | NLD     | VL1824          | 21.6     | 47.5     | 37 837  | 208     | 11 924 | 66      | 182        |
| 2023 | NLD     | VL2440          | 31.6     | 51.6     | 63 655  | 486     | 22 783 | 174     | 131        |
| 2023 | NLD     | VL40XX          | 48.5     | 29.4     | 112 451 | 1 606   | 62 861 | 898     | 70         |
| 2023 | POL     | VL0006          | 4.4      | 25.9     | 637     | 6       | 88     | 1       | 112        |
| 2023 | POL     | VL0608          | 7.2      | 36.6     | 5 879   | 27      | 601    | 3       | 221        |
| 2023 | POL     | VL0810          | 8.8      | 35.3     | 8 441   | 43      | 917    | 5       | 197        |
| 2023 | POL     | VL1012          | 11.3     | 35.3     | 8 925   | 67      | 1 430  | 11      | 133        |
| 2023 | POL     | VL1215          | 14.1     | 30.6     | 4 614   | 128     | 926    | 26      | 36         |
| 2023 | POL     | VL1518          | 17.5     | 63.7     | 1 953   | 130     | 588    | 39      | 15         |
| 2023 | POL     | VL1824          | 19.7     | 57.2     | 14 222  | 226     | 3 772  | 60      | 63         |
| 2023 | POL     | VL2440          | 26.7     | 45.4     | 17 459  | 397     | 7 123  | 162     | 44         |
| 2023 | POL     | VL40XX          | 98.6     | 35.0     | 21 740  | 7 247   | 20 031 | 6 677   | 3          |
| 2023 | PRT     | VL0006          | 4.7      | 44.3     | 31 856  | 11      | 2 121  | 1       | 2 911      |
| 2023 | PRT     | VL0608          | 6.8      | 30.9     | 71 391  | 30      | 4 047  | 2       | 2 343      |
| 2023 | PRT     | VL0810          | 9.0      | 35.8     | 29 543  | 47      | 2 828  | 4       | 629        |
| 2023 | PRT     | VL1012          | 11.2     | 35.9     | 23 423  | 78      | 2 899  | 10      | 299        |
| 2023 | PRT     | VL1215          | 13.4     | 38.9     | 26 513  | 108     | 4 312  | 18      | 245        |
| 2023 | PRT     | VL1518          | 16.6     | 37.1     | 19 091  | 159     | 4 113  | 34      | 120        |
| 2023 | PRT     | VL1824          | 20.9     | 31.6     | 41 900  | 272     | 11 889 | 77      | 154        |
| 2023 | PRT     | VL2440          | 28.1     | 29.2     | 69 801  | 492     | 27 413 | 193     | 142        |
| 2023 | PRT     | VL40XX          | 66.0     | 41.2     | 29 345  | 1 834   | 25 183 | 1 574   | 16         |
| 2023 | ROU     | VL0006          | 5.1      | 22.8     | 65      | 5       | 9      | 1       | 14         |
| 2023 | ROU     | VL0608          | 6.9      | 21.4     | 610     | 6       | 112    | 1       | 96         |
| 2023 | ROU     | VL0810          | 9.0      | 27.1     | 250     | 25      | 57     | 6       | 10         |
| 2023 | ROU     | VL1012          | 10.9     | 26.1     | 986     | 35      | 200    | 7       | 28         |
| 2023 | ROU     | VL1215          | 14.9     | 12.0     | 3 036   | 145     | 710    | 34      | 21         |
| 2023 | ROU     | VL1824          | 22.1     | 34.0     | 846     | 282     | 318    | 106     | 3          |
| 2023 | ROU     | VL2440          | 26.1     | 31.5     | 555     | 278     | 228    | 114     | 2          |
| 2023 | SVN     | VL0006          | 4.9      | NaN      | 956     | 16      | 58     | 1       | 61         |
| 2023 | SVN     | VL0608          | 7.0      | NaN      | 1 725   | 48      | 92     | 3       | 36         |

| Year | Country | Vessel category | Mean LOA | Mean Age | Sum kW | Mean kW | Sum GT | Mean GT | No Vessels |
|------|---------|-----------------|----------|----------|--------|---------|--------|---------|------------|
| 2023 | SVN     | VL0810          | 9.1      | NaN      | 1 020  | 85      | 60     | 5       | 12         |
| 2023 | SVN     | VL1012          | 11.3     | NaN      | 2 379  | 198     | 109    | 9       | 12         |
| 2023 | SVN     | VL1215          | 13.1     | NaN      | 1 630  | 181     | 95     | 11      | 9          |
| 2023 | SVN     | VL1518          | 17.0     | NaN      | 1 049  | 210     | 142    | 28      | 5          |
| 2023 | SVN     | VL1824          | 19.4     | NaN      | 0      | 0       | 114    | 114     | 1          |
| 2023 | SWE     | VL0006          | 5.3      | 38.4     | 5 979  | 26      | 182    | 1       | 231        |
| 2023 | SWE     | VL0608          | 6.9      | 39.3     | 10 866 | 47      | 459    | 2       | 230        |
| 2023 | SWE     | VL0810          | 9.1      | 39.3     | 22 948 | 106     | 1 219  | 6       | 217        |
| 2023 | SWE     | VL1012          | 11.2     | 38.7     | 26 387 | 170     | 1 891  | 12      | 155        |
| 2023 | SWE     | VL1215          | 13.9     | 43.0     | 10 644 | 231     | 1 187  | 26      | 46         |
| 2023 | SWE     | VL1518          | 16.6     | 42.1     | 6 991  | 291     | 1 402  | 58      | 24         |
| 2023 | SWE     | VL1824          | 20.6     | 37.7     | 13 341 | 404     | 3 980  | 121     | 33         |
| 2023 | SWE     | VL2440          | 31.4     | 41.8     | 12 559 | 739     | 4 925  | 290     | 17         |
| 2023 | SWE     | VL40XX          | 54.4     | 8.6      | 21 103 | 3 015   | 8 935  | 1 276   | 7          |

## Annex 2: Overview of EU cases studies

- 2.1 Fisheries in the Western Mediterranean
- 2.2 Portuguese fleets in the external waters
- 2.3 Atlantic North Western Waters – Spanish fleets subject to the current Action Plan (2024)
- 2.4 Fisheries in the southern Baltic Sea – Polish example
- 2.5 Demersal mixed fisheries in the North Sea

## 2.1 Case Study 1: Fisheries in the Western Mediterranean

### France, Italy and Spain



*Loretta Malvarosa<sup>1</sup>, Rosaria F. Sabatella<sup>1</sup>, Alessandro Ligas<sup>2</sup>*

*<sup>1</sup> NISEA Soc. Coop., Via Irno 11, 84135 Salerno (Italy)*

*<sup>2</sup> Consorzio per il Centro Interuniversitario di Biologia Marina ed Ecologia Applicata (CIBM), V.le N. Sauro 4, 57128 Livorno (Italy)*

## 1. Background

In the Mediterranean and Black Sea, fisheries are generally multi-gear and multi-species, and small-scale fisheries (SSFs) play a key role in terms of number of vessels and employees in the fishing sector. This is despite the bulk of catches coming from medium- and large-scale fisheries using purse-seine (targeting large and small pelagics) and bottom trawling (targeting demersal stocks).

Within this context, a series of multiannual management plans (MAPs) have been introduced since 2013. These include the Western Mediterranean MAP (WestMed MAP) implemented by the European Union (EU) in 2019,<sup>(88)</sup> as well as other MAPs implemented under the General Fisheries Commission for the Mediterranean (GFCM) Recommendations: two in the Adriatic Sea (for demersal stocks in 2019 and small-pelagic stocks in 2021), and one in the Strait of Sicily for demersal stocks.

Bottom trawl fisheries in the Western basin are managed under the EU West Med WestMed MAP through Regulation (EU) 2019/1022<sup>(88)</sup>, which implements a fishing effort regime alongside other management measures (e.g. catch limits for red shrimps, *Aristeus antennatus* and *Aristaeomorpha foliacea*, introduced under the EU WestMed MAP since 2023).

Fleets managed solely through effort limitation (i.e. input control measures), such as most fisheries in the Mediterranean Sea, make this balancing of the fishing capacity with the fishing opportunities more uncertain, given the challenge of ensuring the actual effective fishing effort and harvesting capacity (that may be different from the nominal effort) to correspond to sustainable levels.

In the light of the existing EU WestMed MAP, an extensive amount of work has been performed by the Scientific, Technical and Economic Committee for Fisheries (STECF). Several STECF Expert Working Groups (EWGs), including those on Western Mediterranean stock assessment, Effort Regime, Balance between Capacity and fishing opportunities and MAP evaluation, have been tackling aspects related to the EU MAP in the Western Mediterranean. For example, a review of the balance between fleet capacity and fishing opportunities for the EU fleet in the Western Mediterranean has been carried out. Biological and economic indicators are routinely estimated and reported in the STECF EWG Balance reports.

A substantial body of scientific literature, including economic and social analysis, is available. Together, these sources of information help provide supporting evidence to better understand the causes of imbalance, as well as factors that influencing overcapacity. This includes the hyper-stability issues i.e. situations when effort reduction does not necessarily result in proportional reductions in fishing mortality, *F*. The information links). These issues are linked to the

---

<sup>(88)</sup> OJ L 172, 26.6.2019, p. 1–17

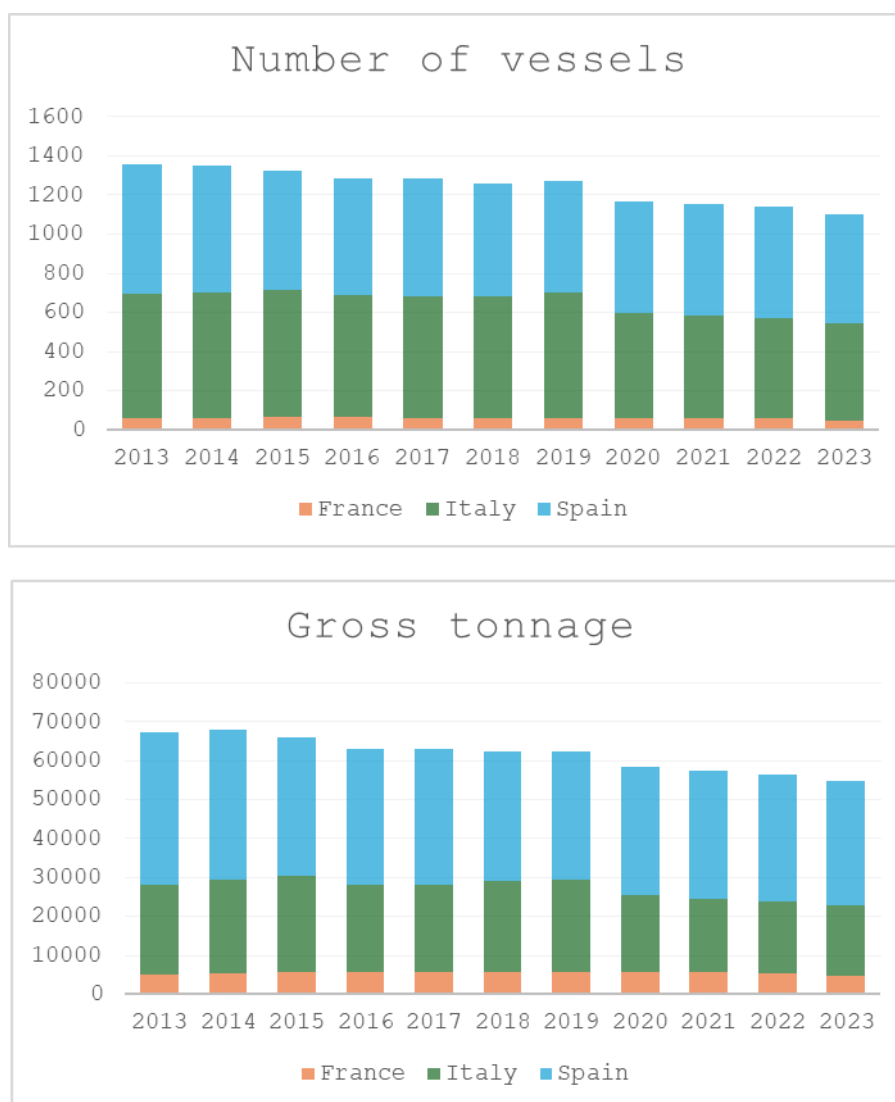
exploitation pattern and are informed by selectivity studies and reports (e.g. the Implemed project) and by studies on the landing obligation and discards (e.g. the MedBLand project, see Spedicato et al., 2022).

### 1.1. Overview of fleet capacity

The multiannual plan for fisheries exploiting demersal stocks in the Western Mediterranean (WestMed Plan) has been in force since 2019. Demersal fishing is highly important for the fleets operating in this region (Sabatella et al., 2021). Approximately 50% of the number of vessels are Spanish, 45% Italian and 5% French (average based on STECF Fisheries Dependent Information (FDI) data, 2021-2023). In terms of vessel size (Gross Tonnage, GT), the Spanish fleet is by far the most representative, accounting for 58% of the total GT (Figure 17). This is because the Spanish fleet has, on average, larger vessels compared to the Italian fleet (20 metres versus 18 metres overall length (LOA), on average, respectively).



**Figure 17 – Trend of capacity (number of vessels and GT) by country for the Western Mediterranean trawling fleets, 2013-2023**

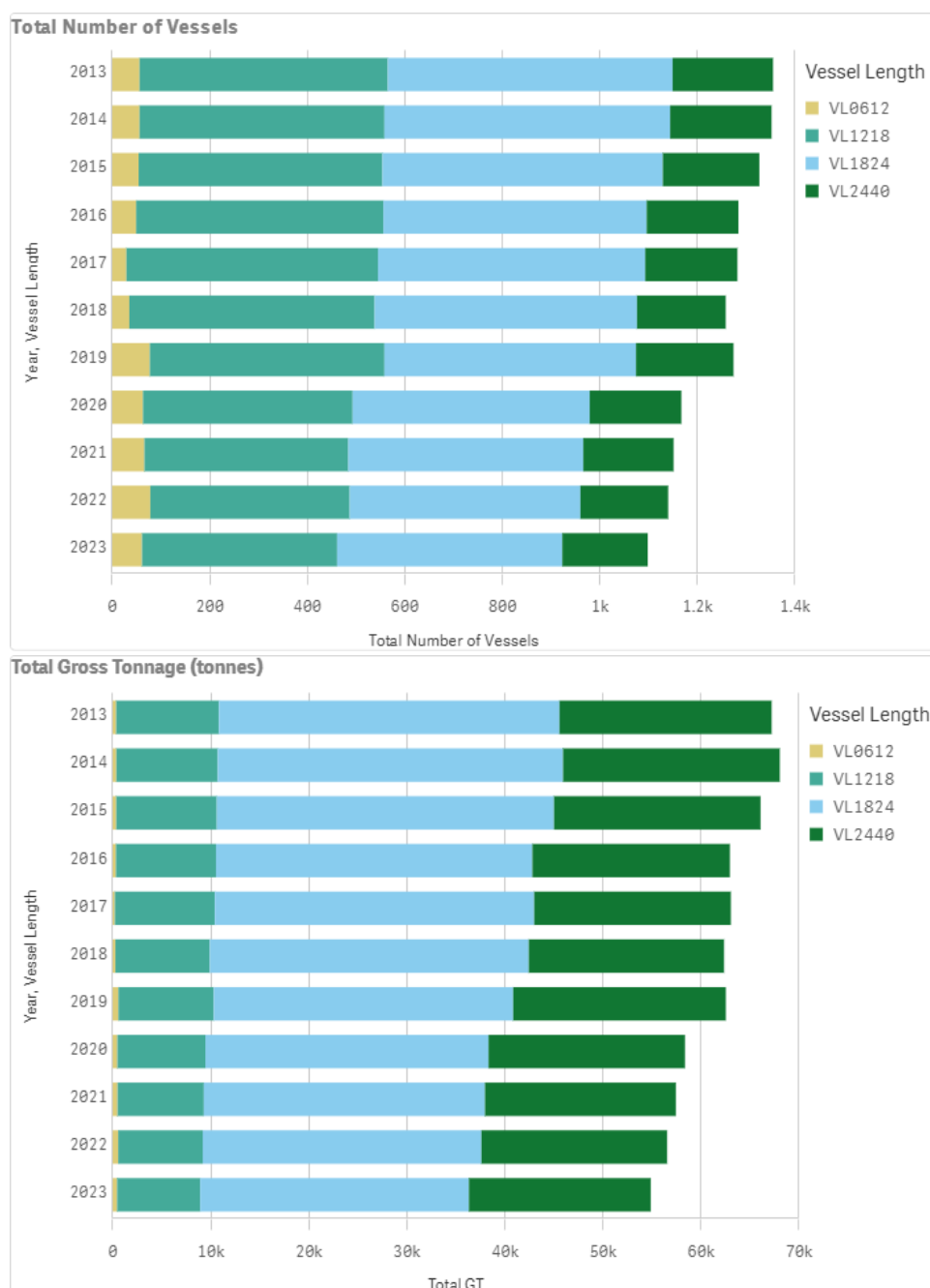


Source: elaboration on STECF Fisheries Dependent Information (FDI) data ([https://stecf.ec.europa.eu/data-dissemination/fdi\\_en](https://stecf.ec.europa.eu/data-dissemination/fdi_en))

The number of demersal trawlers operating in the Western Mediterranean in 2023 were around 1 100 vessels, which landed around 55 thousand tonnes. FDI data highlight an overall decrease of -18% in number and -19% in GT over the last 10 years (Figure 17), with differences at country level: data for Italy report the biggest decrease both in number and in GT (-22%) while data for France highlight the lowest decrease in terms of GT (-6%).

The biggest decrease, both in terms of number of vessels and in GT, is detected on the length class 18-24 metres (-21%) while vessels belonging to the class 12-18 metres show a decrease of -21% in number and -19% in tonnage (Figure 18).

**Figure 18 – Trend of capacity (number of vessels and GT) by length classes for the Western Mediterranean trawling fleets, 2013-2023.**



Source: FDI dashboard ([https://stecf.ec.europa.eu/data-dissemination/fdi\\_en](https://stecf.ec.europa.eu/data-dissemination/fdi_en))

From a technical perspective, the structure of the fleets from all three countries are very different, with French vessels being the biggest in terms of tonnage (95 GT on average) and Italian vessels being the smallest (37 GT on average).

**Table 32 – Average GT of the Western Mediterranean trawlers, by country and length classes, 2023**

| Vessel Length Category | France    | Italy     | Spain     |
|------------------------|-----------|-----------|-----------|
| VL0612                 | -         | 7         | 7         |
| VL1218                 | 24        | 19        | 25        |
| VL1824                 | 71        | 57        | 60        |
| VL2440                 | 123       | 132       | 97        |
| <b>TOTAL</b>           | <b>95</b> | <b>37</b> | <b>58</b> |

Source: elaboration on FDI data ([https://stecf.ec.europa.eu/data-dissemination/fdi\\_en](https://stecf.ec.europa.eu/data-dissemination/fdi_en))

## 1.2. Aims and objectives

This case study was conducted under Specific Contract No.01 “European Union’s fishing fleet: evolution, challenges and future” within the framework contract CINEA/2023/OP/0002. The overall objective of the case studies was to provide an overview of the main trends in regions, fisheries, and fleet segments that appear imbalanced with their fishing opportunities from 2015 onwards. This case study was one out of five EU case studies with structural overcapacity in the fleet/fishery, detailing the factors and barriers that have been an influence on why it has overcapacity or why it could not be addressed. Factors that contribute to successful balances of the capacity may also be identified wherever a balanced fishery is reported. Specifically, this case study aims to identify the factors contributing to overcapacity in the Western Mediterranean bottom trawl fishing fleets.

## 2. Methodology

### 2.1. General approach

A range of information and data sources has been used to inform this case study. These include a literature review, supplemented by an analysis of recently updated datasets on capacity and socio-economic data. The literature review has been used as a basis to draft an evidence-based background for the subsequent quantitative analysis. In addition, stakeholder consultation has been performed through a questionnaire aimed at collecting feedback on different aspects related to the management of fleet capacity and balance between capacity and resources in relation to the implementation of the EU WestMed MAP.

### 2.2. Literature review and data sources

This case study reviewed the balance of capacity against the fishing opportunities for the EU fleet.

- Biological and economic indicators are routinely estimated in the STECF EWG balance reports and GFCM WGFIT (Working Group on Fishing Technology) reports. STECF and GFCM stock assessment working groups reports (as well as the outcomes that are publicly available on GFCM and STECF/JRC websites); The GFCM SoMFi (State of Mediterranean and Black Sea Fisheries) reports, the GFCM Sub-regional Committees and the SAC reports were considered, as well as the Common Fisheries Policy (CFP) monitoring reports issued by STECF/JRC. The economic, biological, and technical/social indicators were evaluated in combination. STECF Balance Capacity EWG reports and national fleet reports. Agrocampus Atlas web platform used in the STECF Balance Capacity EWGs <sup>(89)</sup>.
- STECF EWGs Reports and Scientific literature around the Western Mediterranean Management Plan <sup>(90)</sup>.
- Fishing fleet capacities national reports <sup>(91)</sup>.
- A specific data request was directly addressed to the Italian Ministry to gather production and economic data for Italy at the GSA level (GSAs 9, 10 and 11, which are included in the EMU2 of the WestMed MAP); data for Spain and France are already available from the AER and FDI <sup>(92)</sup>.

---

<sup>(89)</sup> [https://sirs.agrocampus-ouest.fr/stecf\\_balance\\_2023/index.php?action=fiche&code=BEL-NAO-TBB1824-NGI-%2A&type\\_code=FS&atl\\_version=0&idlang=uk](https://sirs.agrocampus-ouest.fr/stecf_balance_2023/index.php?action=fiche&code=BEL-NAO-TBB1824-NGI-%2A&type_code=FS&atl_version=0&idlang=uk)

<sup>(90)</sup> [https://stecf.ec.europa.eu/reports/evaluation-effort-regimes-reports\\_en](https://stecf.ec.europa.eu/reports/evaluation-effort-regimes-reports_en)

<sup>(91)</sup> [https://oceans-and-fisheries.ec.europa.eu/fisheries/rules/fishing-fleet-capacities/fleet-capacity-reports-2023\\_en](https://oceans-and-fisheries.ec.europa.eu/fisheries/rules/fishing-fleet-capacities/fleet-capacity-reports-2023_en)

<sup>(992)</sup> [https://stecf.ec.europa.eu/reports/economic-and-social-analyses\\_en](https://stecf.ec.europa.eu/reports/economic-and-social-analyses_en)

### 2.3. Stakeholder consultation

Key stakeholders relevant to the Western Mediterranean bottom trawl fisheries were identified to help better understand some of the main aspects under the effort management plan currently in place (Table 33). Representatives from the national administrations of Italy, France and Spain, MEDAC (Mediterranean Advisory Council) and an NGO were contacted. Further to this, to obtain feedback on the potential factors deemed to affect overcapacity, key representatives from various academic and research institutes were consulted.

**Table 33 – List of key stakeholder groups relevant to fisheries exploiting demersal stocks within the Western Mediterranean multiannual plan**

| MS  | Entity             | Affiliation                                                                                                                                                         |
|-----|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IT  | National authority | Ministero delle Politiche Agricole Alimentari e Forestali; Direzione Generale della Pesca Marittima e de l'Acquacoltura                                             |
| ALL | Fishery body       | Mediterranean Advisory Council (MEDAC, including POs)                                                                                                               |
| ALL | NGO                | WWF Med                                                                                                                                                             |
| FR  | National authority | SPMAD/SDRHA/BASD Ministère de la transition écologique et de la cohésion des territoires Direction Générale des Affaires Maritimes, de la Pêche et de l'Aquaculture |
| ALL | Fishery body       | GFCM                                                                                                                                                                |
| ALL | Scientific body    | STECF                                                                                                                                                               |
| IT  | Research institute | CNR IRBIM                                                                                                                                                           |
| ES  | Research institute | IEO                                                                                                                                                                 |
| ES  | National authority | Ministerio de Agricultura, Pesca y Alimentación; Subdirección General de Investigación Científica y Reservas Marinas; Secretaría General de Pesca                   |

Members of the case study team were important to help identify local contact points/national correspondents to explain the imbalanced situation in detail and provide solutions/opinions for addressing these recurrent imbalance issues.

The general methodology defined under the Specific Contract was implemented, with the submission of a semi-structured questionnaire (Appendix 1), and face-to-face online interviews and/or meetings, some of those meetings including multiple stakeholders. In total, 19 stakeholders provided their input.

## 3. Results

### 3.1. Results from data analysis

Despite some recent positive trends in terms of stock status and Balance-Capacity indicators (e.g. Sustainable Harvest Indicator SHI, and Stock at Risk SAR), fleet segments within the bottom trawl demersal fisheries in the Western Mediterranean remain out of balance. The following results based on various information and data sources help to better understand the determinants and barriers that prevent this imbalance from being corrected.

According to the stock assessment analyses performed by both GFCM and STECF, the number of demersal stocks fished sustainably has increased, particularly deep-water rose shrimp and red mullet. However, European hake still shows the highest overexploitation ratio, needing reductions in fishing mortality more than 50% to reach the target fishing mortality in all GSAs of the Western Mediterranean (FAO, 2023; GFCM, 2024a; STECF, 2024a,b). It was also noted that the number of stocks with biomass reference points had increased, enabling the forecast under different scenarios of fishing mortality (F) reduction. As concerns the bottom trawl fisheries in the Western Mediterranean, despite the landing obligation (LO) being in force since 2019, there is little evidence of a change in behaviour or major improvements in gear selectivity to improve sustainability of stocks (Damalas et al., 2018). As observed by STECF (STECF 23-04 and 23-06), the approach taken by many Mediterranean Member States and High-Level Groups is to request exemptions to maintain the status quo.

The report on the monitoring and evaluation of EU CFP towards achieving the MSY objectives (STECF, 2024a) shows improved stock status in the Western Mediterranean, even though fishing mortality is, in general, still above  $F_{MSY}$ .

Table 34 summarizes the results of two indicators computed using a state-space model as implemented in the R package JARA (Winker et al, 2019). Model outputs for  $F/F_{MSY}$  for 27 stocks in the Western Mediterranean show a slightly decreasing trend, with the lowest value (still above 1 though) in 2021. The second indicator is based on the ratio between SSB and the SSB estimated in 2003. The largest value (1.43) is observed in 2021, showing an improvement of the SSB of the 27 stocks considered in the Western Mediterranean.

**Table 34 – Trend in  $F/F_{MSY}$  and  $SSB/SSB_{2003}$  (based on 27 stocks) in the Western Mediterranean (indicators reference year 2021)**

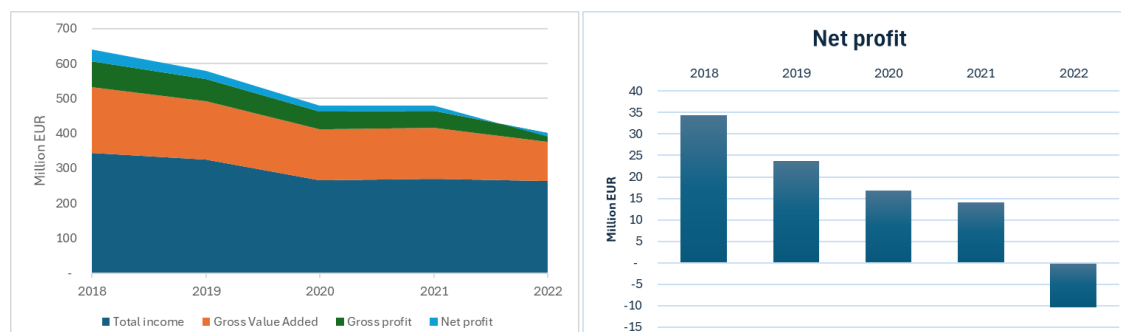
|                  | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------------------|------|------|------|------|------|------|------|------|------|------|
| $F/F_{MSY}$      | 1.89 | 2.01 | 1.94 | 1.99 | 2.00 | 1.86 | 1.97 | 1.89 | 1.95 | 1.85 |
| $SSB/SSB_{2003}$ | 1.00 | 1.16 | 1.26 | 1.22 | 1.23 | 1.13 | 1.05 | 1.03 | 1.02 | 1.09 |
|                  | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
| $F/F_{MSY}$      | 1.77 | 1.69 | 1.60 | 1.53 | 1.48 | 1.53 | 1.47 | 1.26 | 1.13 | -    |
| $SSB/SSB_{2003}$ | 1.14 | 1.22 | 1.27 | 1.29 | 1.37 | 1.37 | 1.34 | 1.30 | 1.43 | -    |

Source: STECF, 2024a.

Over the past five years, demersal trawlers operating in Western Mediterranean have faced a substantial decline in total income. This downward trend is reflected in Gross Value Added, Gross Profit, and Net Profit, all of which have steadily decreased. The decline has been gradual, with a particularly sharp drop after 2019. Net profit, which had exceeded EUR 30 million in 2018, has consistently fallen year after year, and in 2022 net profit turned negative, indicating a financial loss (Figure 19). Direct subsidies are excluded from net profit calculations, yet they play a crucial role in segment profitability. In 2022, operating subsidies surged by 162% compared to 2021. If subsidies are included in the calculations,

the demersal trawlers' profit for 2022 would remain overall positive (STECF, 2024c).

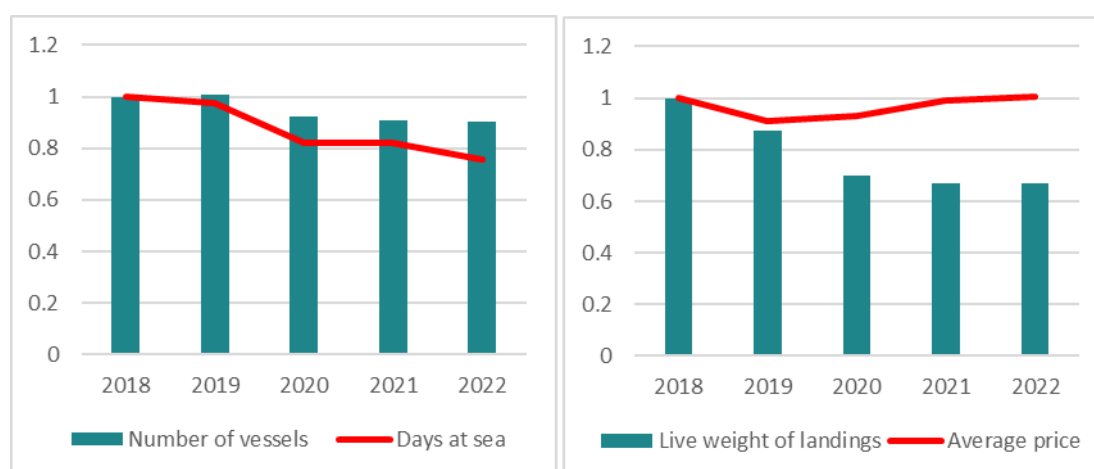
**Figure 19 – Trend in main economic indicators for demersal trawlers operating in Western Mediterranean**



Source: For France and Spain: [https://stecf.ec.europa.eu/reports/economic-and-social-analyses\\_en](https://stecf.ec.europa.eu/reports/economic-and-social-analyses_en). For Italy, Italian Ministry of Agriculture, Food Sovereignty and Forestry data

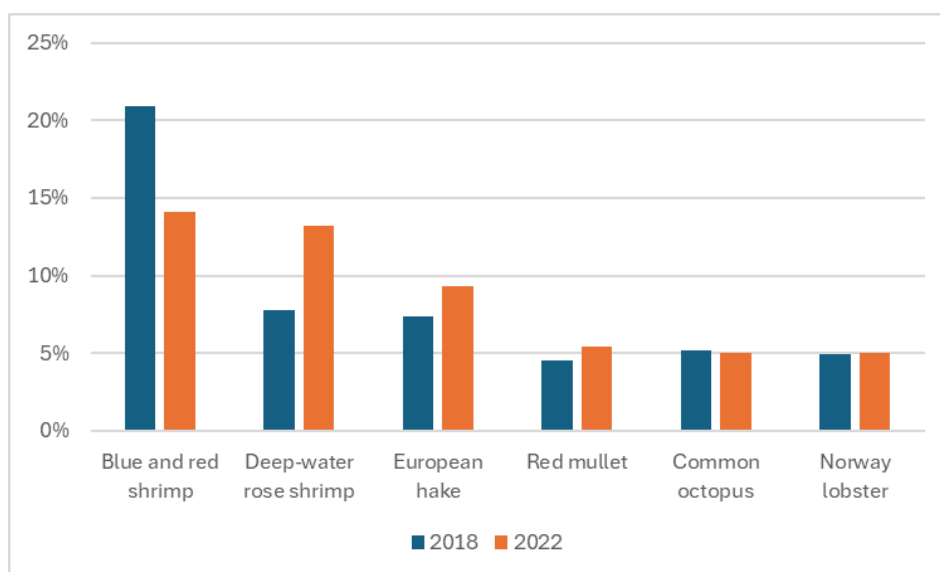
Between 2018 and 2022, the gross value of landings declined by approximately 23%, while the active fleet shrank by 10% and the number of days at sea decreased by 24% (Figure 20). This loss is primarily driven by a reduction in catch volumes, which has not been compensated by higher producer prices. Prices have remained relatively stable, averaging around EUR 7.00/kg (Figure 20). Additionally, shifts in catch composition have influenced price trends: the share of blue and red shrimps has declined, while the landings of deep-water rose shrimp and European hake have increased (Figure 21). It is however worth mentioning that other species (e.g., anglerfish, squids, etc.) are landed and represent important revenues for trawlers.

**Figure 20 – Trend in number of vessels and days at sea (on the left) and live weight of landings and average price (on the right), demersal trawlers, Western Mediterranean, year 2018 and 2022**



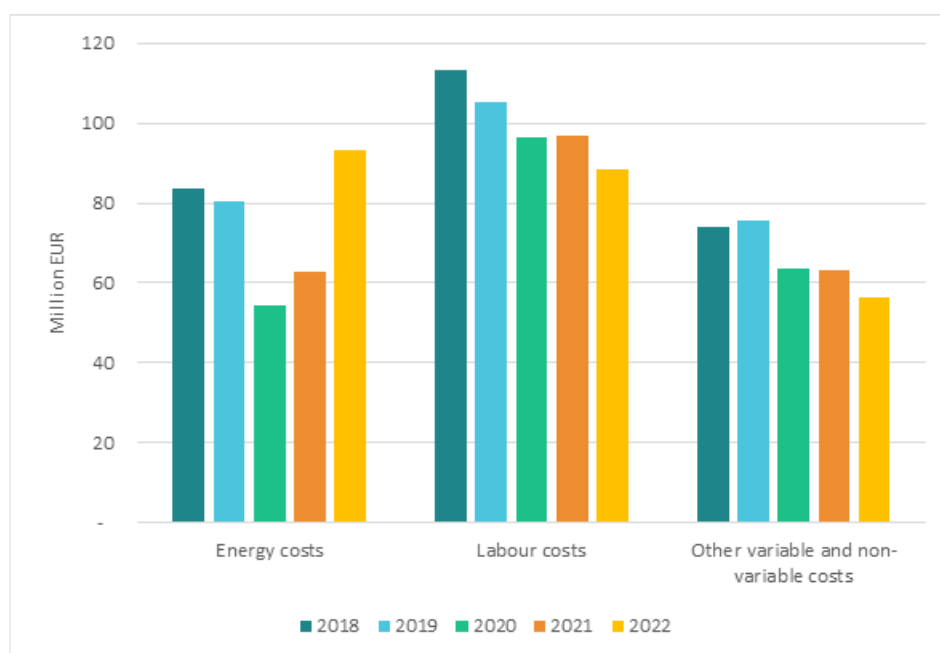
Source: For France and Spain: [https://stecf.ec.europa.eu/reports/economic-and-social-analyses\\_en](https://stecf.ec.europa.eu/reports/economic-and-social-analyses_en). For Italy, Masaf data



**Figure 21 - Composition of total value of landings, main species, demersal trawlers, Western Mediterranean, year 2018 and 2022**

Source: For France and Spain: [https://stecf.ec.europa.eu/reports/economic-and-social-analyses\\_en](https://stecf.ec.europa.eu/reports/economic-and-social-analyses_en). For Italy, Masaf data

Until 2021, gross profit closely mirrored the trend of the gross value of landings. From 2018 to 2021, operating costs steadily declined as fleet activity decreased. A key factor in this was the continuous drop in fuel costs, aided by stable and relatively low prices up until mid-2021. In 2022, a sharp rise in diesel prices accelerated the decline in profitability already underway in previous years, ultimately pushing trawl fleets in the area into financial losses (Figure 22).

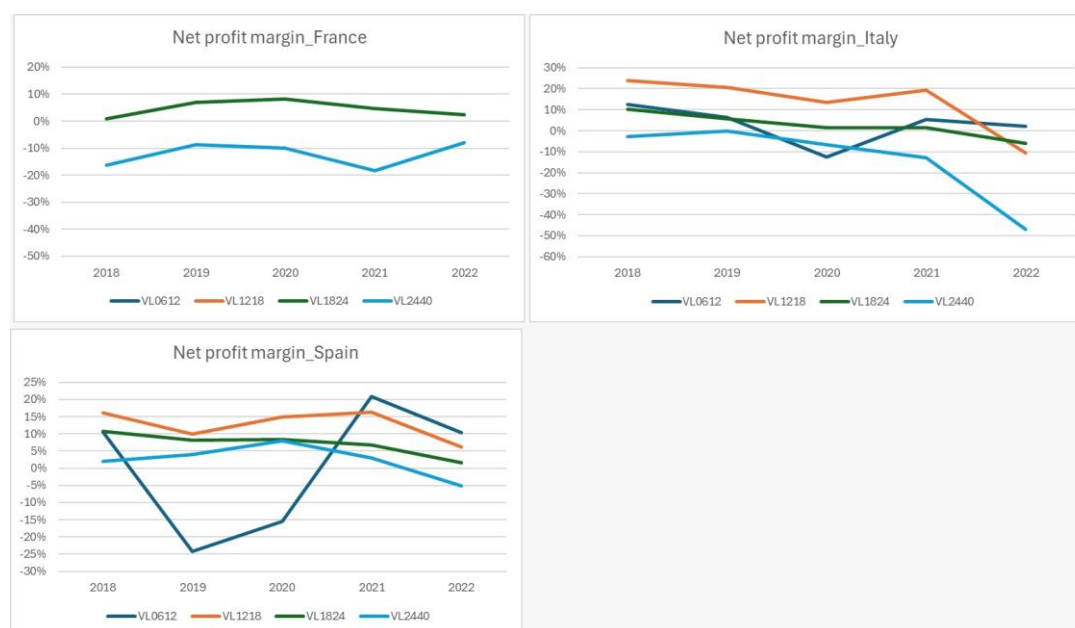
**Figure 22 – Trend in main operational costs for demersal trawlers, Western Mediterranean, year 2018 and 2022**

Source: For France and Spain: [https://stecf.ec.europa.eu/reports/economic-and-social-analyses\\_en](https://stecf.ec.europa.eu/reports/economic-and-social-analyses_en). For Italy, Masaf data

These impacts have varied across vessel sizes and Member States in the Western Mediterranean. In France, the DTS2440 fleet segment (demersal trawlers/seiners 24–40 m) consistently showed negative net profit margins throughout the period, with a particularly sharp decline in 2021. The DTS1218 segment (12–18 m) maintained relatively stable profitability until 2020 but experienced a notable drop in 2021 and 2022. In Italy, the DTS1218 segment remained profitable until 2021, but saw a significant downturn in 2022, turning negative. The DTS2440 segment showed a progressive decline, culminating in a steep negative margin in 2022, likely driven by rising operating costs.

In Spain, the DTS1218 segment maintained positive margins across all years, although with some fluctuations. The DTS2440 segment showed modest profitability until 2021, but turned negative in 2022, suggesting increased cost pressures (Figure 23).

**Figure 23 – Net profit margin for demersal trawlers by vessel length by Member State, Western Mediterranean, year 2018 and 2022**



Source: For France and Spain: [https://stecf.ec.europa.eu/reports/economic-and-social-analyses\\_en](https://stecf.ec.europa.eu/reports/economic-and-social-analyses_en) . For Italy, Masaf data

Based on information provided in the national Fleet Capacity Reports, 15 fleet segments are out of balance in the Western Mediterranean Sea out of a total of 19 fleet segments (Table 35). Imbalance was defined based on SHI and SAR indicators (even if the balance indicators cover also the economic dimension – ROFTA and CR/BER - and the vessels' utilisation level); for Italian vessels, the segments considered were those with SHI indicator values larger than 1 and a threshold above 40% for at least two out of three years in the reference period. Dependence on overfished species in different years is highlighted for all out of balance fleet segments (Table 35).

Economic indicators show variability not only across different vessel size classes but also across different fishing areas except for the DTS2440 segment with

negative economic performance indicators across all areas. Medium-sized trawlers (VL1218; vessel length class between 12 and 18 m) show a more favourable situation, with positive indicators in all areas except GSA 10 (Table 35). Italian demersal trawlers in GSA 11 and GSA 10 appear to have the most challenging economic conditions.

**Table 35 – Balance assessment by demersal fleet segments in Western Mediterranean according to national Fleet capacity reports 2024, indicator reference year 2022**

| Country | GSA    | Fleet segment | No of active vessels in 2022 | SHI  | SAR | ROFTA | CR/BER | VUR | Balance assessment by National authorities |
|---------|--------|---------------|------------------------------|------|-----|-------|--------|-----|--------------------------------------------|
| ESP     |        | DTS0612       | 24                           | <40% |     |       |        |     | Out of balance                             |
| ESP     |        | DTS1218       | 139                          |      |     |       |        |     | Out of balance                             |
| ESP     |        | DTS1824       | 284                          |      |     |       |        |     | Out of balance                             |
| ESP     |        | DTS2440       | 124                          |      |     |       |        |     | Out of balance                             |
| FRA     |        | DTS1218       | 3                            |      |     |       |        |     | Out of balance                             |
| FRA     |        | DTS1824       | 26                           |      |     |       |        |     | Out of balance                             |
| FRA     | GSA 7  | DTS2440       | 29                           |      |     |       |        |     | Out of balance                             |
| ITA     | GSA 9  | DTS0612       | 30                           | <40% |     |       |        |     | In balance                                 |
| ITA     | GSA 9  | DTS1218       | 91                           |      |     |       |        |     | Out of balance                             |
| ITA     | GSA 9  | DTS1824       | 82                           |      |     |       |        |     | Out of balance                             |
| ITA     | GSA 9  | DTS2440       | 9                            |      |     |       |        |     | Out of balance                             |
| ITA     | GSA 10 | DTS0612       | 13                           | <40% |     |       |        |     | In balance                                 |
| ITA     | GSA 10 | DTS1218       | 118                          |      |     |       |        |     | Out of balance                             |
| ITA     | GSA 10 | DTS1824       | 56                           |      |     |       |        |     | Out of balance                             |
| ITA     | GSA 10 | DTS2440       | 2                            |      |     |       |        |     | Out of balance                             |
| ITA     | GSA 11 | DTS0612       | 11                           | <40% |     |       |        |     | In balance                                 |
| ITA     | GSA 11 | DTS1218       | 58                           | <40% |     |       |        |     | In balance                                 |
| ITA     | GSA 11 | DTS1824       | 25                           |      |     |       |        |     | Out of balance                             |
| ITA     | GSA 11 | DTS2440       | 16                           |      |     |       |        |     | Out of balance                             |

Source: National Fleet capacity reports 2024 [https://oceans-and-fisheries.ec.europa.eu/fisheries/rules/fishing-fleet-capacities/fleet-capacity-reports-2023\\_en](https://oceans-and-fisheries.ec.europa.eu/fisheries/rules/fishing-fleet-capacities/fleet-capacity-reports-2023_en)

Measures implemented under the three national action plans for the Western Mediterranean Sea (Spain, France and Italy) for the demersal trawl fleets include:

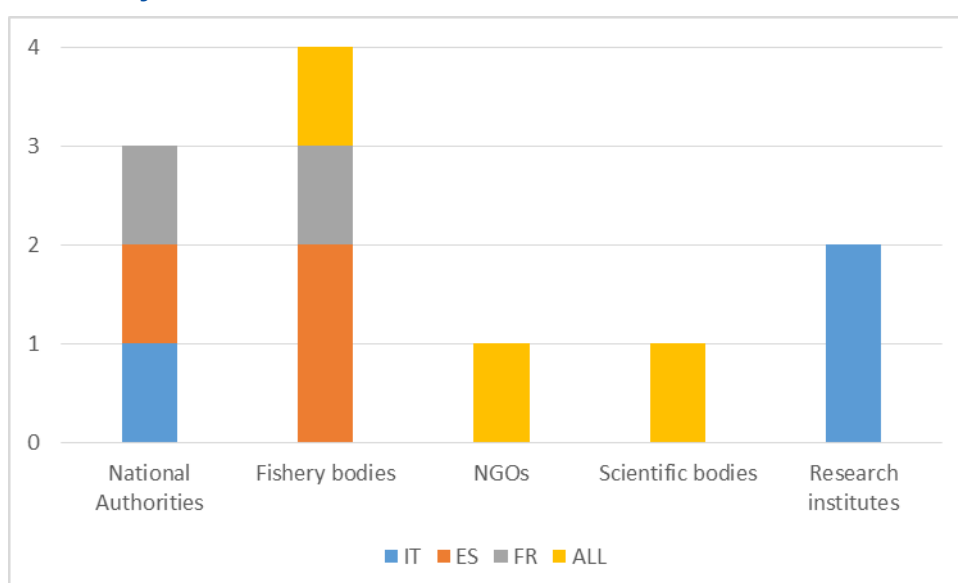
- Additional effort reduction in terms of days at sea
- Spatial and time-based closures
- Permanent cessation of fishing vessels
- Improvement of the trawl selectivity through pilot projects and temporary cessation of fishing activities

In addition to the above, in 2023, Spain planned to give an additional 5% of fishing days to all trawlers replacing their nets with more selective mesh as an incentive to improve fishing gear selectivity.

### 3.2. Results from stakeholder consultation

Feedback was received from all national authorities from EU Member States associated with the Western Mediterranean EU MAP, namely Spain, France and Italy. Additional replies were received from the MEDAC, the GFCM, representatives of fishing industry and associations, NGOs and national experts. In some cases (i.e., national authorities), the reply from the stakeholders contacted was provided by means of a joint/shared answer. In other cases (i.e., MEDAC), more than one answer was collected, thus allowing to have feedback either from a regional perspective and from single associated members, representing the view of country-based POs or association of fishing cooperatives (e.g., for Spain and France). Figure 24 summarizes the number of questionnaires collected by stakeholder category.

**Figure 24 – Number of questionnaires collected by stakeholder group and nationality**



Source: Own results

The following provides a synthesis of the replies based on the topics addressed by each question.

Q. What are the main drivers behind reported changes in fleets in balance or out of balance over the past 5 years?

Spain, France and Italy have large and diverse fishing fleets. Each **fleet segment is affected by** various factors, so it is difficult to identify common drivers. However, according to responses given, the **main drivers** can be summarized as follows:

- Implementation of the WestMed MAP with an overall 40% reduction in fishing effort over 5 years, which, according to the stakeholders, has induced short term imbalance on the economic indicators.
- Overfishing.
- Overcapacity.
- Ageing of fishers and vessels.
- The recent energy price crisis (mostly caused by Russia's unprovoked aggression against Ukraine) has a negative impact on the economic performance of the fishing fleets.
- The stocks status showed improvement, though hake stocks are still with a current biomass below  $B_{lim}$ .
- The impact of the environmental factors (climate change) on the stocks and fisheries.

Some respondents from the POs pointed out that the current scientific advice is not including environmental variables, thus the impact of external factors (e.g. pollution, climate change) on biological reference points is unknown. In addition, the lack of a global/ecosystem vision is a matter of concern: a large number of exploited stocks is still not covered by scientific advice. According to the feedback received by both POs and national authorities, the economic impact of the COVID-19 pandemic on the EU fishing sector was smaller than expected and had a minimal impact on the fleets.

Q. What are the causes of the current fleets in balance or out of balance situation (e.g. resources status, fisheries management measures, markets, BREXIT, EMFAF)?

According to the perception of the consulted stakeholders, the **main causes of balance status** of the fleets operating in the Western Mediterranean can be summarized as follows:

- Poor stocks status.
- The recent energy price crisis.
- The raising impact of the environmental factors (climate change).
- Ageing of fishers and the weak or lack of generational turnover.

- The Western Mediterranean EU MAP and the consequent fishing effort reduction.

It is worth mentioning that according to both POs and national authorities, the WestMed MAP has to be seen as a consequence/response to the out of balance status of several fisheries in the Western Mediterranean rather than a driver/cause. Some respondents highlighted that the usual 2-year delay of scientific advice (i.e. 2023 advice for the Fisheries Opportunities (2024 is based on data up to 2022) may pose the risk of management measures not fitting the current fisheries and fleets situation; in addition, robust socio-economic analyses are missing: therefore, the management measures are mostly supported by stock related information (fishing mortality, biomass reference points), while economic and social aspects are almost neglected, in the respondents' opinion.

Q. What current management decisions have been adopted to maintain the fleet in balance (e.g. reduction of fishing capacity, flexibility in quota management, financial support, SWAPs)?

The **measures applied to achieve fleet balance** can be grouped into the following types of actions:

- The WestMed MAP for a reduction of demersal trawling effort, including measures such as fishing effort regimes (maximum number of fishing days), temporary bans, permanent cessation, etc.
- Stock improvement through the implementation of control measures, catch limits, fisheries restricted areas, etc.
- Improving knowledge on the stocks and fisheries through dedicated surveys and monitoring programs.
- Catch limits for red shrimps.
- Measures supported by the European Maritime Fisheries and Aquaculture Funds (EMFAF), for example, permanent and temporary cessations (e.g. temporary cessation in Italy on a yearly basis).
- Compensation mechanisms were introduced to reward fishers adopting sustainable practices, offering additional flexibility in effort allocation for those implementing measures like increased gear selectivity.

Q. Is the permanent cessation program effective at managing fleet balance? What are other solutions and why could these be effective?

According to the respondents, the **permanent cessation** can effectively reduce fishing capacity. However, it may have negative social and economic impacts on coastal communities, so it should only be used after other measures, like temporary cessations, have failed. While it helps manage fleet balance, its effectiveness has been mixed, and there are concerns about delayed socioeconomic impact assessments leading to an excessive request of funding. It is recommended to wait for updated bio-ecological and socio-economic data before implementing new decisions.



According to respondents, permanent cessation is most effective when applied to fleet segments that are the sole contributors to stocks in poor biological condition, but less effective when multiple fleet segments are involved. However, this measure has irreversible economic and social consequences, particularly for affected coastal populations, and should only be used after comprehensive analysis and prior management measures, like closed seasons or temporary cessations, have not worked. Alternative measures include reducing fleet capacity through licences limitation/ceiling or reduction. Temporal closures are also a viable option to reduce economic loss while redistributing fishing efforts. Temporal closures are also a viable option to reduce economic loss while redistributing fishing efforts.

**Q. What is causing inactivity in the fleets and what management measures can be used to mitigate this?**

Most **inactive vessels** are under 12 metres, where fishing is a complementary activity, in most cases. According to respondents, **fleet inactivity** is driven by factors like ageing crews, difficulty in finding new crew members, and inefficient vessels. To reduce inactivity, diversification of fishing practices, financial support, and training are recommended. Investments in vessel renewal and attracting younger workers are also crucial.

According to some respondents (i.e., POs), the WestMed MAP has contributed to fleet inactivity, and more flexibility in transferring unused effort quotas to the subsequent year is suggested to reduce socio-economic impacts. However, the priority, to them, is to strengthen scientific research to create more accurate stock assessments and management measures. Current compensation measures are complex, costly for small businesses, and may not effectively offset the negative impacts.

**Q. What future opportunities and management measures can be used to improve implementation of fleet balance indicators and how?**

To **improve fleet balance indicators**, some respondents suggest a new approach to data collection in the Mediterranean, aimed at providing and submitting more detailed and disaggregated data for each fishing area (GSA). This would help tailor management measures and guide the transition to sustainable fishing practices. Additionally, some respondents suggest that revising EMFAF would be necessary to support fishing units during this transition.

Respondents believe that fleet balance indicators are useful for assessing resource status and guiding fishers toward sustainable practices, but improvements in methodology are needed. For instance, indicators like the Vessel Utilization Ratio (VUR) and Stock at Risk (SAR) have limitations. VUR may not accurately reflect imbalance in fleets with part-time or seasonal fishers, especially for small vessels. SAR can be overestimated, particularly for shared stocks with non-EU countries, and needs case-by-case scrutiny.

Some respondents believe that, in the Western Mediterranean, instead of introducing more measures, the focus should be on improving the implementation of existing measures (like effort quotas and closures) and evaluating their effectiveness over time.

Q. Specifically, what has been the impact of the Western Mediterranean Multiannual Plan (MAP) on the fleets in terms of sustainability of fisheries and stocks, viability of the fleets, and fleet performance?

The **multiannual plan for the Western Mediterranean (WestMed MAP)** has been seen as a response to the out of balance status of most of the fisheries, but its **impact on fleet** sustainability and performance is still unclear due to the short time since its implementation (2019). While respondents believe that the MAP has led to some positive trends in fish stock recovery, key measures, like the fishing effort regime, aimed at stock recovery, they believe these measures have not achieved the desired results.

Some respondents argue that further reductions in fishing effort beyond the current 40% could push fleets to bankruptcy, threatening the socio-economic heritage without reversing stock declines. Respondents believe that the EU's approach has not fully considered external factors (e.g. climate change, pollution) impacting fish mortality, and there is a call for a more holistic approach, combining effective management of overfished stocks with support for the sector's innovation and transition.

Critics also point out that the MAP has focused primarily on bottom trawling when assessing impacts on commercial species, neglecting other fishing gears that also negatively affect resources. The plan's current direction is viewed by some as leading the fleet toward an unsustainable future, with no clear transition phase defined by the regulation.

At a regional level, some respondents recalled that actions aimed at managing fleet capacity of EU and non-EU fleets are taken also through the implementation of the following GFCM Recommendations:

- Rec. MCS GFCM/34/2010/2 on the management of fishing capacity.
- Rec. GFCM/37/2013/2 on guidelines on the management of fishing capacity in the GFCM area of application.
- Rec. CM GFCM/46/2023/12 on the establishment of a regional fishing capacity management plan (for fishing vessels larger than 15 m LOA).
- Rec. MCS GFCM/46/2023/23 clarifying the application of compliance recommendations and establishing a compliance and capacity inventory to support the work of the Compliance Committee.

The Recommendation GFCM/46/2023/12 represents a first step towards consolidating the state of play and begin building regional fishing capacity management plan, taking into consideration that currently only 8% of fishing

vessels operating in the GFCM area of application are covered by active GFCM management plans. The implementation of this Recommendation will permit enforcing capacity-based fisheries management in the GFCM area of application, applying capacity ceilings in line to the EU Common Fisheries Policy (CFP) and WestMed MAP.

#### 4. Discussion

In the Western Mediterranean, almost all demersal trawl fisheries targeting demersal stocks appear to be out of balance with their fishing opportunities since 2020 (15 fleet segments are out of balance out of a total of 19 fleet segments). Imbalance was defined based on SHI and SAR indicators; **most stocks with validated assessments continue to be fished beyond biologically sustainable limits**. The objectives of the WestMed plan are to align fishing opportunities with biological productivity, based on the biological reference point ( $F_{MSY}$ ), which was to be achieved by 1st January 2025 with a progressive reduction (up to 40%) of the fishing effort from historical levels. The available data do not allow us to verify the effectiveness of the plan and the achievement of this goal (the last available data refer to year is 2022). However, recent stock assessments by GFCM and STECF confirm **an increase in sustainably exploited demersal stocks**, especially shrimps and red mullet across all GSAs in the Western Mediterranean (FAO, 2023; GFCM, 2024a; STECF, 2024a,b).

From an economic perspective, the trawl fleets operating in the region have faced a steady **decline in profitability**. Bioeconomic analyses of the WestMed MAP, applied to demersal fisheries in GSA6, confirm that achieving  $F_{MSY}$  requires a gradual reduction in fishing effort, leading to prolonged periods of declining catches and financial losses spanning several years (Sola et al., 2020). While these measures are essential for ensuring environmental sustainability, they also intensify socioeconomic difficulties, resulting in fleet reductions, lower incomes and deteriorating working conditions (Gómez and Maynou, 2020).

Between 2018 and 2022, the economic situation of the fishing sector was influenced by **external factors** that directly impacted their short-term profitability. The EU fisheries sector was affected by rising energy prices in the course of 2021, and Russia's aggression against Ukraine has led to a further escalation in energy costs. The economic performance of the demersal fishing fleet deteriorated significantly; **in 2022, demersal fleets experienced a net loss**. Both events created the need for sector support; subsidies were allocated to compensate for temporary inactivity and to alleviate the impact of rising operational costs. **These financial aids partially offset the economic losses recorded**. As also confirmed by the feedback received from the questionnaires and interviews, the EU fishing fleet was overall not severely affected by the COVID-19 pandemic despite decreases in fishing activity, landings weight and value. This is mainly due to a corresponding reduction in fishing costs from a decreased fishing activity and low fuel prices (Carpenter et al., 2023).

A more detailed analysis by size class reveals that the DTS2440 fleet segment experienced economic imbalance across all fishing areas. The largest vessels are at the greatest financial risk, as their operational days fall below the threshold required for economic viability (Sabatella et al., 2021). The threshold value is defined as the average number of fishing days per vessel below which fishing activity becomes economically unsustainable, as indicated by a CR/BER ratio falling below 1. When fishing activity drops below the viability threshold, vessels are unable to cover operational costs, leading to economic unsustainability and increased vulnerability for the fleet segment.

In consideration of the opinion of the POs stakeholders, the progressive reduction of fishing effort – up to 40% from historical levels, as outlined in the WestMed MAP – directly undermines economic viability, although in the medium-long term the improvement of stocks will enhance a recovery of the economic viability of the fishing sector.

The analysis of capacity and, consequently, of the balance between capacity and resources, must consider the **spatial mobility of fishing vessels**, which often operate in fishing areas far from their port of registry, the one used in official registers to monitor fleet size or capacity. In particular, a comparison between the AER and FDI datasets for the Italian fleet (the first based on the landing area, mostly coinciding with the port of registration, and the second on the operational area) reveals a discrepancy of approximately 7% in terms of volume of landings and 6% in terms of effort (GT\*fishing days). This difference reflects the fact that an additional number of vessels (other than those registered in ports of the GSAs belonging to the Western Mediterranean basin) operate in the Western Mediterranean waters, thereby **influencing operational capacity and fishing effort**, exerted there.

From the feedback received from stakeholder consultation, it was possible to derive that **there is the need to increase the input of socio-economic analyses into balance assessment**, which are currently overshadowed by stock-related information. **The lack of generational turnover** among fishers and the ageing of fleets further exacerbated the situation. This demographic stagnation limits innovation, adaptability, and investment capacity within the sector. **Environmental factors**, such as climate change and pollution, also affect fish stocks, and, thus, fleet balance, even though they are not addressed explicitly in current advice.

Some respondents from the POs suggest that the current management measures, such as permanent fishing cessation, may lead to significant social and economic impacts on affected communities. Alternatives like spatial-temporary cessations are preferable according to the respondents', as they are less impacting on the economy of local communities.

In terms of improving fleet balance, **stakeholders from POs recommend an improved data collection and the submission of raw/disaggregated data to**

**EU Data Calls**, especially for small-scale and seasonal fisheries. This response from the interviewed stakeholders likely reflects the belief that access to more detailed and disaggregated data would significantly improve the ability to assess and address fleet imbalance. Raw or more disaggregated data - covering fishing effort, catch composition, and economic performance - enables a more nuanced understanding of how different segments of the fleet operate across seasons, regions, and gear types. Revising European funding guidelines (EMFAF) and strengthening scientific research are seen as crucial for guiding future sustainable fishing practices. Some stakeholders from POs call for an improved evaluation of existing management measures and a shift towards long-term solutions improved to address the challenges facing the sector.

The WestMed MAP is seen by some as a long-term response to the imbalanced status of fisheries but has faced criticism by some stakeholders, mostly from POs, for being focused primarily on bottom trawling, neglecting other fishing methods. Some stakeholders argue that further reductions in fishing effort could lead to fleet bankruptcies without reversing the decline of some stocks, such as European hake, possibly due to other factors (e.g., environmental factors). There is also **a call for a more holistic approach to fisheries management**, which would incorporate external factors like climate change and pollution and better support the transition of the fishing sector to more sustainable practices by accounting for those factors whenever adjusting fishing opportunities

## 5. Conclusions and recommendations

Through the literature review findings and the questionnaires, feedback was received from the national authorities of all the EU Member States, namely Spain, France and Italy, interested by the Western Mediterranean EU MAP, together with those from the MEDAC (including representatives of fishing industry and associations), the GFCM, NGOs and national experts. The analysis of the feedback received through the questionnaires provided the following key messages:

- **Main drivers of fleet balance status:** overfishing, despite a slight improvement of the stocks' status in the Western Mediterranean since 2020; in addition, a negative role in affecting the balance status of the EU fleet is played also by the energy crisis (related to Russia's aggression against Ukraine) and factors external to fishing, such as climate change, invasive species and marine pollution added to overfished stocks.
- **Obsolescence of the fleets:** actions need to be taken to hinder fleet technological obsolescence and inactivity and foster fishers' generational renewal.
- **Improved data collection:** need of disaggregated data for better feeding fleet balance indicators; need for robust socio-economic analyses aimed at giving greater relevance to economic and social impacts alongside environmental ones.

- **Western Med MAP:** the MAP has led to some positive trends in fish stock recovery, though with some negative economic effects in the short term according to the stakeholder's perception.

## 6. References

- Carpenter, G., Carvalho, N., Guillen, J., Prellezo, R., Villasante, S., Andersen, J. L., Mravlje, E. A., Berkenhagen, J., Brigaudeau, C., Burke, B., Santos, A. C., Cano, S., Contini, F., Da-Rocha, J. M., Davidjuka, I., Martínez, F. M. F., Fontaneda-López, I., Gambino, M., ... Zhelev, K. 2023. The economic performance of the EU fishing fleet during the COVID-19 pandemic. *Aquatic Living Resources*, 36(2), Article 2. <https://doi.org/10.1051/alr/2022022>
- Damalas D., Ligas A., Tsagarakis K., Vassilopoulou V., Stergiou K., Kallianiotis A., Sbrana M., Maynou F., 2018. The “discard problem” in Mediterranean fisheries, in the face of the European Union landing obligation: the case of bottom trawl fishery and implications for management. *Mediterranean Marine Science*, 0,459-476. doi:<http://dx.doi.org/10.12681/mms.14195>
- FAO (Food and Agriculture Organization). 2023. The State of Mediterranean and Black Sea Fisheries 2023 – Special edition. General Fisheries Commission for the Mediterranean. Rome. <https://doi.org/10.4060/cc8888en>.
- GFCM (General Fisheries Commission for the Mediterranean), 2024a. Subregional Committee for the Western Mediterranean (SRC-WM). Rome, Italy, 21–24 May 2024. Final Report, 116 pp.
- GFCM (General Fisheries Commission for the Mediterranean), 2024b. Working Group on Fishing Technology (WGFiT). Rome, Italy, 15 April 2024. Final Report, 27 pp.
- Maynou F., Vitale S., Giusto G.B., Fousti A., Rangel M., Rainha R., Erzini K., Gonçalves J.M.S., Bentes L., Viva C., Sartor P., De Carlo F., Rossetti I., Christou M., Stergiou K., Maravelias C.D., Damalas D., 2018. Fishers' perceptions of the European Union discards ban: perspective from south European fisheries. *Mar. Pol.*, 87: 147-153. 10.1016/j.marpol.2017.12.019
- Sabatella R.F., Accadia P., Gambino M., Malvarosa L., Sabatella E.C. (2021) Impatti economici e sociali delle misure gestionali introdotte dal regolamento (UE) 2019/1022 che istituisce un piano pluriennale per le attività di pesca che sfruttano gli stock demersali nel Mar Mediterraneo occidentale. DOI:10.13140/RG.2.2.25090.18885
- Sola I., Maynou F., Sánchez-Lizaso J. L., 2020. Bioeconomic Analysis of the EU Multiannual Management Plan for Demersal Fisheries in the Western Mediterranean. Spanish Fisheries as a Case Study, *Frontiers in Marine Science*, vol.7, 2020, doi10.3389/fmars.2020.00459, ISSN=2296-7745
- Spedicato M.T., Sánchez-Lizaso J.L., Sabatella E.C., Tsagarakis K., Sartor P., Lembo G., 2022. Synthesis of the Landing Obligation Measures and Discard Rates for the Mediterranean and the Black Sea (Acronym MedBLand). Final Report. Publications Office of the European Union, Luxembourg, 2022, ISBN 978-92-95225-55-8, doi: 10.2926/237700, HZ-07-22-550-EN-N.
- STECF (Scientific, Technical and Economic Committee for Fisheries), 2023. Evaluation of Joint Recommendations on the landing obligation and on Technical Measures Regulation (STECF-23-04 & 23-06). Rihan D., Grati F., Ligas A., Doerner H., Vasilakopoulos P. (eds.). Publications Office of the European Union, Luxemburg, 2024, <https://data.europa.eu/doi/10.2760/447445>, JRC136341



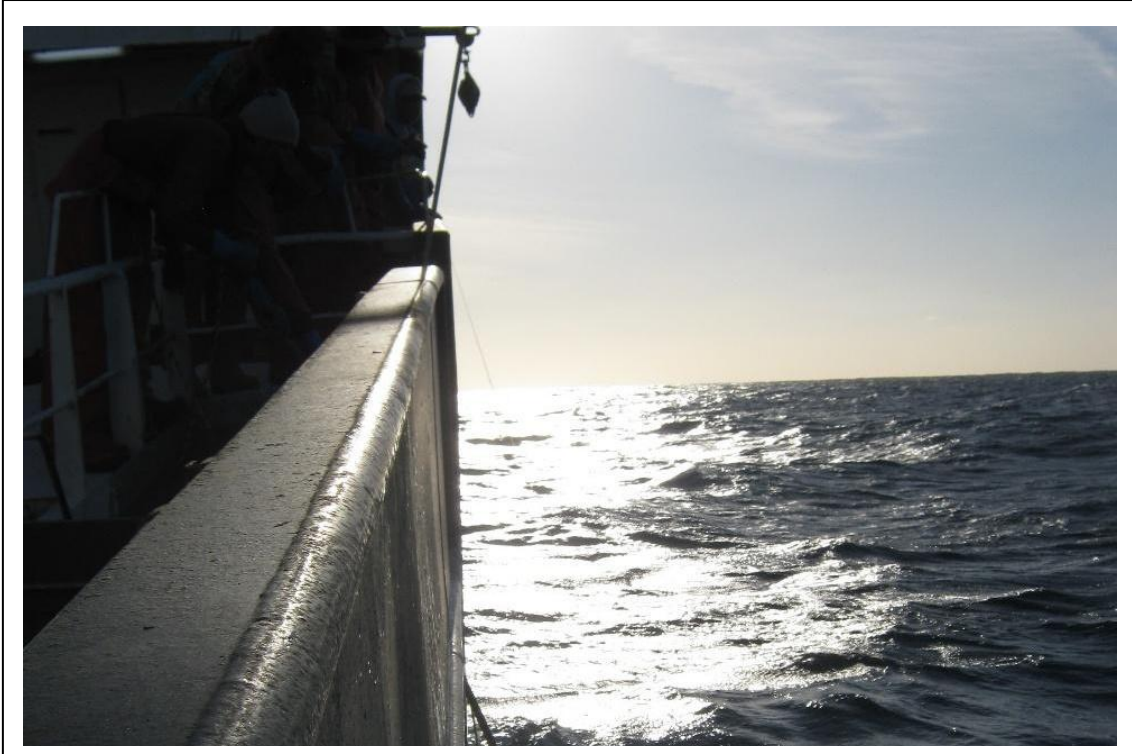
- STECF (Scientific, Technical and Economic Committee for Fisheries), 2024a. Monitoring the Performance of the Common Fisheries Policy (STECF-Adhoc-24-01), GRAS, M., PIERUCCI, A., MANTOPOULOU PALOUKA, D., KUPSCHUS, S. and KONRAD, C. editor(s), Publications Office of the European Union, Luxembourg, 2024, doi:10.2760/547228, JRC137731.
- STECF (Scientific, Technical and Economic Committee for Fisheries), 2024b. 75th Plenary Report (STECF-PLEN-24-01), RIHAN, D. and DOERNER, H. editor(s), Publications Office of the European Union, Luxembourg, 2024, doi:10.2760/82418, JRC137730.
- STECF (Scientific, Technical and Economic Committee for Fisheries), 2024c. The 2024 Annual Economic Report on the EU Fishing Fleet (STECF-24-03 & STECF-24-07), Prellezo, R., Sabatella, E.C., Virtanen, J., Tardy Martorell, M., and Guillen, J. editor(s), Publications Office of the European Union, Luxembourg, 2024, <https://data.europa.eu/doi/10.2760/5037826>, JRC139642.
- Winker H., Pacoureaux N., Sherley R.B. (2019) JARA: 'Just Another Red-List Assessment'. BioRxiv, p. 672899.



## Appendix 1: Stakeholder questionnaire

| Case Study 1: Western Mediterranean Sea |                                                                                                                                                                                                                     |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.                                      | What are the <b>main drivers</b> behind reported changes in fleets <b>in balance</b> or <b>out of balance</b> over the <b>past 5 years</b> ?                                                                        |
| 2.                                      | What are the <b>causes</b> of the <b>current</b> fleets <b>in balance</b> or <b>out of balance</b> situation (e.g. resources status, fisheries management measures, markets, BREXIT, EMFAF)?                        |
| 3.                                      | What <b>current management decisions</b> have been adopted to <b>maintain</b> the fleet <b>in balance</b> (e.g. reduction of fishing capacity, flexibility in quota management, financial support, SWAPs)?          |
| 4.                                      | Is the <b>permanent cessation program</b> effective at managing fleet balance? What are other solutions and why could these be effective?                                                                           |
| 5.                                      | What is causing <b>inactivity in the fleets</b> and what management measures can be used to mitigate this?                                                                                                          |
| 6.                                      | What <b>future opportunities and management measures</b> can be used to improve implementation of fleet balance indicators and how?                                                                                 |
| 7.                                      | Specifically, what has been the <b>impact of the Western Mediterranean Multiannual Plan (MAP)</b> on the fleets in terms of sustainability of fisheries and stocks, viability of the fleets, and fleet performance? |

## 2.2 Case Study 2: Portuguese fleets in the external waters



© Carlos Barbosa (IPMA)

*Ana Cláudia Fernandes, Rui Coelho, João Pereira*  
*IPMA - Portuguese Institute of the Sea and Atmosphere*

## 7. Background

Portugal has an active pelagic longline fleet, with vessels licensed and active on all oceans, that operate under the purview of the respective tuna Regional Fisheries Management Organizations (t-RFMOs), specifically ICCAT in the Atlantic, IOTC in the Indian Ocean, WCPFC in the West and Central Pacific, and IATTC in the Eastern Pacific. Most of this fleet is active in the Atlantic and operates under ICCAT, but some vessels are active in the other oceans.

In the Atlantic, the Portuguese pelagic longline fishery started in the late 1970s. The fleet initially operated and started to develop in the North Atlantic especially after 1986, while in the South Atlantic it gained importance after 1989 (Santos et al., 2001).

The situation of imbalance has not been recognized for long. However, a cascade of administrative steps had to continuously be taken to prevent a collapse of the fishing fleet, which is why we consider that it is in a state of “continuous rescue from imbalance”.

Initially, the fishery was managed through a “first come first serve” system, in which all interested vessels competed for access to the quota. By 1997, a first legal document (Portaria n.º 1221-A/97, of the 5<sup>th</sup> December) was issued granting access to the quota to a restricted number of vessels whose sales of swordfish amounted to at least 30% of the total landing volume in the previous 3 years. In 2002, the external Portuguese bottom longliners that operated in Morocco had to deal with the non-renewal of the EU/Morocco Fisheries Agreement, with severe impacts in the fleet and crews that operated under that Agreement, and particularly severely in some fishing communities that were more exposed. As a response, Portaria n.º 34/2002, of the 9<sup>th</sup> January, was issued, granting this fleet access to the swordfish quota. To make the system more equitable, each vessel was assigned an individual quota. Even with this provision, this act can be considered determinant of the permanent state of potential imbalance that ensued, as a result of the large number of additional players that were included, out of proportion with the previous quota uptake.

In 2004, a decision was made (Portaria n.º 898/2004, of the 22<sup>nd</sup> July) to compartmentalize sub-quotas of the total Portuguese quota, to account for the differential rate of uptake of the different fleet components and shield the continental (larger fleet) from some better equipped vessels registered in the archipelagos of the Azores and Madeira. This would allow each administrative region to close the fishery locally, without a national impact.

However, by 2007 it was evident that the quota was generally insufficient to allow any fleet segment to operate smoothly. And therefore, a new legal document was published (Portaria n.º 1466/2007, of the 15<sup>th</sup> November), aiming to establish measures to redirect the activity of the fleets from the North Atlantic to the South Atlantic, in order to reduce pressure on swordfish (and some tuna), and

encourage a better use of stocks traditionally less exploited by the Portuguese fleet, and for which Portugal had fishing quotas.

Realizing that the system of quotas established was largely unmanageable due to the multiplication of individual circumstances that required action from the managing authorities, a system of Individual Transferable Quotas (ITQ) was created in 2013 (Portaria n.º 90/2013, of the 28<sup>th</sup> February), establishing a mechanism for the transfer of quotas, in some cases managed by an association of vessels, through the annual registration of interested associations.

Finally, in 2022, a new legislation was passed (Portaria n.º 237/2022, of the 14<sup>th</sup> September), establishing further flexibility for the quota management, whereby the ITQ system is improved, allowing the transfer of individual quotas, subject only to an electronic logging system, and including an intra-producer organisation discretionary quota allocation competence.

In spite of the cascade of legislation, quota availability for the EU Northern Atlantic waters is always insufficient in relation to the requirements of the fleet operating in this area, determining reactionary high-level political negotiations to achieve bilaterally agreeable swaps. On the contrary, the quota for the fleet operating in areas external to EU waters, remains under-utilised.

## 7.1. Overview of fleet capacity

### 7.1.1. Overview of Fleet Capacity and Fishing Opportunities

Based on the combined application of biological, economic, and activity indicators, the longline fishing segment (HOK) for vessels over 12 metres in length presents several challenges. The vulnerabilities are particularly significant for vessels over 24 metres in overall length, as these require more labour and have a lower catch capacity, making them especially unprofitable.

One specific sub-segment of this fleet is surface longliners, which primarily target swordfish. However, their allocated quota remains insufficient to maintain regular operations throughout the year. Due to these concerns, Portugal has been closely monitoring these fleet segments, implementing temporary cessation measures in 2023, along with a permanent cessation scheme for fishing activities (DGRM, 2023).

### 7.1.2. Performance of Line and Hook (HOK) Fleet Segments

For vessels operating with lines and hooks (HOK), the utilisation rate (VUR) has deteriorated for vessels of 18- 24 metres in length. Conversely, the 24-40-metre class has seen slight improvements, although overall performance remains unsatisfactory. Portugal has placed special focus on monitoring vessels over 12 metres, implementing adjustments to better align fleet capacity with available resources. These measures include ongoing permanent vessel decommissioning, as outlined in the 2023 Action Plan from the 2022 Annual Fleet

Report, as well as temporary immobilisation of the licensed fleet with swordfish quotas for the northern stock in 2023 (DGRM, 2024).

For fleets operating exclusively outside European Union waters, activity ratios have generally declined in recent years. The HOK VL40XX segment, operating in other fishing regions (OFR), has particularly stood out with an activity ratio of 0.70 (DGRM, 2023).

#### 7.1.3. Economic Viability and Structural Overcapacity

The longline fleet operating in mainland Portugal, Madeira, and external waters beyond the EU has faced persistent economic difficulties, reporting low or even negative returns in recent years. Many vessels in this segment have struggled to generate sufficient revenue to cover both operational and capital costs (STECF, 2024).

Despite these financial challenges, an analysis of vessel utilisation, biological sustainability, and economic indicators suggests that, as a whole, the Portuguese fleet is relatively balanced with its fishing opportunities. However, when focusing on vessels exceeding 18 metres in length operating HOK in mainland and external waters, the economic indicators point to structural overcapacity, indicating that the current fleet size does not align with sustainable profitability (STECF, 2024).

#### 7.1.4. Fleet Adjustment Measures

To address the above-mentioned concerns, Portugal has implemented an action plan aimed at adjusting fleet capacity. This plan builds upon the 2021 strategy and focuses particularly on reducing the number of larger vessels operating with hooks. The strategy includes both permanent and temporary cessation measures to ensure a better alignment between fleet capacity and available fishing resources.

##### Permanent Cessation

The action plan outlines the permanent cessation of 16 vessels, which will either be scrapped or repurposed for non-commercial fishing activities. The vessels targeted for permanent cessation include:

- 9 vessels using bottom and deep-water longlines
- 7 surface longliners targeting swordfish

The focus is primarily on older vessels, as they tend to be less energy-efficient due to outdated engines and hydrodynamic inefficiencies. By removing these vessels from operation, the plan aims to improve fleet efficiency and overall sustainability.

## Temporary Cessation

In addition to permanent vessel reductions, the plan also includes a temporary cessation measure affecting 40 vessels that are licensed to fish for swordfish (northern stock). These vessels will be required to suspend their activities for a period of 45 days, from June to September. This measure is intended to support resource conservation and allow for better management of available quotas.

### 7.1.5. Implementation Timeline and Expected Impact

The action plan is structured with clear targets and timelines. Implementation began in the second half of 2023, with the goal of completing decommissioning by the end of 2025. The total fleet reduction includes 1,330 gross tonnage (GT) and 3,800 kW in propulsion power. These adjustments are expected to bring the fleet more in line with economic sustainability and resource availability while also ensuring compliance with environmental and conservation goals (STECF, 2024).

As a conclusion, the Portuguese longline fleet faces ongoing challenges related to economic viability, quota limitations, and fleet overcapacity. While the government has taken steps to address these issues through a combination of permanent and temporary cessation measures (with a focus on removing older and less efficient vessels from operation), further adjustments and monitoring will be necessary to ensure a sustainable balance between fishing capacity and available resources.

## 7.2. Characterisation of the fleet

The Atlantic fleet can in general be separated in two main components: the "fresh fleet" composed by vessels without freezing capacity that only refrigerate the catch, and usually make shorter trips up to 10-15 sets mainly in the temperate NE Atlantic, and the "freezer fleet" composed by vessels with freezing capacity that make much longer trips, usually with 30-100 sets and operate mostly in the tropical NE, Equatorial and Southern Atlantic (Coelho and Muñoz-Lechuga, 2019). Currently, Portugal has around 90 vessels that are licensed to operate in the Atlantic under ICCAT, and of those, around 50 to 60 are regularly active and operate in this ocean, mostly in the North Atlantic.

The fishery traditionally sets shallow hook sets during the night targeting mainly swordfish (*Xiphias gladius*) and blue shark (*Prionace glauca*). Still, it is a multi-species fishery where some other bony fishes as well as other pelagic sharks are captured. Within the bony fishes, the main catch is swordfish, and the main by-catch are marlins and sailfish, and on some occasions tunas. Sharks are also an important component of the fleet catches, and besides the blue shark that is targeted, other shark species that have also been traditionally an important bycatch include the shortfin mako (Coelho et al. 2012).

In the Indian Ocean, the fleet started later than in the Atlantic, namely in the late 1990s and has mostly been active in the southwest area of the Indian Ocean.

Like in the Atlantic, the fleet traditionally has also targeted swordfish but has increasingly targeted and captured high quantities of sharks, especially blue shark (Coelho et al., 2014). The number of Portuguese vessels that are licensed to operate in the IOTC area have been around 15 vessels in the last years, but the number of vessels that is actually active has decreased substantially in recent years, mainly due to increases in the exploitation costs. In the last few years less than 5 vessels have remained consistently active in the SW Indian Ocean.

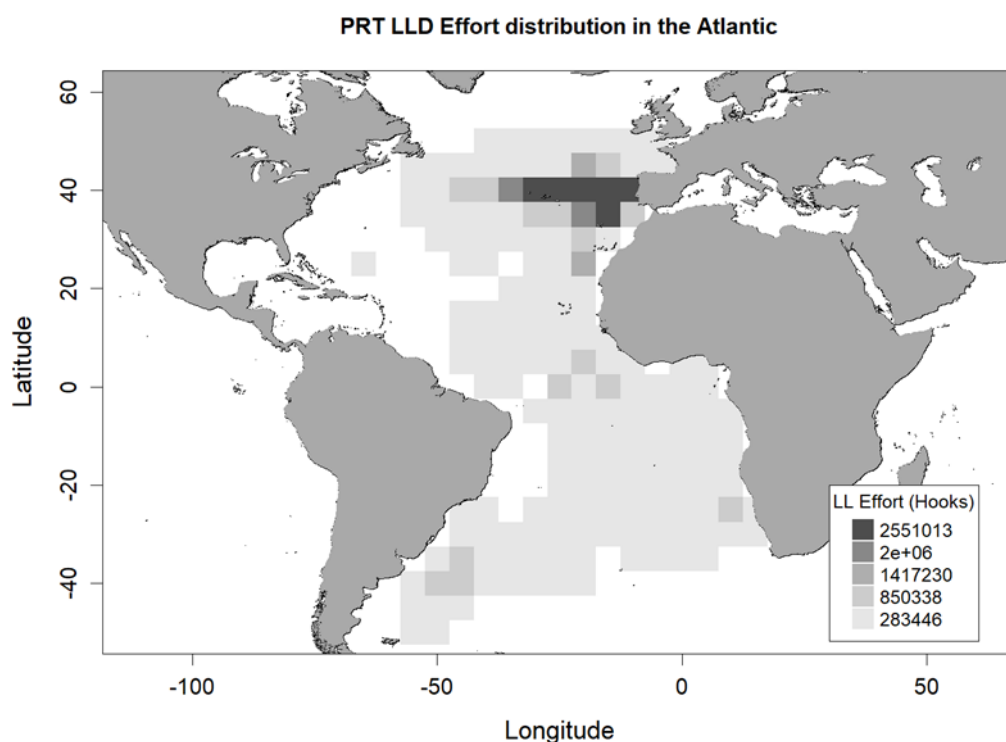
With regards to the Pacific, the presence of Portuguese vessels is more sporadic, even though several vessels have licenses to operate both in the WCPFC and IATTC regions. Like in the Southern Atlantic and Indian Oceans, the vessels that operate in the Pacific are larger freezer vessels, with autonomy to spend long periods of time at sea. Those vessels tend to spend periods of time in one or the other region and can move between them. In the more recent years, the majority of the vessels that are operating in the Pacific have been operating specifically in the IATTC area in the eastern Pacific.

#### 7.2.1. Distribution of effort

The distribution of effort of the Portuguese pelagic longline fleet is mostly carried out in the Atlantic Ocean, and within that mostly in the temperate Northeast Atlantic, given the proximity to Portugal and Spanish mainland, where most of the fleet unloads (Figure 25). Nonetheless, there is also considerable effort spread over the rest of the Atlantic, carried out by larger vessels with autonomy to spend several months at sea, which usually make port and unload the catch in other countries.



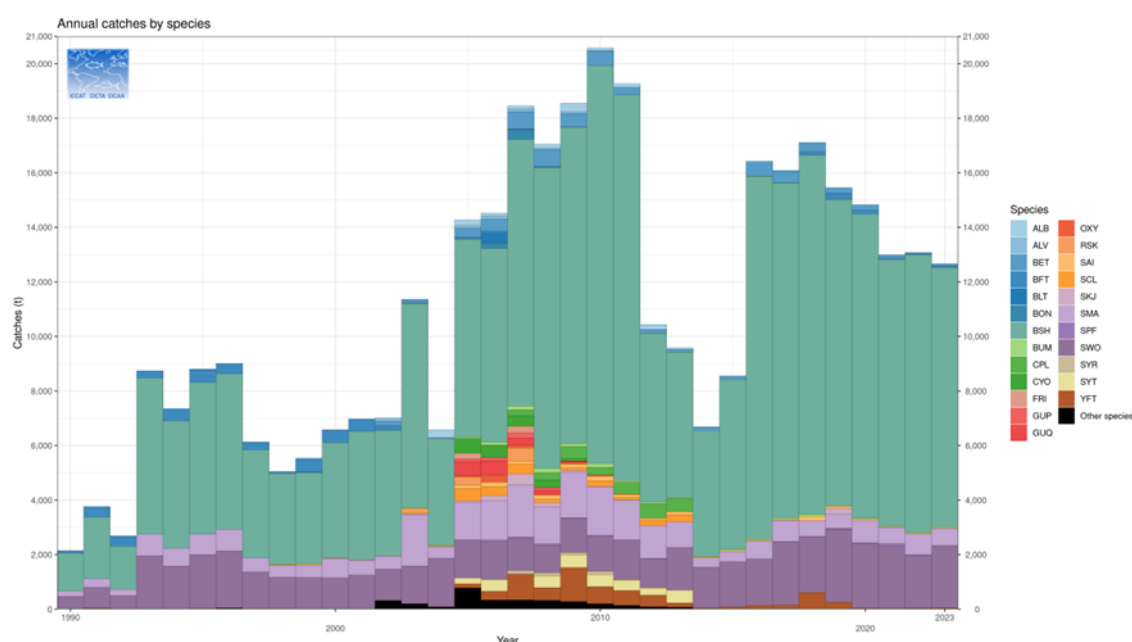
**Figure 25 – Distribution of effort (number of hooks) in 5x5 degrees, by the Portuguese pelagic longline fleet, between 2012-2023**



### 7.2.2. Description of the catches

Traditionally the fleet targets mainly swordfish, even though sharks have also been targeted and valued by this fleet, especially blue shark that is the most abundant of the species. In terms of value the swordfish tends to be more valuable than sharks, even though the prices of shark meat and carcasses have been increasing in recent years. Figure 26 represents the catch composition of the fleet operating in the Atlantic in terms of biomass, where the very high importance of those two species (blue shark and swordfish) is visible. The shortfin mako shark has traditionally been an important bycatch for this fleet, but given the recent catch restrictions, currently this species tends to be discarded. Marlins are also a relatively important bycatch for this fleet especially when operating in more tropical waters, and when captured, tend to be retained due to their value. Finally, a more occasional bycatch but usually also retained due to the value are the tunas, both tropical tunas such as bigeye and yellowfin, and temperate water tunas such as albacore and bluefin.

**Figure 26 – Catch composition (tonnes) of the Portuguese fleet operating in the Atlantic, between 1990 and 2023**



Data source: ICCAT shiny app: [https://iccat.shinyapps.io/T1NC\\_dashboard](https://iccat.shinyapps.io/T1NC_dashboard)

### 7.3. Aims and objectives

This case study was conducted under Specific Contract No.01 “European Union’s fishing fleet: evolution, challenges and future” within the framework contract CINEA/2023/OP/0002. The overall objective of the case studies was to provide an overview of the main trends in regions, fisheries, and fleet segments that appear imbalanced with their fishing opportunities from 2015 onwards. This case study was one out of five EU case studies with structural overcapacity in the fleet/fishery, detailing the factors and barriers that have been an influence on why it has overcapacity or why it could not be addressed. Factors that contribute to successful balances of the capacity may also be identified wherever a balanced fishery is reported.

This “*External fleet*” case study is focused on a very high value target species for a fleet presenting a local and a distant component. Quota management generally follows an ITQ system. Quota are partitioned between administrative regions and individually allocated to each licensed vessel. Management is flexible, and transfers are allowed between any groupings of vessels, or individually, provided the transfer is electronically registered with the national authority. The local component of the fishery tends to permanently be at risk of imbalance, requiring a strong commitment of all stakeholders to secure enough quota availability to correspond to the actual fleet capacity. This is done at the expense of other quota, which are allocated to swaps with Spain, rather than to fishing.

In contrast, quota allocated to the distant fleet is underused, but perceived increases in operational costs are usually blamed for a lack of interest of vessel operators.

This study aims to obtain first-hand perspectives of the stakeholders involved in the operation, assessment and management of the fleets and quota, to provide possible avenues for improvement of the management system, and therefore potentially decrease the risk of imbalance.

## 8. Methodology

### 8.1. General approach

The information presented in this case study is based on recent national and European reports, national legislation overview and scientific literature related to this fleet, in particular. It is complemented with some figures obtained from national data reported to several fishery bodies involved in the assessment of the species that are targeted by this fleet (ICCAT, IOTC, IATTC, WCPFC).

A stakeholder consultation has additionally been performed, through a dedicated questionnaire aimed at collecting feedback on different aspects related to the management of fleet capacity and balance between capacity and resources for this fleet.

### 8.2. Data and information sources

Listed below:

- National legislation
- STECF Balance Capacity EWG reports.
- Fishing fleet capacities national reports <sup>(93)</sup>.
- Scientific literature related to this fleet.
- Data reported to the relevant Fishery Bodies (ICCAT, IOTC, IATTC)

### 8.3. Stakeholder consultation

The identification and selection of the main stakeholders to interview for this case study, was based on their relationship with the Portuguese external fleet, envisioning a good coverage of all the important aspects (economic, social and environmental issues) that may help to understand the state of this fleet in terms of fleet capacity and resource sustainability. They were firstly informed about the project and this specific case study and were invited to participate by answering the questionnaire. All the contacted parties agreed to collaborate in this project. The producer organisations were asked to invite some associated vessel owners/masters to contribute to this case study. There was also a good participation by this group in the interviews.

---

<sup>(93)</sup> [https://oceans-and-fisheries.ec.europa.eu/fisheries/rules/fishing-fleet-capacities/fleet-capacity-reports-2023\\_en](https://oceans-and-fisheries.ec.europa.eu/fisheries/rules/fishing-fleet-capacities/fleet-capacity-reports-2023_en)

The 4 different groups of stakeholders are listed in Table 36. They include: five national authorities (4 mainland, 1 Azores), producers' organisations (POs) (6 persons from 3 POs), fishing operators (vessel owners and/or masters) (9) and one non-governmental organisation (2). The interviews were mainly performed in-person but 3 needed to be made through individual web meetings (3), due to logistical constraints.

**Table 36 – List of stakeholder groups considered relevant for this case study and that were contacted to respond to the questionnaire. The number of people by entity, affiliation and their roles is included**

| MS | Entity                  | Affiliation                                                                | Function/role                                                                 |
|----|-------------------------|----------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| PT | National authority      | Direcção Geral de Recursos Naturais, Segurança e Serviços Marítimos (DGRM) | Head of the Department of Planning & Information                              |
| PT |                         |                                                                            | Head of the Division of Fishing Fleets                                        |
| PT |                         |                                                                            | Senior technicians of the Division of Fishing Fleets (2)                      |
| PT | National authority      | Direção Regional das Pescas dos Açores (DRP)                               | Former Regional Director for Fisheries from the Regional Government of Azores |
| PT | Producers Organisations | Cooperativa de Produtores de Peixe do Norte, CRL (VIANAPESCA - OP)         | Delegate + member (2)                                                         |
| PT | Producers Organisations | Cooperativa de Pesca Geral do Centro, CRL (OPCENTRO)                       | President + members (3)                                                       |
| PT | Producers Organisations | Cooperativa dos armadores da Pesca Artesanal, CRL (CAPA)                   | President                                                                     |
| PT | Fishing Operators       | CAPA associated members                                                    | Associated vessel owners and/or Masters (2 mainland, 2 Azores)                |
| PT | Fishing Operators       | OPCENTRO associated members                                                | Associated vessel owners and/or Masters (1 mainland, 1 Azores)                |
| PT | Fishing Operators       | VIANAPESCA associated members                                              | Associated vessel owners and/or Masters (3 mainland)                          |
| PT | NGO                     | World Wide Fund Portugal (WWF-Portugal)                                    | Members (2)                                                                   |

## 9. Results

### 9.1. Stakeholder consultations

The days for the interviews were scheduled through direct contacts with the people that agreed to collaborate. Three different days were used for the in-person interviews. One day for the Portuguese Administration (Lisbon), another day for the POs CAPA and ANOPCERCO (Peniche), and the last one, for the PO VIANAPESCA (Viana do Castelo). The last remaining interviews were conducted through web meetings (3). All the interviews were performed individually by the IPMA staff, to avoid “contamination” in the responses obtained among stakeholders. The acceptance was good, and several associated members (vessel owners and/or masters) of the POs contacted, showed up to the interviews in the days scheduled and demonstrated no reservations to the collaboration. In fact, among the 4 groups contacted to participate, they constitute

the majority of the respondents (Figure 27). Figure 28 shows the number of respondents by entity within each stakeholder group.

**Figure 27 – Representativeness of respondents by stakeholder group**

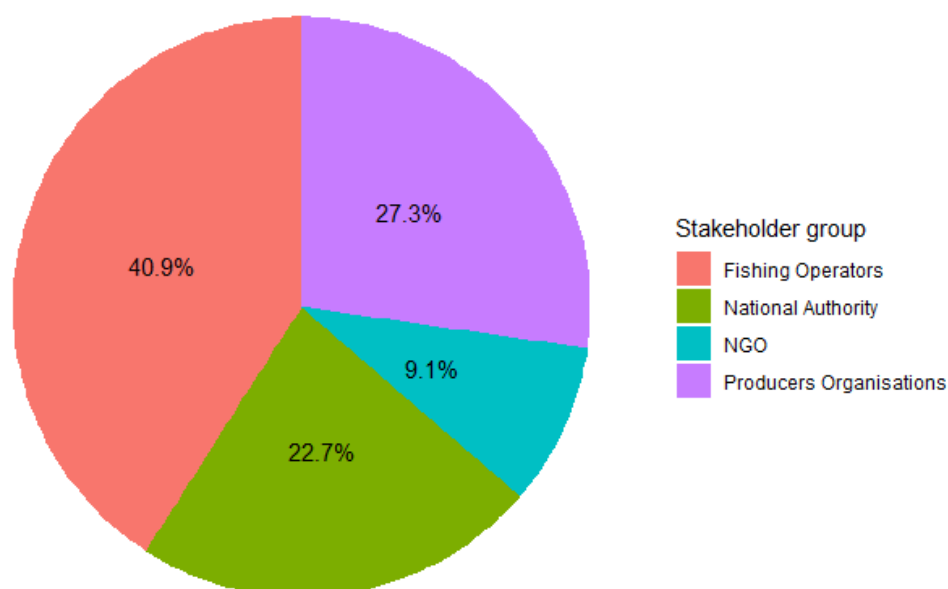


**Figure 28 – Number of respondents, by entity within each stakeholder group**

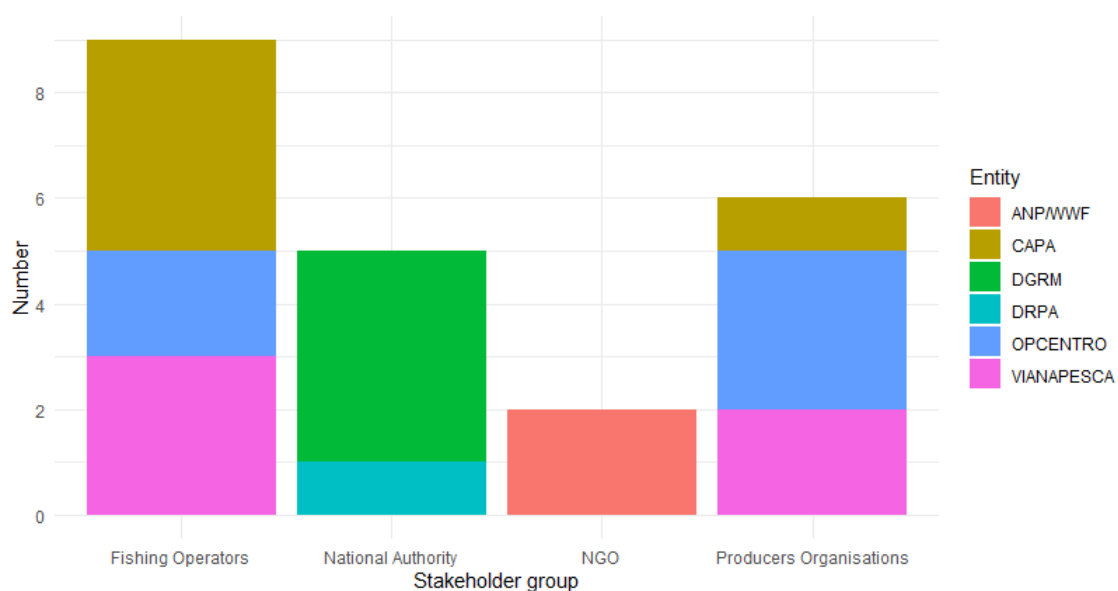


**Table 37 – Summary of some key ideas taken from the responses provided by each stakeholder group by question**

| Question                                                                                                                                                            | National Authorities                                                                                                                                                                                                                                                                                                                                                                                  | Producers Organisations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Fishing Operators                                                                                                                                                                                                                                                                                                                                                                                                                                        | NGO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Q. What are the main drivers behind reported changes in fleets in balance or out of balance over the past 5 years?                                                  | <ul style="list-style-type: none"> <li>· High production costs and resource scarcity lower fleet profitability.</li> <li>· Crew shortages and an ageing fleet hinder balance and renewal.</li> <li>· Ageing vessels and reliance on the domestic market hurt economic viability.</li> <li>· Limited support for new construction and need for better EU planning and data.</li> </ul>                 | <ul style="list-style-type: none"> <li>· Portugal faces quota imbalances and lack of exchangeable quotas.</li> <li>· Regional differences create quota issues, especially between the North and South Atlantic.</li> <li>· Quotas are depleted too quickly, hurting small fleets.</li> <li>· Infringements impact the entire fleet's quota.</li> </ul>                                                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>· Portugal faces unfair quota distribution, with political delays hindering swaps.</li> <li>· Resource levels are stable, but fishing effort has increased with more intensive gear use.</li> <li>· Rising production costs and falling fish prices, worsened by illegal fishing, strain the industry.</li> <li>· Unilateral regulations and past quota mismanagement impact current fleet management.</li> </ul> | <ul style="list-style-type: none"> <li>· Climate change, habitat loss, and targeting migratory species harm ecological sustainability and fleet viability.</li> <li>· Technological advancements boost efficiency but risk overexploitation.</li> <li>· Inconsistent regulations and quota management create fleet imbalances.</li> <li>· Political decisions often undermine resource management by ignoring scientific advice.</li> </ul>                                              |
| Q. What are the causes of the current fleets in balance or out of balance situation (e.g. resources status, fisheries management measures, markets, BREXIT, EMFAF)? | <ul style="list-style-type: none"> <li>· Limited resources and quotas, especially in the Azores, affect fleet balance.</li> <li>· High costs, ageing fleet, and crew shortages hinder renewal and sustainability.</li> <li>· Regulatory inefficiencies and lack of EU strategy cause fleet imbalances.</li> <li>· Small-scale fisheries are vulnerable to economic and regulatory changes.</li> </ul> | <ul style="list-style-type: none"> <li>· Mismatch between quotas and stock sizes limit optimal use of fish stocks.</li> <li>· Delays in stock assessments cause inaccurate quotas.</li> <li>· Past policies and Morocco's exit from a fisheries partnership agreement with the EU (SFPA) contribute to imbalances in the Portuguese fleet that were benefiting from this SFPA.</li> <li>· Quota, assessment, and enforcement reforms are needed for sustainability.</li> <li>· Stock assessments need re-evaluation to align with fishers' observations and environmental factors</li> </ul> | <ul style="list-style-type: none"> <li>· Resource stability remains, but fishing effort has increased with new technology.</li> <li>· Quotas are too small for Portugal compared to those of Spain, causing imbalances between both countries.</li> <li>· Rising costs and foreign competition hurt fleet profitability.</li> <li>· ICCAT quotas need reform to reflect actual stock levels and fairness.</li> </ul>                                     | <ul style="list-style-type: none"> <li>· Lack of "ocean literacy" (specific professional training) leads to a gap between traditional and modern fishing practices.</li> <li>· Younger fishermen embrace technology but may overlook its ecological impact.</li> <li>· External crises like COVID-19 and global conflicts raise costs and strain fleet operations.</li> <li>· Subsidies help short-term but may worsen long-term resource pressure by expanding fleet effort.</li> </ul> |
| Q. How has regulatory change influenced fleet operations and profitability?                                                                                         | <ul style="list-style-type: none"> <li>· Permanent cessations reduce fleet capacity to improve profitability.</li> </ul>                                                                                                                                                                                                                                                                              | <ul style="list-style-type: none"> <li>· Permanent cessations are underused due to limited interest and financial support.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>· Payments for temporal cessations are delayed and come with strict restrictions.</li> </ul>                                                                                                                                                                                                                                                                                                                      | <ul style="list-style-type: none"> <li>· Co-management is crucial for involving fishers in decision-making and ensuring sustainability.</li> </ul>                                                                                                                                                                                                                                                                                                                                       |

| Question                                                                                                                              | National Authorities                                                                                                                                                                                                                                                                                                                                                                                | Producers Organisations                                                                                                                                                                                                                                                                                                                                                                                       | Fishing Operators                                                                                                                                                                                                                                                                                                                                                                                                                                                  | NGO                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                       | <ul style="list-style-type: none"> <li>· Temporary cessations, like seasonal bans, help with stock recovery.</li> <li>· Quota allocation based on historical data and regional resistance complicates swaps.</li> <li>· Fleet modernisation and attracting younger workers are critical for sustainability.</li> </ul>                                                                              | <ul style="list-style-type: none"> <li>· Quota swaps are crucial but hindered by limited exchange opportunities.</li> <li>· Tax policies make scrapping less attractive, unlike in Spain.</li> <li>·</li> </ul>                                                                                                                                                                                               | <ul style="list-style-type: none"> <li>· Quotas should be allocated to individual boats for fairer distribution.</li> <li>· Scrapping subsidies are unattractive due to high taxes in Portugal, unlike Spain.</li> <li>· Improve swap mechanisms and redesign quota distribution for better planning.</li> </ul>                                                                                                                                                   | <ul style="list-style-type: none"> <li>· ITQs can create monopolies and should be approached with caution.</li> <li>· Replace subsidies with education on "blue literacy" for responsible fishing.</li> <li>· Strengthen quota management, swaps, and size/weight regulations for resource sustainability.</li> </ul>                                                                                                       |
| Q. Is the permanent cessation program effective at managing fleet balance? What are other solutions and why could these be effective? | <ul style="list-style-type: none"> <li>· Permanent cessation reduces fleet capacity but needs better funding.</li> <li>· Temporary cessations and fleet modernisation support sustainability.</li> <li>· Regional budget limits affect cessation program effectiveness.</li> <li>· Combining cessation with adaptive measures ensures better balance.</li> </ul>                                    | <ul style="list-style-type: none"> <li>· Lack of transparency and data hampers fleet imbalance assessment.</li> <li>· Taxation on scrapping compensation in Portugal reduces program appeal.</li> <li>· Quota redistribution would avoid disadvantaging Portuguese vessels, especially with Spain.</li> <li>· Cessation programs' limited impact requires quota adjustments and better monitoring.</li> </ul> | <ul style="list-style-type: none"> <li>· Permanent cessations can reduce fleet size, increase resources, and improve sustainability.</li> <li>· Financial disincentives and high taxes make the program less attractive in Portugal.</li> <li>· Gear imbalances and high operating costs hinder fleet efficiency and fairness.</li> <li>· Alternatives include direct quota allocation to vessels and increased quotas for sustainability.</li> </ul>              | <ul style="list-style-type: none"> <li>· Scrapping programs risk exploitation for profit.</li> <li>· Ecosystem-based assessments offer better stock management.</li> <li>· Permanent cessations have limited impact on sustainability.</li> <li>· Alternative strategies may improve fleet management.</li> </ul>                                                                                                           |
| Q. What is causing inactivity in the fleets and what management measures can be used to mitigate this?                                | <ul style="list-style-type: none"> <li>· Poor fleet management and outdated vessels contribute to inactivity.</li> <li>· Workforce shortages and infrastructure issues worsen operational challenges.</li> <li>· Quota limitations and difficulties in quota swaps hinder fleet balance.</li> <li>· Resource conservation requires stronger monitoring and stricter fishing regulations.</li> </ul> | <ul style="list-style-type: none"> <li>· Quota shortages limit fishing despite available resources.</li> <li>· Labour shortages and strict retirement rules affect workforce stability.</li> <li>· High operating costs strain fleet profitability.</li> <li>· Flexible management measures, like temporary stoppages and tax-free scrapping, could help.</li> </ul>                                          | <ul style="list-style-type: none"> <li>· Reassess Iberian quota distribution between Spain and Portugal for fairer access to Portugal.</li> <li>· Address labour shortages by simplifying foreign worker certification and attracting younger generations.</li> <li>· Improve fuel subsidies and assess aquaculture's impact on wild-caught fish prices.</li> <li>· Consider fleet reduction, alternative fisheries, and sustainable fishing practices.</li> </ul> | <ul style="list-style-type: none"> <li>· Improve working conditions and wages to attract and retain labour.</li> <li>· Adjust management policies to account for seasonal stock fluctuations and inactivity.</li> <li>· Reassess TACs and quotas to support fleet sustainability and economic viability.</li> <li>· Promote fishery diversification and explore alternative income sources like tourism fishing.</li> </ul> |
| Q. What future opportunities and management measures can be used to improve                                                           | <ul style="list-style-type: none"> <li>· Align fleet balance indicators with specific fleet segments and regions for accuracy.</li> </ul>                                                                                                                                                                                                                                                           | <ul style="list-style-type: none"> <li>· Improve data transparency and involve all stakeholders in decision-making.</li> </ul>                                                                                                                                                                                                                                                                                | <ul style="list-style-type: none"> <li>· Ensure fairer quota distribution and facilitate direct quota swaps between shipowners.</li> </ul>                                                                                                                                                                                                                                                                                                                         | <ul style="list-style-type: none"> <li>· Improve tracking of unreported sales to better understand actual fleet activity.</li> </ul>                                                                                                                                                                                                                                                                                        |



| Question                                                                                                                                                                                                               | National Authorities                                                                                                                                                                                                                                                                                                                                                                                                   | Producers Organisations                                                                                                                                                                                                                                                                                                                                                | Fishing Operators                                                                                                                                                                                                                                                                                                                                                  | NGO                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| implementation of fleet balance indicators and how?                                                                                                                                                                    | <ul style="list-style-type: none"> <li>· Improve data collection by addressing reporting issues and enhancing stock assessments.</li> <li>· Support fleet modernisation through efficient engines, selective gear, and structural modifications.</li> <li>· Enhance working conditions and consider joint management with Spain for better fleet balance.</li> </ul>                                                   | <ul style="list-style-type: none"> <li>· Increase quota allocations and explore joint management with Spain for financial balance.</li> <li>· Address labour shortages by revisiting retirement age policies and supporting workforce stability.</li> <li>· Maximize Portugal's EEZ potential and retain more value from exported fisheries.</li> </ul>                | <ul style="list-style-type: none"> <li>· Simplify bureaucratic processes for hiring, certification recognition, and quota negotiations.</li> <li>· Address rising operational costs and declining sales values to enhance fleet profitability.</li> <li>· Strengthen enforcement of Portugal's EEZ and reduce non-EU fleet access to protect resources.</li> </ul> | <ul style="list-style-type: none"> <li>· Enhance monitoring and surveillance to prevent parallel trade and improve reporting.</li> <li>· Adjust wage structures to encourage transparent financial reporting.</li> <li>· Promote financial literacy among industry leaders to ensure better compliance and worker integration.</li> </ul>                                                                                                |
| Q. How does your country manage the overall capacity ceiling of regulation (EU) 1380/2013? How do you see this compared to the requirement to report in-balance or out-of-balance individual fleet segments to the EU? | <ul style="list-style-type: none"> <li>· Revise EU policies for flexible fleet renewal without reducing capacity.</li> <li>· Update GT/kW-based limits for more effective fleet modernisation.</li> <li>· Introduce fishing day limits based on quota availability.</li> <li>· Update fleet balance indicators and increase financial support for fleet renewal.</li> </ul>                                            | <ul style="list-style-type: none"> <li>· Address high cost and compartmentalisation of quotas and evaluate fleet reduction impacts.</li> <li>· Increase fleet flexibility to manage operational challenges in distant areas.</li> <li>· Explore alternative solutions for older vessels, such as relocation and avoiding scrapping during biological stops.</li> </ul> | No responses.                                                                                                                                                                                                                                                                                                                                                      | <ul style="list-style-type: none"> <li>· Current management is a step forward compared to the "first come first serve" initial arrangement</li> <li>· Swaps can effectively manage large migratory species.</li> </ul>                                                                                                                                                                                                                   |
| Q. Please explain how your country uses the fleet capacity indicators to manage the fleet.                                                                                                                             | <ul style="list-style-type: none"> <li>· Fleet activity is managed for sustainability using key indicators.</li> <li>· Improving fleet indicators through resource management strategies and external support.</li> <li>· Data quality and interpretation need enhancement, addressing confidentiality concerns.</li> <li>· Time series analysis helps identify fleet imbalances and guide decision-making.</li> </ul> | No responses.                                                                                                                                                                                                                                                                                                                                                          | No responses.                                                                                                                                                                                                                                                                                                                                                      | <ul style="list-style-type: none"> <li>· Resource abundance decline affects social impact and technological development.</li> <li>· Data gaps make it difficult to assess socio-economic impacts, especially for departing fishermen.</li> <li>· Quota division concerns grow with increased fishing capacity from technology.</li> <li>· Technological advancements raise the risk of fraud due to easier data manipulation.</li> </ul> |

**Question 1. To your opinion, what are the causes of the current fleets in balance or out of balance situation (e.g. resources status, fisheries management measures, markets, BREXIT, EMFAF)?**

Herein we present a summary of the combined responses given by all stakeholders consulted:

- **Quota management and resource allocation:** What is seen as a major cause of fleet imbalance is inadequate quota allocation, with many fleets unable to fully utilize available resources due to restrictive quota systems. Discrepancies in resource assessments and slow updates to stock evaluations might led to misalignments between actual fish stocks and available quotas. Suggestions include reforms to improve quota management, such as joint allocations between Portugal and Spain or per-vessel quota systems.
- **Economic constraints and market conditions:** Rising production costs (fuel, maintenance, and materials), along with the impact of external economic crises like COVID-19, are seen to have worsened fleet imbalances. Additionally, competition from frozen fish imports, particularly from Morocco, has affected market prices. Economic pressures are compounded by a lack of financial autonomy for vessel owners, hindering fleet renewal.
- **Workforce and technological challenges:** Crew shortages, particularly due to foreign workers seeking opportunities elsewhere, have strained fleet operations. The fleet also faces difficulties due to an aging workforce and outdated vessels. While technological advancements have increased efficiency, they have also intensified fishing pressure on resources. Balancing traditional and modern fishing practices would be necessary for sustainability.
- **Policy and regulatory issues:** EU policies, particularly in quota management and fleet regulation, are seen as contributing to imbalances, with some stakeholders advocating for more flexible quota-sharing mechanisms. The perceived lack of a strategic EU plan for fleet sustainability and the possible misalignment of quotas with actual resource availability would exacerbate the situation. Additionally, political decisions, including those related to ex-Morocco's fleet entry, may have added complexity to resource management.
- **External factors and long-term strategies:** While Brexit is seen to have had minimal direct impact on Portugal's fleet, external factors like geopolitical crises and global market shifts may have influenced fleet balance. The long-term effectiveness of subsidies (e.g., EMFAF) is

questioned, as they provide short-term relief but may increase fishing effort in the long run, worsening resource pressure.

**Question 2. To your knowledge, what current management decisions have been adopted to maintain the fleet in balance (e.g. reduction of fishing capacity, flexibility in quota management, financial support, SWAPs)?**

Herein we present a summary of the combined responses given by all stakeholders consulted:

- **Fleet capacity and effort control:** Regulatory measures like permanent cessations (scrapping) and temporary closures aim to reduce fleet capacity and promote sustainable resource management. However, limited financial support and taxation on scrapping subsidies, particularly in Portugal, discourage permanent fleet reduction. Temporary cessation support stock recovery but are hindered by strict rules and delayed payments, placing financial pressure on fishers. For these measures to be effective, improved financial and policy support is essential.
- **Quota management and flexibility:** Quota distribution and flexibility are key to fleet sustainability. While quota swaps help optimize resource use, they face political and regional resistance. Allocating quotas to individual vessels is viewed as a fairer, more effective approach. Greater support for cross-country and regional quota swaps is needed to enhance efficiency.
- **Economic pressures and taxation:** Rising production costs (fuel, bait) and falling fish prices are hurting profitability, especially for small-scale fisheries. In Portugal, taxed scrapping subsidies—unlike in Spain—make fleet reduction less appealing. Revising tax policies could boost participation in these programs.
- **Sustainability and co-management:** Co-management that includes fishers and stakeholders is vital for long-term sustainability. Some prefer support through education and responsibility ("blue literacy") over direct subsidies. Effective regulatory measures—like minimum size, weight restrictions and improved quota management—are key to protecting stocks and maintaining profitability.

**Question 3. To your opinion, is the permanent cessation program effective at managing fleet balance? What are other solutions and why could these be effective?**

Herein we present a summary of the combined responses given by all stakeholders consulted:

The permanent cessation program is viewed by some as an effective tool for managing fleet balance, but its overall effectiveness is contingent on various factors, including financial incentives, transparency, and complementary measures. Many stakeholders would agree that the permanent cessation program helps reduce fleet capacity and align it with available quotas, particularly for fleets with excess capacity. However, its success is seen as being hindered by insufficient compensation for shipowners and regional discrepancies, such as in the Azores, where the fleet is not seen as imbalanced, limiting access to cessation measures.

**Challenges to effectiveness:**

- **Financial disincentives:** In Portugal, the taxation of vessel scrapping compensation has likely made the program less attractive compared to Spain, where scrapping premiums are tax-free. Additionally, quota imbalances, particularly in Portugal, remain a significant issue, with some arguing that permanent cessations will not be effective without proper quota redistribution and adjustments.
- **Quota distribution:** The current quota distribution, especially with respect to cross-border landings between Portugal and Spain, is viewed as unfair. Portuguese vessels are seen at a disadvantage, with some landings being attributed to Spanish quotas. Additionally, Spain may have had little interest in swapping quotas for the species Portugal has to offer, which limits the potential for a more balanced quota.
- **Misuse of the program:** There are concerns about the exploitation of the cessation program by individuals who purchase vessels solely to scrap them for financial gain, rather than reducing fleet capacity to improve resource sustainability.

**Alternative measures suggested to manage fleet balance:**

- **Temporary cessation:** Some stakeholders suggest that temporary cessations could be more effective if extended in duration and supported by financial aid. This approach is seen to possibly provide flexibility without permanently removing vessels from the fleet.

- **Fleet modernisation:** Investments in modernizing fleets by upgrading vessels with better working conditions, safety equipment, and modern technology could address inefficiencies in the fleet, improving long-term economic viability.
- **Offer financial support:** Providing additional financial support to offset operating costs, such as fuel and maintenance, could alleviate the financial pressures that fleets face, especially those that are seen as struggling to remain competitive due to their high operational costs. However, in some occasions such a support is also seen as supporting an oversized fleet.
- **Improved quota management:** The request for a more equitable quota distribution, including direct allocation to licensed vessels rather than countries, is seen as a possibility to ensure that quotas are more evenly distributed. Some stakeholders also propose testing a "year zero" without quotas to reassess fleet balance accurately.
- **Conservation and technical management measures:** Complementary conservation measures such as marine reserves, biological pauses, and regulations on minimum sizes could be implemented alongside permanent cessations as seen as possible solutions to maintain sustainable resource use and prevent overfishing.
- **Enhanced monitoring and data collection:** It is suggested that real-time stock assessments, if possible, and onboard observer programs could help provide more accurate data on resource availability and fleet balance. Ensuring that all vessels are equipped with onboard observers could improve compliance and data collection, supporting better decision-making. Economic and exploitation data are not of quality parity, which distorts balance perception. Access to official economic (tax related) data, would help.
- **Ecosystem-based management:** Moving beyond permanent cessations, some propose adopting an ecosystem-based management approach that integrates the management of fish stocks with broader environmental factors. If possible, such an holistic approach could ensure more sustainable fishing practices and better long-term fleet balance.

#### **Regional considerations and challenges:**

- **Economic pressures:** High operating costs, such as expensive fuel, port taxes, and specialized maintenance, continue to make fleet operations increasingly unaffordable at current levels of input used, particularly for small-scale operators. For certain stakeholders, this reinforces the need for comprehensive financial support seen as a mean to keep the fleet active.

- **Technological solutions:** Technological innovations for making the fleet more efficient and reduce operational costs would include more fuel-efficient equipment and are seen as helpers to mitigate some of the financial pressures and improve fleet viability, while it is foreseen that this may require changes to the EU fleet management.

**Question 4. How does your country manage the overall capacity ceiling of regulation (EU) 1380/2013? How do you see this compared to the requirement to report in-balance or out-of-balance individual fleet segments to the EU?**

Portugal follows the guidelines set by the Common Fisheries Policy (CFP) and complies with the overall capacity ceiling established by Regulation (EU) 1380/2013. The primary objective is to ensure that the national fleet does not exceed the established capacity limits. To achieve this, stakeholders reported that Portugal employs a variety of strategies that manage fleet renewal, capacity balance, and compliance with EU regulations.

- **Fleet renewal and capacity limits:** The "One-in, One-out" rule requires an older vessel to exit the fleet when a new one enters, maintaining the fleet's capacity within regulated limits as stipulated by the CFP entry/exit scheme. Scrapping vessels with public aid results in permanent capacity loss, which is seen by some as hindering fleet modernisation. Quotas are managed per vessel, with the option for some collective management, both arrangements seen as helping balance fishing activity and support fleet modernisation.
- **Challenges with capacity indicators:** The GT/kW measurement system is seen as ineffective for guiding scrapping and fleet renewal, as it would not fully reflect fleet efficiency or modernisation needs. Current capacity balance indicators are seen as misfit and Portugal will complement them in 2025 to better capture fleet segment dynamics. Additionally, new fishing day limits may be introduced based on resource availability, potentially impacting fleet capacity management and aligning with sustainable fishing practices.
- **Financial support and temporary cessations:** Portugal uses financial support mechanisms like the EMFAF for fleet management, but the support is often considered insufficient. Temporary cessation measures are available year-round to help maintain fleet balance, but they may not be enough for long-term sustainability and fleet renewal.
- **Selective scrapping and kW management:** Fleet capacity is managed through selective scrapping and engine power management regulations, allowing a small variation (up to 10%) in declared power based on manufacturer declarations. However, vessel power is not measured

regionally, which can result in discrepancies between reported and actual power.

- **Quota management and economic pressures:** Stakeholders believe that Portugal faces financial pressure due to the high cost of quotas, especially for high-value species, affecting decisions on fleet reduction or modernisation. There is also a need to improve quota compartmentalisation and increase quotas for species like bluefin tuna to support sustainable resource use.
- **Comparison with the reporting of fleet segments:** Stakeholders believe there is a need for more accurate fleet segment reporting to better align with capacity limits, as current indicators would not fully capture the nuances of different segments. This makes it hard to assess if the fleet is within capacity. The 2025 revision of capacity indicators aims to address these issues by providing more detailed insights into individual segments, updating indicators to reflect specific fleet operations, and ensuring accurate reporting of fishing activities and capacity compliance.

#### **Question 5. Please explain how your country uses the fleet capacity indicators to manage the fleet.**

Stakeholders reported that Portugal uses fleet capacity indicators to manage fleet activity, ensure sustainability, and maintain resource balance, helping optimize fleet size and comply with EU regulations while addressing economic and social challenges in the fishing industry. Here is an overview of their use in fleet management:

- **Fleet activity and resource management:** it is said that fleet capacity indicators in Portugal focus on sustainability by monitoring activity levels to prevent overfishing and protect marine resources. The indicators are said to guiding decisions on fishing effort, quotas, and fleet size to ensure the long-term health of fish stocks.
- **Improving fleet indicators:** Fleet capacity indicators are integral to resource management strategies like quota systems and quota swap programs (SWAPs), which help adjust fleet composition for sustainability. It is said they also guide decisions on fuel and production support, responding to external factors like rising fuel costs, such as those caused by the war in Ukraine, that impact fleet performance.
- **Data quality challenges:** Some mention that a key challenge with fleet capacity indicators is ensuring data quality, particularly concerning economic statistics. More accurate data are needed, including addressing confidentiality concerns that may limit data sharing among state agencies.
- **Fleet balance and licence management:** Fleet capacity indicators could guide corrective actions like vessel decommissioning or diversification. Indicators aid in managing fishing licenses, ensuring they align with fleet



capacity and promote environmentally safe practices, such as those used by the surface longline fleet. In the past, adjustments such as the introduction of the individual transferable quota (ITQ) were implemented from the results of previous indicator analysis.

- **Time series analysis and decision-making:** Time series' analysis, especially reviewing 5-year data sets, is seen as helping assess fleet balance and informs decision-making in Portugal for corrective actions like adjusting quotas, reallocating licenses, or implementing temporary cessations.

## 10. Discussion

In questioning stakeholders about this case study, we looked for people involved in the fishery, and among which there was first-hand knowledge about the issues faced, regardless of whether they were directly a result of EU policy and European management, or any other problem perceived by the respondents. We also questioned people in their own “turf” and not by e-mail or telephone. We did not train people in the questions presented to them, and we did not allow people to talk among themselves once we started the interviews. Further, the interviews were conducted privately. Yet, we could clearly identify patterns in each group, that must result from discussions they hold among themselves. Most issues that were identified by the respondents can be grouped under similar categories, so we will discuss the broad issues first, and then note differences or deviations from the focus that we noted under each question.

Five main groups of drivers were identified by us from the answers provided:

- a) Economic and market pressures, i.e. financial drivers, which would be aspects including the cost of fuel and bait, ice, etc., and on the flip side, relative product valuation, excluding inflation, which means periods of higher and lower net resource value;
- b) Quota and resource management, i.e. regulatory issues, which are accepted as burdens in a way that bear little resemblance to other types of business ventures, but is not very different from other fisheries, except in some details that will be discussed below;
- c) Workforce and structural issues, i.e. human and material resources, which is a fixed cost in capital terms and a challenging company management issue, that is different in some ways from inshore fisheries but similar to other long-distance fisheries – this has changed with societal evolution and has created more acute issues in recent years when compared to former periods, i.e. it is a perception that is likely to differ with the age of the respondent, even though we did not attempt to resolve any age differences;
- d) Environmental and technological impacts, i.e. external forcing that results from technical evolution and the challenges these create in terms of whether to fish less effectively for a lower return, or invest more in a potentially unpredictable environment vs. a changing natural environment and changing

- societal perceptions of the fishing activity, that result in the need for more demanding adaptations with significant economic implications; and
- e) Regulatory challenges, which may be viewed as regulations not easily accepted or understood – these may derive from a lack of adequate and continuous training, or are a legacy of former experience; i.e. they may also be different between different age-groups. Compliance or the lack of will to understand regulations, or unwillingness to comply, may also derive from cultural aspects that may be quite difficult to change, requiring both continuous and adaptive public commitment.

### Specific questions

Question 1 addresses what the stakeholders may perceive to be drivers of change. In this question they were given a timeframe to base their opinions on. However, we understand the difficulty in limiting the analysis to a specific timeframe, since perception is constructed layer upon layer through an individual's life experience. In addressing the timeframe, we simply relay the objective that it is the most recent experience that may bear the highest relevance. Indeed, an analysis conducted in greater detail could reveal differences between individuals grouped by age or work experience, but we did not attempt to identify such effects, nor did we have a sufficiently large and diverse sample to result in meaningful interpretations. Answers to question 1 came at no particular surprise, as these issues are clearly a part of most business ventures. Contrastingly it is worth noting that in this particular segment, there has been a greater degree of regulatory adaptation than in most, as the fisheries administration has continuously attempted to perfect the quota system. However, while some will be grateful for changes implemented, others will see them as burdens. The management system in use for this fishery has gone from free for all to an ITQ system managed by interest groups. The opinions we obtained clearly derive from such perspectives. The vessels fishing for low quota species are easily able to fulfil quota, and have to close their activity early in the year, while the Spanish quota of the same stock easily outlasts the year. While the Portuguese administration attempt to cover the requirements with swaps, the success of those operations is not guaranteed, since it requires the ability to meet the negotiation counterproposal. Another noted cause is the timing of the assessments under ICCAT, in relation to others (i.e. ICES/COM). Operators feel that quota should be updated at a higher frequency, because they perceive the condition of the stock to change more rapidly than the quota system is able to reflect and regret not being able to take advantage of higher availability when the stock is improving. Of course, the opposite might be a cause for concern as well, and it is not unknown to happen. Regarding quota unavailability, the solution that is most frequently suggested is that rather than allowing quota underutilization, it should be attributed equitably to the vessels exploiting the stocks, regardless of the MS (Spain or Portugal) they belong to. This is obviously the position of those on the receiving end, but nonetheless arguments follow along the FAO promotion of food security and nutrition, while ensuring sustainability<sup>[2]</sup>. The answers here also introduced important issues that have been hampering a safe operation of

the companies involved in this fishery segment either in EU waters or in distant fishing grounds: crew shortages are a common feature of the industry in modern times, however they are more acute in long-distance operations. Additionally international instability results in lower ability for companies to offer competitively priced products (either through unequal taxation or unequal labour costs), as well as limits the willingness to look for alternative fishing grounds. To make use of quota available in fishing areas overseen by unstable countries, means costs are not as easily predictable, and/or there may be significant overheads tied to security.

Issues discussed within the stakeholder consultation meetings highlight the existence of imbalances resulting from continuous moderate negative pressures on profit margins but also failing to provide clear incentives to change the investment strategy of the companies. Such perception is, however, not coherent with the responses to Question 1, where rising production costs are identified, as a reflection of increased competition from imports, disparities in quota distribution, labour shortages, unilateral legislative decisions, among others.

While the root source of the perceived imbalance is identified as a sudden administrative increase of the fleet size in the past, when vessels operating in north Africa were left without an alternative, by failing international agreements, conversely, an international agreement might be effective if the Iberian quota could be managed by the two-nation fleet (ES+PT) allowed to share the quota among current players (companies, not nations). However, given the EU has exclusive competence in terms of fisheries management, including setting TACs, this solution is currently not realistic: quotas are set and managed by the EU and not the nations or companies exploiting the resources. However, as discussed above, the problem could be solved if the EU was more predictive of the way each country is allowed to manage compensations, and did not allow internal practice to bias procedures among different nations.

Question 2 addresses the ways by which the solutions to some of the problems have been approached. When receiving compensation for scrapping, companies are taxed on the full value of the compensation. This is because CAPEX investment in vessels is deducted annually as OPEX, through the expected productive period, and compensation for scrapping becomes near full profit on the year's results. This is different from what Spain understands and means that it is far easier for Spanish operators than for Portuguese operators to accept compensation for scrapping. Only when new investments are needed in aged vessels that have lost near all their operating capability (and resale value) do the operators accept compensation. That is likely the root cause for the imbalances felt in the Portuguese long-line fishery for swordfish. Spain have managed to reduce their fleet to adequate levels through adequate compensations schemes that are seen as fair by Spanish operators. Interestingly, there is a generalized recognition that investment in education and training results in better performance. This is perhaps a point for further consideration in the future.

Looking further afield from the immediate cause, some stakeholders identify the reduction of operational costs as a solution, looking at more effective vessels and

gear as a source of cost reduction, thus providing sufficient returns from current quota. Cost reduction would indeed improve profitability alongside improving working conditions, allowing experienced workers to stay, and attracting younger workers through better and fixed salary are identified as a solution to labour shortage.

Others hypothesize looking at the exploitation of non-traditional sources of income from the sea, such as demonstration fishing for tourism would be a possible compensation for inactivity. Yet others think that allowing a more informed look at fishing through a better empowerment of stakeholders might allow additional cost trimming and the identification of alternative sources of income by the stakeholders.

Question 3 specifically addresses compensation for scrapping, and the issue that is in the mind of all stakeholders was discussed at length. When asked about alternative measures, answers often addressed the issue of the segment attractiveness for available labour, which is approached through the modernization of the fleet. Therefore, better vessels are seen not only as better performers but also as more attractive working environments, that may help to offset labour shortages from two simultaneous angles: better capacity to distribute results and better labour conditions.

Another key aspect was the issue whether imbalance is real or the result of incomplete or wrong data. Indeed, some of the respondents questioned whether the fisheries administration is dealing with a fair appraisal of the operator's capacity to be in balance. The fisheries administration is given access to full landings (and respective sales) data, but costs are not officially sourced and only derive from interviews. This may result in biases that could impact the assessment of balance. Additionally, even if Portugal employ a system of compulsory landing within official sites, there are opportunities for laundering of profits through data manipulation in several ways from species misidentification to unreported sales. These issues are not new to the inspection and control agencies, and they are continuously being tackled, but they may temporarily bias perception. Some stakeholders refer that there may be a misinterpretation of the economic data of the companies as an explanation for the continued investment strategy in an apparently unprofitable enterprise.

Additional suggestions revolve around subjects which are in the toolbox of resource management, including technical fisheries measures and environmental protection measures. Technological solutions are also generally regarded as positive, although they are largely not a specific tool for resource management.

Question 4 relates to the way Portuguese authorities manage the capacity of the fleet.

Fleet capacity has been strictly adhered to in Portugal ever since the Common Fisheries Policy established capacity ceilings applicable to the country.

More recently, the methods applied to limit capacity are under revision, since some, such as hold capacity (tonnage), are not adequately applicable to all segments.

Question 5 aims to assess the way capacity indicators may be useful to manage the fleet.

Capacity indicators need to reflect the reality of the fleet as accurately as is possible but also allow quick action to counteract sources of imbalance.

Over time, it became apparent to managing authorities that two factors have the greatest impact on the accuracy of the indicators and their efficacy as fleet capacity management tools:

- 1) company profitability, which relates to real costs and revenues, both available to fiscal authorities but not to fisheries administrative authorities, and;
- 2) the attractiveness of scrapping schemes or effort reallocation practices, which relate to how the finance ministry implements the relationship between the fisheries authorities and the fishing companies.

Since it is unlikely that fiscal data relating to individual companies will be made available to fisheries authorities, new indicators are being assessed to provide better indirect evidence.

The way to address scrapping attractiveness could involve a greater involvement of the EU in determining methodologies for compensation that would be of direct application in all EU MS, therefore avoiding differences in practice in different MS that are not only unfair, but also create an uneven playing field for the operators in different MS.

The sector advocates for a common management among operators (and not countries) exploiting the same quota. However, if fiscal practices were better matched between countries, fleet balance would likely be achieved far easier, allowing markets to adjust according to profitability and naturally following stock availability, as is the case with other economic activities.

Conclusion and recommendations

By improving fleet capacity indicators and addressing the associated challenges, Portugal can ensure that its fleets remain balanced, sustainable, and resilient in the face of evolving economic and environmental pressures. Even if some diversity exists in the understanding of the issues facing this fleet, most stakeholders address the issues in similar or complementary ways. Few identified solutions relating to the specific case of the external fleet quota. Most vessel owners show a lack of confidence in current international conditions that surround fishing opportunities overseas and therefore do not consider the alternative use of fishing distant waters opportunities as a solution to replace the strained quota in national waters.

The most consensual recommendations can be described through the following list:

- Update capacity indicators: The fleet balance indicators would need to be revised to reflect the complexities of different fleet segments. This includes integrating fishing day limits and segment-specific quotas but also access to official economic and employment indicators.
- Improve quota management with transnational ITQs, rather than quota swaps, as more efficient management and different allocation of quotas, including multinational use of quotas, irrespective of operator flag, would result in a more natural response to resource availability, including resulting in an easier perception of stock status. In parallel, it would consist in addressing alternative quota usage and new sources of income.
- Flexible fleet modernisation: Revising how vessel scrapping program are handled under EU regulations, but also specific programmes to improve vessel energy efficiency, more effective gear, and better working conditions and payment scheme would help in the fleet renewal.
- Training and empowerment of the workforce and increased appropriation of quota by co-management, would help to decrease social and economic impacts of quota shortage and fleet inactivity.

## 11. References

- Coelho R., Fernandez-Carvalho J., Lino P.G. & Santos M.N. 2012. An overview of the hooking mortality of elasmobranchs caught in a swordfish pelagic longline fishery in the Atlantic Ocean. *Aquatic Living Resources*, 25: 311-319.
- Coelho, R., Santos, M.N., Lino, P.G. 2014. Blue shark catches by the Portuguese pelagic longline fleet between 1998-2013 in the Indian Ocean: Catch, effort and standardized CPUE. *IOTC-2014-WPEB10-24*. 32pp.
- Coelho, R., Muñoz-Lechuga, R., 2019. Hooking mortality of swordfish in pelagic longlines: comments on the efficiency of minimum retention sizes. *Rev Fish Biol Fisheries*, 29: 453–463. DOI: <https://doi.org/10.1007/s11160-018-9543-0>
- DGRM, 2023. Annual Report on the Portuguese Fishing Fleet. [https://oceans-and-fisheries.ec.europa.eu/fisheries/rules/fishing-fleet-capacities/fleet-capacity-reports-2023\\_en](https://oceans-and-fisheries.ec.europa.eu/fisheries/rules/fishing-fleet-capacities/fleet-capacity-reports-2023_en)



- [FAO, 2023. Report of the Workshop on Optimizing Food and Nutrition Security and Livelihood Benefits of Small Pelagic Species Production in Sub-Saharan Africa, Accra, Ghana, 5-7 December 2023. FAO Fisheries and Aquaculture Report n.º 1460. Tome \(DOI: 10.4060/cd2489en.\)](#)
- [Halbwachs, Maurice. 1925. Les cadres sociaux de la mémoire. Paris : Librairie Félix](#)
- Portaria n.º 1221-A/97, Diário da República - I Série B, nº281 (5 Dezembro 1997).  
<https://files.diariodarepublica.pt/1s/1997/12/281b01/00020002.pdf>
- Portaria n.º 34/2002, Diário da República - I Série B, nº7 (9 Janeiro 2002).  
<https://files.diariodarepublica.pt/1s/2002/01/007b00/01630165.pdf>
- Portaria n.º 898/2004, Diário da República - I Série B, nº171 (22 Julho 2004).  
<https://files.diariodarepublica.pt/1s/2004/07/171b00/46014603.pdf>
- Portaria n.º 1466/2007, Diário da República - I Série B, nº220 (15 Novembro 2007).  
<https://files.diariodarepublica.pt/1s/2007/11/22000/0850208504.pdf>
- Portaria n.º 90/2013, Diário da República - I Série B, nº42 (28 Fevereiro 2013).  
<https://files.diariodarepublica.pt/1s/2013/02/04200/0116601170.pdf>
- Portaria n.º 237/2022, Diário da República - I Série B, nº178 (14<sup>th</sup> Setembro 2022).  
<https://files.diariodarepublica.pt/1s/2022/09/17800/0001100016.pdf>
- Santos MN, Garcia A, Pereira JG (2001) A historical review of the by-catch from the Portuguese surface long-line swordfish fishery: observations on blue shark (*Prionace glauca*) and short-fin mako (*Isurus oxyrinchus*). *Collect Vol Sci Pap ICCAT*, 54: 1333–1340.
- STECF (Scientific, Technical and Economic Committee for Fisheries), 2024. Assessment of balance indicators for key fleet segments of national reports on Member States efforts to achieve balance between fleet capacity and fishing opportunities (STECF-23-13), Casy, J. and Virtanen, J. editor(s), Publications Office of the European Union, Luxembourg, 2024, <https://data.europa.eu/doi/10.2760/958072>, JRC136331



## 2.3 Case Study 3: Fisheries in the Atlantic North Western Waters



Spanish segments subject to the current Action Plan (2024) © AZTI

*Martin Aranda, Raul Pallezo*

*AZTI*

## 12. Background

Spain has a large fishing fleet comprising 8 908 vessels that operates in three main fishing grounds. These are the North Atlantic Ocean (NAO), comprising the EU waters areas of Grand Sole (ICES subdivisions 6 and 7), Bay of Biscay (ICES 8 a,b,d), Cantabrian sea (ICES 8c), waters of Portugal (ICES 9); and Gulf of Cadiz (ICES 9), the Canary Islands in CECAF area 34.3.2, and Morocco coastal in CECAF area 34.1.1. The other two large fishing regions are the Mediterranean and Black Sea (MBS), and Other Fishing Regions (OFR) that comprise non-EU waters where the Spanish fleet operate, such as areas under the purview of Regional Fisheries Management Organisations (RFMOs) and the third countries' waters. The present report describes the general evolution of fleet balance in the North Atlantic Ocean area in the period 2017 – 2022 and then makes an in-depth analysis of the case of the dredge fleets targeting Venus clam in the Gulf of Cadiz. These comprise two fleet segments included in the current Action Plan, where the national management authority proposes measures to address fleet imbalances and outlines a plan to carry out corrective measures.

### 12.1. Fleet management in Spain

In Spain, the fishing fleet is managed by the General Secretariat for Fisheries of the Ministry of Fisheries, Agriculture and Food (MAPA for its acronym in Spanish). In particular, the management of the fishing fleet is divided between two directorates: the Directorate-General for Fisheries Management and Aquaculture and the Directorate-General for Sustainable Fisheries. The former is the most relevant for this case study and is responsible for fleet planning and management in terms of fishing capacity management; management and maintenance of the General Register of the Fishing Fleet and the Official Register of Fishing Enterprises in Third Countries. The Directorate analyses the balance between fishing capacity and fishing opportunities for the various segments of the fleet, prepares the annual report on the fishing fleet and analyses and evaluates economic data on the fishing sector in order to carry out studies and reports on fishing activity. In addition, this Directorate carries out other activities relevant to the management of the fishing fleet, such as the coordination of actions related to the energy transition in the fishing sector.

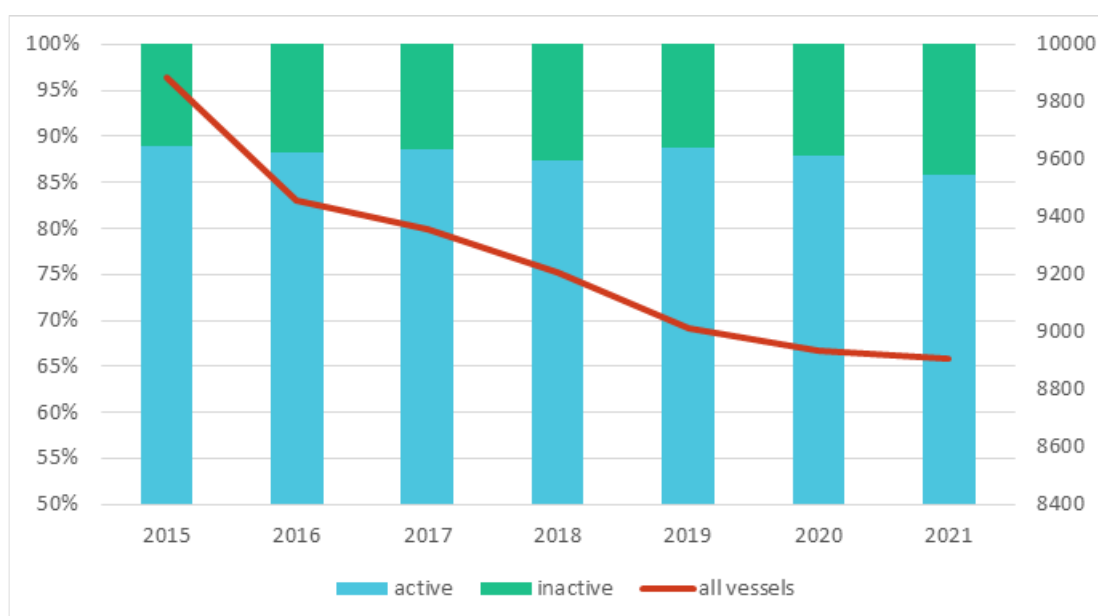
The Directorate-General for Sustainable Fisheries in turn proposes and develops fisheries management plans and measures, including technical measures, closed areas, management of fishing effort, fishing opportunities and their transmission, access to fishing grounds, management of the fleet census and application of the landing obligation. In addition, this Directorate is responsible for the control and management of the fleets operating in international and third country waters, including licensing. Spain is organised politically into Autonomous Communities (AC). These only have powers to manage the professional fleets operating in the

so-called "internal waters"<sup>94</sup> and shellfish harvesting. However, these communities manage the European Maritime and Fisheries Fund (EMFF) when it comes to financing fleet investments and temporary or permanent cessation of fishing activities.

## 12.2. Overview of the national fleet

As of 2021, the Spanish fishing fleet comprises 8 908 vessels, of which 7 650 (85.9%) are active and 1 258 (16.44%) are inactive (Table 38). Between 2015 and 2021 the fleet was reduced in 4.8% in terms of the number of vessels. In this period, the number of active vessels decreased significantly by around 7.8% (Figure 29).

**Figure 29 - Evolution of the active Spanish fishing fleet**



Source: STECF 23-13 (STECF, 2023a).

**Table 38 – Evolution of Spanish fleet size in the three main fishing grounds**

|                | 2017  | 2018  | 2019  | 2020  | 2021  |
|----------------|-------|-------|-------|-------|-------|
| All ES vessels | 9 356 | 9 207 | 9 014 | 8 937 | 8 908 |
| active         | 8 295 | 8 050 | 8 007 | 7 852 | 7 650 |
| inactive       | 1 061 | 1 157 | 1 007 | 1 085 | 1 258 |
| NAO all        | 6 574 | 6 495 | 6 386 | 6 341 | 6 338 |
| NAO active     | 5 868 | 5 764 | 5 723 | 5 604 | 5 444 |
| NAO inactive   | 706   | 731   | 663   | 737   | 894   |
| MBS all        |       |       |       |       |       |

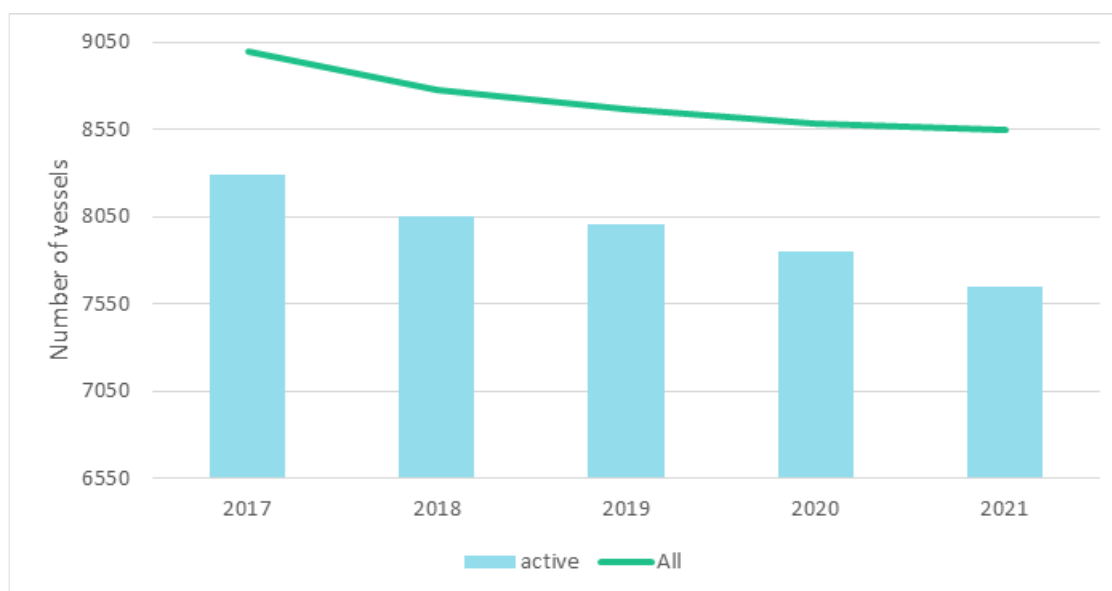
<sup>(94)</sup> Waters enclosed between the coast and an imaginary line that links points of the littoral which extend further into the sea.

|              | 2017  | 2018  | 2019  | 2020  | 2021  |
|--------------|-------|-------|-------|-------|-------|
| MBS active   | 2 228 | 2 092 | 2 079 | 2 048 | 2 011 |
| MBS inactive | 335   | 406   | 322   | 325   | 334   |
| OFR all      |       |       |       |       |       |
| OFR active   | 199   | 194   | 205   | 200   | 195   |
| OFR inactive | 20    | 20    | 22    | 23    | 30    |

Source: STECF 23-13 (STECF, 2023a)

The Spanish fleet operating in the North Atlantic Ocean (NAO) comprises 6 338 vessels. This represents 71.16% of the Spanish fleet in terms of vessels, followed by the Mediterranean fleet (catalogued as part of the wider Mediterranean and Black Sea fleet - MBS) with 26.32% and the Other Fishing Regions (OFR) with 2.52%. The NAO fleet includes 78% of the active Spanish fleet. According to the latest official data published by STECF (2023a), 86% of the Spanish fleet operating in NAO is active. This level of activity is similar to that reported for the MBS (86%) and OFR (87%) Spanish fleets. Over the period 2017 – 2021, the NAO fleet has experienced a decline of 3.6% in the number of total vessels. In contrast, the number of active vessels has decreased around 7.23% (Figure 30). This case study will exclude the Canary Islands and Morocco coastal waters. Hereinafter, the area under study will be referred to as the North Atlantic to be consistent with the nomenclature used by MAPA. The North Atlantic fleet consists of 5 592 vessels, of which 4 842 (86.8%) are active and 740 (12.2%) are inactive.

**Figure 30 - Evolution of the active Spanish fishing fleet in the NAO region**



Source: STECF 23-13 (STECF, 2023a)

### 12.3. Aims and objectives

The general objective of this case study is to examine the evolution of the fleet balance of the Spanish fishing fleets operating in the North Atlantic region, which includes national and EU waters in ICES areas 6, 7, 8 and 9, in the period 2018 – 2022. Nevertheless, the main objective is to look in more detail at the segments subject to the current Action Plan (2024) i.e. dredge fleet targeting Venus clam in the Gulf of Cadiz and to identify the causes of these imbalances, the measures proposed by the Member State to bring fleet capacity into line with fishing opportunities in these segments and, where information is available, to review the results of these measures.

## 13. Methodology

### 13.1. General approach

This case study is based on the analysis of the balance situation of the Spanish fleet in the North Atlantic. To this end, official data and information sources (see Section 13.2) on fleet balance have been used to analyse the evolution of the concerned fleets in the period 2018 – 2022. The aim was to identify the fleets that were either consistently in balance or out of balance for all or most indicators throughout the period. It then looks at the evolution of the biological, economic and technical indicators to identify those that show recurring positive and negative balance assessments and to briefly identify the causes of these trends. Finally, the study focuses on the fleet segments that are currently in the Action Plan 2024 (MAPA, 2024) proposed by the Fisheries Secretariat of the Ministry of Agriculture, Fisheries and Food (MAPA) due to their persistent imbalance. It then examines the causes of the imbalance situation and management measures developed by MAPA to address the imbalance situation.

### 13.2. Data and information sources

The case study is based on data and information from the fleet activity reports and Action Plans published by MAPA; the STECF balance report (STECF, 2023a), annual economic reports (STECF, 2023b), and associated data; and the results of the stakeholder survey. Scientific studies published by the IEO and commissioned by Spanish and regional authorities, as well as scientific literature, were also reviewed. National and regional regulations were also consulted and referenced in this report.

### 13.3. Stakeholder consultation

The stakeholder consultation took place between December 2024 and February 2025. Responses were received from the General Secretariat for Fisheries of MAPA. Questionnaires were also sent to relevant fishermen's organisations and environmental NGOs, but no responses were received from these stakeholders. This low response rate may be explained by stakeholder fatigue, as many of them are often asked to respond to questionnaires and interviews in national and EU contexts.

## 14. Results

### 14.1. Results of the stakeholder consultation

Stakeholders were consulted on the main reasons for the reported changes to the fleet's balance over the last five years. They concluded that the Spanish fleet is both large and diverse. As each fleet segment can be affected by different factors influencing equilibrium, there is no single explanation for the changes that have occurred in each segment. Some segments have fallen out of balance due to the state of the main target stock, while others have moved into balance due to cost reductions or good economic performance. It is important to note that external factors, such as the energy price crisis, have had a very negative impact on the economic performance of the different segments.

Stakeholders were also asked about the decisions adopted to maintain the balance of the fleet. They replied that these measures could include reducing effort, which could entail permanent cessation, temporary stops, or establishing maximum effort days, improving stocks and collecting data, surveillance measures, and permanent bans or reserve zones. Regarding permanent cessation, they concluded that it is an effective method of quickly reducing fishing capacity and can contribute to achieving equilibrium, provided that the affected segment is the only one operating on a stock in poor biological condition. This would not be the case for stocks targeted by fleet segments from other Member States. However, eliminating vessels is an irreversible measure with negative effects on coastal communities from economic and social perspectives. Therefore, definitive cessation measures must only be adopted after exhaustive analysis, and only when other management measures, such as closed seasons and temporary cessations, have not yielded the expected results. Definitive cessation measures shall always be limited in scope.

Respondents were also asked about the reasons for fleet inactivity and the measures taken to mitigate it. They considered that the majority of inactive vessels were below 12 metres in length, and that in these cases fishing was a complementary activity, so vessels could have periods of inactivity under certain circumstances. They considered that improving the status of fish stocks and thus ensuring the sustainability of fishing has been the adoption of the Total Allowable Catch (TAC) and quota system, which allows fishing within the margins of the maximum sustainable yield. Wider adoption of this system would overcome the limitations on fishing capacity that affect energy transition and generational change.

The respondents were asked about their use of capacity indicators for fleet management. They reported that the assessment of balance in each segment is carried out in accordance with EC guidelines. If the indicators reflect a clear imbalance, an action plan is established. This may include reducing effort, which could entail definitive cessation, temporary stops, bans, or the establishment of maximum effort days; improving stock, which could involve implementing surveillance measures, permanent bans, or reserve zones; and improving knowledge of the stock by collecting stock data. However, evaluating balance has important drawbacks. The segmentation system is rigid and does not adequately

characterize the Spanish fleet. The SHI biological indicator is difficult to obtain due to a lack of biological data, particularly in multi-species fleets. Therefore, it would be necessary to establish other, simpler indicators; the SAR indicator does not represent migratory species caught by fleets from third countries. It is also invalid where a segment catches a high percentage of a species' total catch, but this represents only a small percentage of the segment's total catch. Furthermore, stakeholders believe that the economic indicators are not representative of small-scale fleets, and technical indicators are not representative of non-homogeneous fleets.

The Global balance indicators (Table 2) show the evolution of the global balance indicator of the Spanish fishing fleet operating in the North Atlantic in the period 2018 – 2022, according to the National Fleet Reports published by the MAPA for these years <sup>(95)</sup>. The number of fleets in balance follows an increasing trend, from 16 (54%) in 2018 to 33 (94%) in 2022. The number of fleets globally out of balance is 2 in the study period. Currently, these are two segment of dredges (DRB) targeting Venus clam in the Gulf of Cadiz. The segment between 10 and 12 m length (DRB1012) and the segment between 12 and 18 m length (DRB1218). These fleet segments were considered to be globally out of balance in 2021 and in 2022 (Appendix 1) and therefore, subject to the most recent Action Plans i.e. MAPA (2023) and MAPA (2024).

**Table 39 – Evolution of the global indicators by fleet segment in the North Atlantic, according to the National Fleet Reports**

|                | 2018 | 2019 | 2020 | 2021 | 2022 |
|----------------|------|------|------|------|------|
| Out of balance | 2    | N.A  | 2    | 2    | 2    |
| In balance     | 16   | N.A  | 31   | 33   | 33   |
| “yellow”*      | 8    | N.A  | 0    | 0    | 0    |
| Total          | 26   | N.A  | 33   | 35   | 35   |

Source: National Fleet reports published between 2020 – 2024. Note: the global balance for 2019 is not published by MAPA.

\* Until 2009, the MAPA used the colour yellow to indicate neutral situations, where there was neither an imbalance nor a balanced situation.

## 14.2. Performance of relevant fleet segments

The following paragraph outlines the performance of fleet segments that have repeatedly shown either **in balance** or **out of balance results** in the balance assessments for the period 2018 – 2022. Appendices 2 and 3 illustrate the evolution of various indicators across all fleet segments, as outlined in the respective National Fleet Reports published by MAPA.

### 14.2.1. State of the art

<sup>(95)</sup> The National Fleet Report presents the evaluations made with data corresponding to two previous years, e.g. the report published in 2024 presents analysis for year 2022.



This section describes the evaluation of fleet balance in the current National Report (2024). Table 40 explains the meaning of the gear abbreviations used in this and the following subsections.

**Table 40 – Spanish fleet segments operating in the North Atlantic region referred in this report**

| Segment code                           | Description                                                                                                    | Main species targeted                                                                                                                               |
|----------------------------------------|----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| DRB0010; DRB1012, DRB128               | Dredges up to 10 m.; between 10 and 12 m, and 12 and 18 m in length targeting Venus clam and other bivalves    | Venus clam                                                                                                                                          |
| HOK0010; HOK1012; HOK1824; and HOK2440 | Vessels between 0 to 10 m; 10 and 12 m; 18 and 24 m; and 24 and 40 m in length respectively, using hook gears. | Vessels below 18 m target especially demersal species such as southern hake; small pelagics such as mackerel; vessels above 18 m also target tunas. |
| HOK2440-LLD                            | Vessels between 24 and 40 m using drifting long lines.                                                         | Albacore and bluefin tuna; swordfish                                                                                                                |
| PS0010; PS1012; PS1218, PS2440         | Purse seiners up to 10 m; and between 10 and 12 m; 12 and 18 m; and 24 and 40 m                                | Sardine, anchovy, horse mackerel                                                                                                                    |
| DFN1012; DFN1218; DFN1824              | Vessels using driftnets between 10 to 12 m; and 12 and 24 m in length                                          | Mostly southern hake and ling; larger boats northern hake, anglerfish, mackerel                                                                     |
| DTS2440                                | Demersal trawlers between 24 and 40 m in length.                                                               | Hake, ling, nephrops, sole, other demersal species; and mackerel                                                                                    |
| DTS40XX                                | Demersal trawlers above 40 m in length                                                                         | Cod, black halibut, redfish in NAFO area                                                                                                            |
| PGP2440                                | Vessels between 24 and 40 m using polyvalent passive gears                                                     | Northern hake, ling, albacore and bluefin tuna                                                                                                      |
| FPO1012                                | Vessels between 10 and 12 m in length that use pots and traps                                                  | Demersal species                                                                                                                                    |
| PMP0010                                | Vessels employing a variety of fixed and mobile fishing gear                                                   | Demersal and pelagic fish, molluscs and crustacea                                                                                                   |

According with the latest National Fleet Report (MAPA, 2024), five segments are in balance in 2022 for all indicators assessed: economic (CR/BER, ROFTA), technical (FecR), and biological (SHI and SAR) indicators. These are the segments using different modalities of hook gears i.e. HOK1824, HOK2440, HOK2440-LLD; and the purse seiners PS1012, PS2440. In turn, the driftnet segment DFN1824 have all the indicators in balance with the exception of CR/BER. The demersal trawlers DTS2440 show all positive results with the exception of the SAR indicator. PS1218 and PS1824 have all indicators in balance this year except the technical indicator.

Although in 2022 none of the segments have all the indicators out of balance there are some segments with most indicators in the situation. The most notable is the segment of dredges DRB1218, where the economic and technical indicators are out of balance. The biological indicator SAR, however, is considered to be in balance. The MAPA (2024) considers that the global indicator for this segment is out of balance. DFN1218 in turn has the CR/BER indicator in

balance, but the ROFTA indicator, the technical indicator, and the biological indicator SAR are out of balance. PMP0010 has the ROFTA indicator in balance, but the CR/BER indicator, the technical indicator, and the biological indicator SAR are out of balance.

#### 14.2.2. Segments with recurrent positive evolution in the period

Looking at the period 2018 – 2022, it is observed how the fleet segments using hooks (HOK) and purse seiners (PS) have the best performance of all fleets, with all/most indicators in balance in all/most years. Indeed, HOK2440 was in equilibrium for all indicators throughout the period. HOK1824 has been in balance since 2019 considering the economic, technical and SAR indicators. HOK 2440-LLD was in balance for the technical and biological indicators but had negative results for the economic indicators in two consecutive years, 2020 and 2021. Regarding purse seiners, segment PS1824 was always in balance for all indicators from 2018 to 2022. Similarly, PS1012 showed a positive evolution in all indicators throughout the period. The SAR indicator was only out of balance in 2020. PS1824 was in balance in the economic and biological indicators over the study period. PS1218 was in equilibrium in all years considering the economic and SHI indicators. Its SAR indicator was only in equilibrium between 2020 and 2022. However, both PS1218 and PS1824 were out of balance in the technical indicator throughout the period studied.

#### 14.2.3. Segments with recurrent negative evolution

Looking at the period 2018 – 2022, dredgers DRB0010 show a recurring negative evolution of the technical and economic indicators. While the technical indicator is out of balance from 2018 onwards, its economic indicators are all negative from 2020 onwards. However, its overall indicator is in balance. The DRB1012 segment also shows a negative evolution over the period. In particular, the economic indicators are out of balance in 2021. In contrast, the technical indicators are positive. Nonetheless, in 2021 and 2022 MAPA considered this segment to be globally out of balance (MAPA 2023, 2024). In the DRB1218 segment, all economic indicators are out of balance from 2021 onwards. The technical indicator is also out of balance in 2021 and 2022. The global indicator for this segment is out of balance between 2021 and 2022. As mentioned before, both dredging segments are included in the Action plans for 2023 and 2024. The SHI indicator has not been assessed for any of the dredging segments. The SAR indicator is considered to be in balance for the three dredging segments from 2020 (MAPA, 2024).

The segment using driftnets DFN1218 also shows a negative evolution throughout the period 2018 – 2022. Its economic indicators are out of equilibrium in 2021. Its technical indicators are out of balance from 2020. The SAR indicator is out of equilibrium from 2020 onwards, having not been evaluated before. The pot segment FPO1012 also shows irregular results over the period, alternating many negative results with some positive evaluations, and in some concrete years it shows almost all indicators out of balance. In 2021, for example, the

economic indicators and the SAR indicators were out of balance. From 2020, the passive polyvalent gear PGP2440\* gives negative results for the two economic indicators and the SAR indicator. In 2020, the SHI indicator was out of balance. The HOK1012\* also shows irregular economic results between 2018 and 2022, although they are mostly positive. However, the technical and SAR indicators are out of balance from 2020.

### 14.3. Evolution of the biological indicators

Table 41 and Table 42 provide an overview of the evolution of the biological indicators over the period 2018 – 2022, as reported in the national fleet reports published by MAPA. In 2022, the SHI indicator is out of balance for 3 fleet segments: DTS40XX, HOK0010 and PS0010. In turn, the SAR indicator is out of balance for 11 fleet segments, i.e. 2 driftnet segments, 4 trawler segments, 3 hook-and-line segments, and 2 segments of polyvalent passive and active gear (see Appendix 3).

Overall, it can be stated that the number of segments with an out of balance SHI indicator has decreased in the period 2018 – 2022. In 2018, there were six segments out of balance (55% of the evaluated segments) and currently there are three (16%). In the period 2018 - 2020, the segments of driftnets DFN1218, DFN1824, DTS 2440 were in an out of balance situation with regard to the SHI indicator.

DFN1218 and DFN1824 were part of the Action Plan 2020 since the SHI indicator indicated their dependency on overexploited resources, mainly southern hake and mackerel (Table 46). According to MAPA (2020), driftnets, particularly DFN1218, showed a clear dependence on stocks that were overexploited until 2020 (analysis based on 2018 data), i.e. southern hake and mackerel. DFN1824 and DFN 2440 segments were also included in the Action Plan published in 2021 and 2022 (Table 46). Similarly, the segments of trawlers DTS1218 and DTS2440 were also included in the Action Plan 2020 due to the imbalance of the SHI indicator due to their dependency on whitening and southern hake. The hook segments HOK1012, HOK1218, and HOK1824 were also part of the Action Plan 2020 due to the imbalance of their SHI indicators. These segments were dependent on mackerel and southern hake. The Management Measures included in the Action Plan 2020 encompassed the distribution of individual quotas per vessel of the Spanish quotas of hake, whitening, megrim, Nephrops and anglerfish for trawlers, and individual distribution of hake for driftnets and hook gear. Common measures for all concerned segments included the registration of all catches, the verification of weighting at landing, and the calibration of mesh sizes. In addition, the Action Plans for 2021 and 2022 included measures to address the issue of driftnets, such as diversifying fishing activities to allow boats to target bonito; reducing fishing effort by restricting the time that gears are left in the water and implementing permanent and temporary area closures; and strengthening the system for collecting stock data.

With regard to the SAR indicator, the number of fleets that are out of balance in the period 2020 – 2022 has decreased from 15 (45% of all segments assessed) to 11 (33%). There are seven fleet segments that are consistently out of balance in all years, i.e. DFN1012 and DFN1218, DTS1218, DTS1824, DTS40XX, HOK1012, PGP2440. There are a few others that seem to be starting a negative trend, being out of balance in this indicator in the last two years of the series, i.e. DTS2440, DTS40XX, HOK1218 and PMP0010.

**Table 41 – Number of segments with an estimation of the SHI indicator**

|                | 2018 | 2019 | 2020 | 2021 | 2022 |
|----------------|------|------|------|------|------|
| Out of balance | 6    | 4    | 5    | 2    | 3    |
| In balance     | 5    | 8    | 7    | 9    | 16   |
| Total          | 11   | 12   | 10   | 6    | 19   |

*Data source:* National Fleet Reports

**Table 42 – Number of segments with an estimation of the SAR indicator**

|                | 2020 | 2021 | 2022 |
|----------------|------|------|------|
| Out of balance | 15   | 13   | 11   |
| In balance     | 18   | 20   | 22   |
| Total          | 33   | 33   | 33   |

*Data source:* National Fleet Reports

#### 14.4. Evolution of the economic indicators

According to the latest National Fleet Report (MAPA, 2024), the CR/BER indicator is out of balance in three fleet segments. The ROFTA indicator is currently out of balance in five fleet segments. Tables 5 and 6 provide an overview of the economic indicators for the period 2018 – 2022. The number of fleet segments with each indicator out of balance increases slightly, peaking in 2023 with nine segments out of balance for each indicator (see Table 43 and Table 44). As mentioned by the MAPA in the survey, the increase in energy prices in recent years has had a significant negative impact on the economic results of the different segments of the fleet. In addition, the COVID-19 pandemic and its lockdown are also among the factors determining negative economic results, particularly for operators dealing with fresh fish (MAPA, 2022). Nevertheless, the MAPA respondents to the survey considered that the economic indicators may not be representative for small fleets.

**Table 43 – Number of segments with an estimation of the CR/BER indicator**

|                | 2018 | 2019 | 2020 | 2021 | 2022 |
|----------------|------|------|------|------|------|
| Out of balance | 2    | 2    | 5    | 9    | 3    |
| In balance     | 23   | 22   | 19   | 14   | 22   |
| “yellow”       |      | 1    | 1    | 2    |      |
| Total          | 26   | 25   | 25   | 25   | 25   |

*Data source:* Spanish national fleet reports (MAPA 2020 to 2024)

**Table 44 – Number of segments with an estimation of the ROFTA indicator**

|                | 2018 | 2019 | 2020 | 2021 | 2022 |
|----------------|------|------|------|------|------|
| Out of balance | 2    | 3    | 5    | 9    | 5    |
| In balance     | 23   | 21   | 20   | 14   | 20   |
| “yellow”       | 1    | 1    |      | 2    |      |
| Total          | 26   | 25   | 25   | 25   | 25   |

*Data source:* Spanish national fleet reports (MAPA 2020 to 2024)

Appendix 2 shows a detailed evolution of the economic indicators for the different Atlantic fleet segments over the period 2018 – 2022. Eight fleet segments have one or both economic indicators out of balance, in most cases for two or even three consecutive years. These are DRB1012 and DRB1218, PGP2440, FPO1218 and HOK2440 LLD. The DRB1012 segment is out of balance between 2020 and 2022. PGP2440 is also out of balance in these last three years. Looking at the evolution of PGP2440, it appears that this fleet segment is losing profitability. In 2018 and 2019, the fleet segment was in balance for both economic indicators. MAPA (2024) mentions that the reasons for the recent results are not biological, as northern hake, the main stock caught by this segment, has improved its status.

#### 14.5. Evolution of technical indicators

The National Fleet Reports indicate that a given fleet segment may be in balance in global terms despite the technical indicator being out of balance, provided that the biological and economic indicators are in balance. Between 30 and 34 fleet segments in the North Atlantic were assessed in terms of the technical indicator in the period 2018 – 2022. In 2020 and 2022, 12 segments in this sea area were classified as out of balance for this indicator, compared with 10 segments in the previous two years. The technical indicator FecR reflects the degree of utilisation of vessels in terms of the fishing effort that could be deployed versus the fishing effort actually deployed. Most of the inactive vessels belong to the fleet of less than 12 m length, where fishing is not the main economic activity for the boat owners, thus vessels may have periods of inactivity. This may be reflected in the number of fleets under 12 m that are out of balance in the technical and economic indicators. As mentioned by MAPA in the survey, the technical indicator may not be representative in non-homogeneous fleets. This is particularly relevant for small fleets. In addition, as MAPA (2022) suggests small-scale segments and even larger scales segment were affected by the lockdown and thus their technical indicator was affected.

Table 7 shows the evolution of the FecR indicator over the study period 2018 – 2022. The number of fleets out of balance increases in 2020 and then remains relatively stable until the end of the series. The segments considered to be in balance also follow an increasing trend. Since 2021, the national fleet reports do not use the neutral category (in yellow), which seems to be merged with the in-balance situation. Seven fleet segments show continuously negative results over

the whole study period: DFN1012, DRB1012, HOK1218, PMP1012, PMP1012, PS1218 and PS1824.

**Table 45 – Number of segments with an estimation of the FecR indicator**

|                | 2018 | 2019 | 2020 | 2021 | 2022 |
|----------------|------|------|------|------|------|
| Out of balance | 10   | 8    | 12   | 11   | 11   |
| In balance     | 11   | 8    | 18   | 18   | 22   |
| “yellow”       | 12   | 14   | 3    | 4    | --   |
| Total          | 34   | 30   | 33   | 33   | 33   |

Data source: Spanish national fleet reports (MAPA 2020 to 2024)

#### 14.6. Action Plan for the fishery of Venus clam in the Gulf of Cadiz

This subsection focuses on the fleet segments included in the current Action Plan in the region and identifies the measures proposed to address the imbalance for the fleets subject to these plans. MAPA highlighted through the stakeholder survey, that the Action Plans cover effort reduction, including permanent or temporary cessation, prohibition or setting of maximum effort days; stock status improvement, including the implementation of monitoring measures, permanent prohibition or reserve zones; and improved knowledge of the stock, including the development of surveys to collect data. Action plans run for two or three years, from June of the first year to June of the last year. There are currently two dredge segments in the North Atlantic subject to an Action Plan (Table 46).

There are 11 fleet segments subject to Action Plans in other fishing grounds where the Spanish fleet operate. These are not dealt with in the current case study. Table 46 provides an overview of the fleet segments that are currently subject to current Action Plan, as well as of other segments that were subject to Action Plans in the past. A brief description of the reasons for the inclusions of those segments in past Action Plans and of the measures conducted by MAPA is included in Section 3.4 on evolution of biological indicators in this report.

**Table 46 – Fleet segments in the Action Plans 2020 – 2024**

|                                        | ACTION PLAN 202                                                               | ACTION PLAN 2021                      | ACTION PLAN 2022              | ACTION PLAN 2023           | ACTION PLAN 2024   |
|----------------------------------------|-------------------------------------------------------------------------------|---------------------------------------|-------------------------------|----------------------------|--------------------|
| North Atlantic segments in ACTION PLAN | DTS1018<br>DTS2440<br>DFN1218 (*)<br>DFN1840<br>HOK1012<br>HOK1218<br>HOK1824 | DFN1824 (*)<br>DFN2440 (*)<br>DFN1218 | DFN1824<br>DFN1218<br>DFN2440 | DRB1012 (*)<br>DRB1218 (*) | DRB1012<br>DRB1218 |

Note: (\*) Considered in the Action Plan for the first time

##### 14.6.1. Description of the fishery

The Venus clam (*Chamelea gallina*) in the Gulf of Cadiz (ICES Sub-area 9) is a resource targeted by both hydraulic and towed dredges. It is a short-lived species

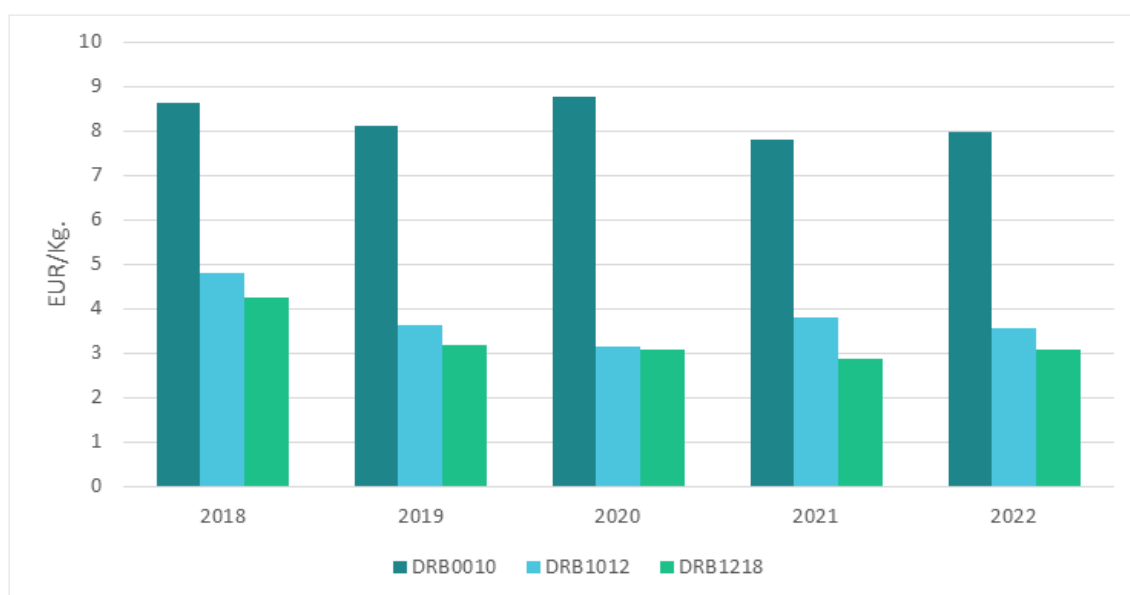


that is highly dependent on recruitment and environmental factors such as currents, adverse meteorological events and river discharge (Caparro, 2019). The Venus clam fishery in this area is managed by the Government of the Autonomous Community of Andalusia, which has competence in the management of shellfish resources and fishing in inland waters. The resource has been subject to intensive exploitation in recent decades. Delgado et al. (2023) indicates that in the 1970s and 1980s the fleet consisted mainly of towed dredges, with landings of around 500 tonnes at the end of the 1980s. In the 1990s, the introduction of hydraulic dredges increased catches, which exceeded 4,000 tonnes at the beginning of the new century. According to Caparro (2019), the number of hydraulic dredges tripled in ten years, from 28 in 1997 to 98 in 2007.

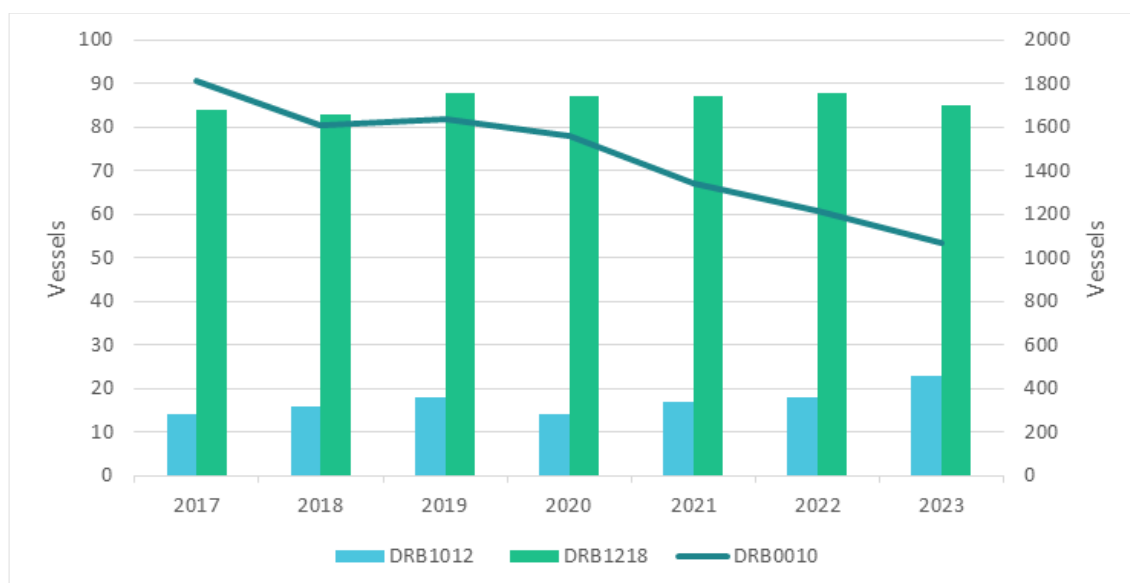
According to STECF data (STECF, 2023b), the total landings of this dredge fishery reached 4 617 tonnes in 2022, while the revenue reached a value of around EUR 31.6 million. The revenue of the fishery follows a decreasing trend since 2017, when the estimated revenue was EUR 46.05 million (-31%). The value of landings, in turn, reached EUR 27.3 million. Compared to the value reached in 2017 (EUR 36.8 million), this represents a decrease of -25.8%. The fall in revenue could be explained by the closures imposed by the regional government in recent years due to signals of overfishing. The fall in the value of landings may reflect changes in prices. Figure 31 shows the decline in prices for the different fleet segments. The reasons for the changes in market conditions for Venus clams are not reported in the literature.

In 2023, the fleet consisted of 1 179 vessels, of which 91% were in the DRB0010 fleet segment, 2% in the DRB1012 and 7% in the DRB1218. Figure 32 shows the evolution of the fleet size in terms of vessels. In 2022, the fishery employed 2 524 fishers, while in 2017 the number of fishers was 3 805. This represents a reduction of about 33.6% in direct employment. It appears that the main reason for the reduction in employment is linked to the reduction in the size of the fleet in segment DRB0010. The fishery has been affected by the impact on operating costs, mainly due to the increase in fuel prices. This has particularly affected the segment of the fleet in which the largest vessels participate, i.e. DRB1218, while in the DRB1012 segment energy costs have remained fairly constant and in the DRB0010 segment costs have decreased, probably due to the reduction in the number of vessels in the segment (Figure 33).

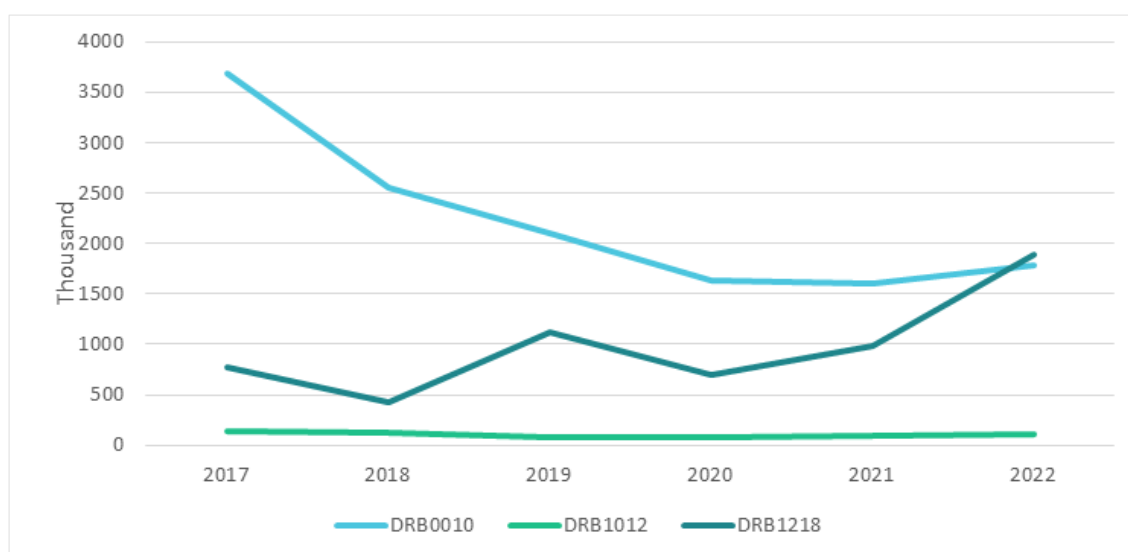


**Figure 31 - Evolution of prices of Venus clam in Gulf of Cadiz**

Source: STECF data (STECF, 2023b).

**Figure 32 - Evolution of the fishery in number of vessels**

Source: STECF data (STECF, 2023b).

**Figure 33 - Evolution of energy cost in the fishery**

Source: STECF data (STECF, 2023b).

#### 14.6.2. State of the resource and management measures

By mid-2016, the Venus clam stock was showing strong signs of reduced abundance and consequently reduced commercial catches. The Government of the Autonomous Community of Andalusia responded by stating that this situation could lead to the collapse of the fishery and asked the IEO to carry out an assessment. The Institute recommended that the fishery be closed from October 2016 to July 2017. In June 2017, the regional government issued a decree <sup>(96)</sup> technical measures such as gear restrictions and a catch limit of 2 500 tonnes per year, CPUE below 0.8 kg per minute and area restrictions, minimum landing sizes and access conditions for hydraulic dredges, while introducing the objective of achieving maximum sustainable yield in accordance with EU Regulation 1380/1213. The fishery was reopened in July 2017 with the aim of implementing and monitoring the measures contained in the Regulation, but the stock did not recover, and the fishery was closed again between January 2018 and October 2018. New management measures were developed, and a TAC of 1 300 tonnes was set. A management plan for this fishery was implemented in April 2020, establishing the principle that catches should not exceed MSY levels. The management plan maintained the CPUE limit of 0.8 kilograms per minute. The Resolution of 21 June 2024 reports that the last assessment carried out by the IEO estimated a biomass of around 19,095 tonnes, of which around 1 664 tonnes

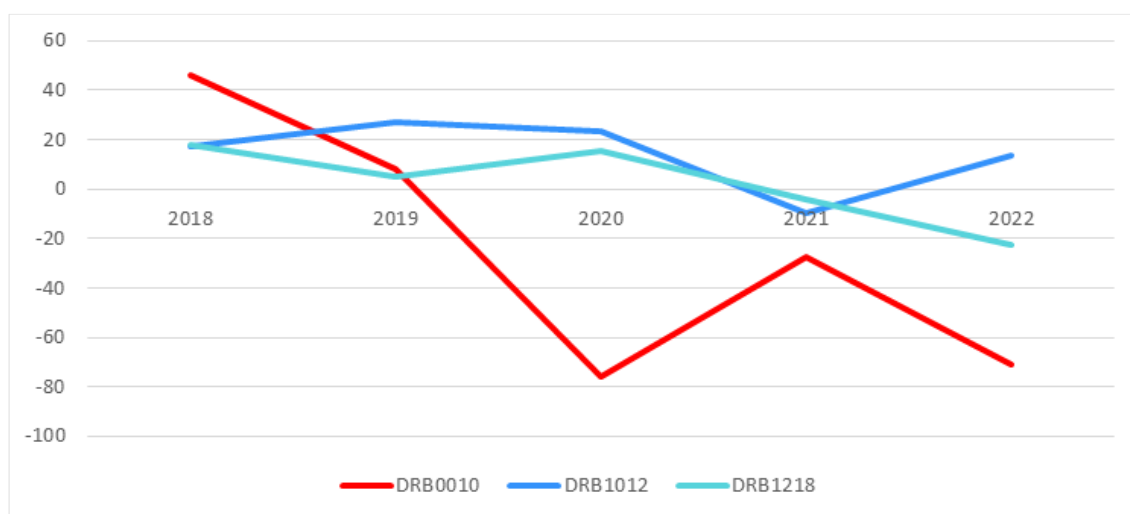
<sup>(96)</sup> Orden de 29 de junio de 2017, por la que se regula el marisqueo desde embarcación con draga hidráulica en el Golfo de Cádiz estableciendo medidas técnicas a fin de alcanzar niveles de rendimiento máximo sostenible.

correspond to individuals above the commercial size ( $> 2.5$  mm) <sup>(97)</sup>. The fishing plan published in the above-mentioned resolution sets a TAC of 1 700 tonnes and a limit of 750 tonnes/week of mussels for hydraulic and towed dredges.

#### 14.6.3. Economic situation

These fleet segments also showed a negative evolution in the economic indicator over the period. In fact, the dredging fleets show a worsened economic performance over the period (Appendix 2). DRB0010 shows a decrease in the CR/BER indicator of -1.551%, with an absolute value of -1.5 in 2022; and also, a decrease in the ROFTA indicator of -27%, with an absolute value of -71 in the last year of the series. Figure 34 shows the evolution of the ROFTA indicator in the three dredging segments DRB0010, DRB1012 and DRB1218. Note that all segments present negative trends. The first segment was in an out of balance situation for three consecutive years (2020 - 2022). In the second case, the segment was only out of balance in 2001. The third segment was unbalanced for two consecutive years, 2021 and 2022. According to MAPA (2023), the poor economic performance is due to the closures of the clam fishery in recent years. It is also likely that the increase in energy costs has also had a negative impact on the economic performance of these segments, as mentioned above.

**Figure 34 - Evolution of the ROFTA indicator in the dredge segments (2018 – 2022)**



*Data source:* National Plans published by MAPA in the period 2020 – 2024

#### 14.6.4. Features of the Action Plan

The situation of dredge segments DRB1012 and DRB1218 targeting Venus clams was addressed for the first time in the 2023 Action Plan and is in force for two consecutive years. The results of the proposed management measures will

<sup>(97)</sup> Resolución de 21 de junio de 2024, de la Dirección General de Pesca y Acuicultura, por la que se aprueba el plan de pesca de la pesquería de chirla (*Chamelea gallina*) en el Golfo de Cádiz para la campaña 2024-2025.

be evaluated in 2025. The decision to include these fleet segments is based on the dependence of the overfished Venus clam stock (MAPA, 2023) and the economic out of balance (Fernandez, 2023). The IEO (2019) reported that the management measures implemented for the sustainable exploitation of the Venus clam have not prevented a decline in the abundance of the species, which reached values close to the limit biomass. The main objective of the Action Plan is to fish at the level of maximum sustainable yield (MSY), with a ceiling on CPUEs that should be below 0.8 kg per minute, which is the precautionary reference point. In turn, the economic objective is a CR/BER indicator greater than 1. For achieving these two objectives, the ministry plans an important reduction in fleet capacity in the segments covered by this Action Plan to be conducted in the following way: decommissioning of seven vessels by 2024 and eight by 2025. This reduction can contribute to achieving a target profitability of 15%, which is the average profitability of the DRB 1012 segment over the period 2016 – 2021. These figures are based on studies carried out by MAPA analysing catches, costs and the number of vessels.

## 15. Discussion

According to the assessments made by MAPA, the fleet operating in the North Atlantic is deemed largely in balance, with only two segments currently in a global out of balance situation, i.e. DRB1218 and DRB1824 targeting Venus clam in the Gulf of Cadiz. However, the review of the National Plans and their economic, biological and technical indicators shows that many fleets are repeatedly out of balance for some or even most of the indicators in the period 2018-2022. There are different criteria used by MAPA to consider a fleet to be globally out of balance and this can vary from segment to segment. In general, the biological and economic criteria seem more relevant for the administration than the technical indicator and may determine that a segment is considered to be in balance despite the technical indicator is out of balance. There are even some cases where a given fleet segment may have one or two of these indicators out of balance and still be considered to be in overall balance. In general, the national reports use the EC's Guidelines for the evaluation of the balance of fleet capacity and explain the different criteria used for these decisions. National fleet reports indicate that a given fleet segment may be balanced globally, despite the technical indicator being unbalanced, provided the biological and economic indicators are balanced. While the technical indicator is included for reference, it is not essential for evaluating the global balance situation, as it does not consider the specific characteristics of small-scale fleets.

The fleets deemed as globally out of balance throughout the period 2018 – 2022 (Action Plans 2020 – 2024), such as some segments of demersal trawlers (DTS), vessels operating hook gears (HOK), driftnets (DFN), and currently dredges (DRB), were included in Action Plans at some point (see Section 3.6). It is notable that some of these fleets are currently being considered in balance in most or all indicators such as the HOK1824 segment that was subject to an Action Plan in 2020 and since 2021 have been in balance in all indicators. These fleets were

included in the Action Plans due to their dependence on overexploited fish stocks. In particular, imbalances in the biological indicator SHI due to dependency on hake and mackerel stocks that were overexploited at that time were key factors in their inclusion in those Action Plan.

A particularly relevant issue is that of fleet segmentation, which, according to the National Plan 2021 (MAPA, 2021), is rather rigid and hinders an accurate characterization of the Spanish fleet. This can make it difficult to carry out assessments and propose management measures that are more suited to the characteristics of the Spanish fleets, where the majority of vessels are of small-scale nature. According to National Reports, the economic and technical indicators may not be appropriate for small-scale fisheries. In the first case, because of the amount and detail of data to be collected in such a heterogeneous fishery. In the second case, the heterogeneity of target species and the variety of gear used make it difficult to estimate vessel utilisation. In fact, it is estimated that 33% of the fishing fleet operates less than 90 days a year (MAPA, 2021). In addition, the small-scale nature of the activity in terms of seasonality and the fact that that activity is often only an economic activity which is complementary to the main economic activity for many fishers may also hamper the accurate use of technical indicators such as the technical indicator (VUR, max = 220 days) not suitable for the characteristics of small-scale fleets segments. This indicator is included in the national reports only as a reference.

The current Action Plan (MAPA, 2024) applies to two segments of dredges, DRB1218 and DRB1824. These segments have shown recurrent imbalance situations for most of the indicators during the study period. The MAPA considers that the economic deterioration of the activity requires to reduce redundant fishing capacity. With this aim a decommissioning programme has been put in place to scrap 15 vessels with public funding. It is notable that the balance evaluation considers that the biological SAR indicators are currently balanced in the three segments. The IEO assessments in turn points at fluctuating stock abundance and vulnerability of the resource to environmental factors. This has led to a number of temporary closures during the last years. The fishery shows signs of economic deterioration, particularly in DRB0010 and DRB1218. Nevertheless, only segments DRB1012 and DRB1218 are included in the Action Plan. The segment DRB0010 is not included in the Action Plan, despite its economic deterioration and negative technical indicators. This segment has experienced a steady reduction in the number of vessels, which could be caused by the closure of fishing grounds and by problems related to the increase in fuel prices and the pandemic lockdown.

## 16. Conclusions and recommendations

Overall, the analysis of fleet balance conducted by the MAPA indicates that only two segments of the North Atlantic Spanish fleet are currently in a global imbalance situation i.e. dredges. However, a closer look at the different indicators shows that many segments are in an out of balance situation on most indicators. The criteria for considering a segment to be in balance or out of balance vary according to the indicator and the segment itself. In general, biological and economic indicators determine the global balance situation. Action Plans are an important tool to address recurrent imbalances and fleet segments that have shown recurrent imbalances for most biological and economic indicators have been included in these plans in recent years. In particular fleets dependent on demersal stocks such as trawlers (DTS), hooks gear (HOK), driftnets (DFN), and currently dredges (DRB) targeting Venus clams. DTS and HOK segments were included in Action Plans due to the biological imbalance concerning southern hake, and mackerel. These fleets are currently being considered in global balance situation.

Venus clams appear to be particularly vulnerable to intensive exploitation, which has led to two closures in the last five years. The resource is subject to management plans by the regional government of Andalusia, with output measures such as TACs and input measures in place, and active scientific monitoring. The fishery has been closed twice in the last five years due to declining catches. Fleet reduction appears to be the main objective of the action plan to prevent further overfishing. In economic terms, the fleets show signs of deterioration and appear to be vulnerable to cyclical factors such as fuel costs, fluctuating resource abundance, rivers' runoff, and market prices. This may have led to a reduction in the size of the fleet in DRB0010. Further reductions will take place in DRB1012 and especially in DRB1218 under the current action plan. DRB0010 is excluded from the plan, even though it showed more economic and technical out of balance than the other dredging segments during the study period. In any case, the number of vessels in this segment shows a decreasing trend over the period. Social considerations may be a factor to be considered if further measures are introduced by the authorities. The dredging fleet in general, and this segment in particular, has experienced a significant loss of direct employment (33%) over the last six years.

### Recommendations:

- The fleet segmentation system appears to be rather rigid and hinders an adequate characterization of the Spanish fleet. A review of fleet segmentation could therefore be carried out, paying particular attention to small-scale fisheries.
- It is necessary to establish clear criteria for considering a given fleet segment to be in overall equilibrium between fishing possibilities and capacity when not all indicators are in equilibrium. Considering that a

single official criterion may not fit all fleet segments in the EU, a regional approach may be proposed to better reflect the specificities of the different national fleets.

- Some of the indicators may not be suited to the complexity of small-scale fisheries. It seems necessary to analyse the gaps in data and fleet characterization of small-scale sectors in order to propose more realistic indicators.
- There is a lack of socio-economic studies on the market conditions of the Venus clam in Andalusia. Studies should be carried out to understand the social impact of market conditions on economic performance.
- Social considerations need to be considered if further measures are introduced by the authorities in the dredging segment DRB0010, due to the potential loss of direct employment in this largest segment of the dredging fleet.

## 17. References

- Delgado, M., Silva, L., Román, S., Llorens, S., Rodríguez-Rúa, A., Cojan, M., & Hidalgo, M. (2023). Spatial distribution patterns of striped venus clam (*Chamelea gallina*, L. 1758) natural beds in the Gulf of Cádiz (SW Spain): Influence of environmental variables and management considerations. *Regional Studies in Marine Science*, 63.
- IEO (2019). Informe de seguimiento y evaluación de la pesquería de la chirla del Golfo de Cádiz. Junio 2019. Available at: [https://www.juntadeandalucia.es/export/drupaljda/20190615\\_Informe%20SEGUIX%20Y%20EVALUAX\\_junio\\_2019\\_IEO.pdf](https://www.juntadeandalucia.es/export/drupaljda/20190615_Informe%20SEGUIX%20Y%20EVALUAX_junio_2019_IEO.pdf)
- Fernandez-Martinez, F.J. (2023). Plan de acción e Informe de Flota. Presentation in Jornada OPPAO. Ondarroa. Spain. Available at: <https://oppao.es/wp-content/uploads/2023/06/Informe-de-flota-y-plan-de-acci%C3%B3n-jornada-OPPAO.pdf>
- MAPA (2020 - 2024). National Fleet Plans and Action Plans. Available at: <https://www.mapa.gob.es/es/pesca/temas/registro-flota/informes-flota-pesquera-plan-accion/>
- Silva-Caparro, L. (2019). Evolución y situación actual de la pesquería de chirla *Chamelea gallina* en el Golfo de Cádiz. Available at: <https://www.galpcnocadiz.com/wp-content/uploads/2019/06/06-Situacion-Pesquerias-chirla-1.pdf>
- STECF (2023a). Assessment of balance indicators for key fleet segments and review of national reports on Member States efforts to achieve balance between fleet capacity and fishing opportunities (STECF-23-13), Casey, J. and Virtanen, J. editor(s), Publications Office of the European Union, Luxembourg, 2024, doi:10.2760/958072, JRC136331.
- STECF (2023b). Annual Economic Report on the EU Fishing Fleet (STECF 23-07), Prelezo, R., Sabatella, E., Virtanen, J., Tardy Martorell, M. and Guillen, J. editor(s), Publications Office of the European Union, Luxembourg, 2023, doi:10.2760/423534, JRC135182.



## Appendix 1: Indicators of the Spanish fleet segments operating in the North Atlantic Ocean (2024)

| Segment           | CR/VER | ROFTA  | FecR | SHI  | SAR | Overall indicator |
|-------------------|--------|--------|------|------|-----|-------------------|
| NAO DFN0010       |        |        | 1    |      |     |                   |
| NAO DFN1012*      | 3,3    | 81,25  | 0,64 |      | 1   |                   |
| NAO DFN1218       | 2,62   | 60,37  | 0,66 |      | 1   |                   |
| NAO DFN1824*      | 2,12   | 31,66  | 0,93 | 0,72 |     |                   |
| NAO DFN2440       |        |        | 1    | 0,69 |     |                   |
| NAO DRB0010       | -1,5   | -71,18 | 0,4  |      |     |                   |
| NAO DRB1012       | 1,55   | 13,84  | 0,72 |      |     |                   |
| NAO DRB1218       | 0,1    | -22,53 | 0,74 |      |     |                   |
| NAO DTS1012       |        |        | 0,87 |      |     |                   |
| NAO DTS1218*      | 2,94   | 65,49  | 0,86 |      | 1   |                   |
| NAO DTS1824       | 2,86   | 45,14  | 0,74 |      | 1   |                   |
| NAO DTS2440       | 1,36   | 11,95  | 0,74 | 0,85 | 2   |                   |
| NAO DTS40XX       | 3,25   | 90,47  | 0,92 | 1,04 | 5   |                   |
| NAO FPO1012       | 2,53   | 38,5   | 0,66 |      |     |                   |
| NAO FPO1218       | 4,56   | 92,35  | 0,7  |      |     |                   |
| NAO HOK0010       |        |        | 1,12 | 1,03 |     |                   |
| NAO HOK1012*      | 1,28   | 10,41  | 0,55 | 0,91 | 1   |                   |
| NAO HOK1218       | 2,09   | 35,07  | 0,62 | 0,81 | 1   |                   |
| NAO HOK1824       | 2,78   | 52,57  | 0,76 | 0,77 |     |                   |
| NAO HOK2440       | 3,21   | 135,39 | 0,82 | 0,72 |     |                   |
| NAO HOK1218 LLD   |        |        | 1,23 | 0,71 |     |                   |
| NAO HOK1824 LLD   |        |        | 1,01 | 0,81 | 1   |                   |
| NAO HOK 2440 LLD* | 1,95   | 44,33  | 0,85 | 0,79 |     |                   |
| NAO PGP1824       |        |        | 1,01 | 0,8  |     |                   |
| NAO PGP2440*      | 0,95   | -1,9   | 0,91 | 0,79 | 3   |                   |
| NAO PMP0010       | 1      | 0,04   | 0,41 |      | 2   |                   |
| NAO PMP1012       | -1,46  | -67,6  | 0,58 |      |     |                   |
| NAO PMP1218       | 1,6    | 15     | 0,92 |      |     |                   |
| NAO PS0010        |        |        | 1    | 1,14 |     |                   |
| NAO PS1012*       | 3,36   | 52,87  | 0,83 | 0,82 |     |                   |
| NAO PS1218        | 4,63   | 94,81  | 0,53 | 0,83 |     |                   |
| NAO PS1824*       | 2,42   | 50,34  | 0,63 | 0,99 |     |                   |
| NAO PS2440*       | 2,14   | 47     | 0,82 | 0,92 |     |                   |

## Appendix 2: Evolution of the economic and technical indicators of the Spanish fleet segments operating in the North Atlantic Ocean (2018 – 2024)

# European Union's fishing fleet: evolution, challenges and future – Final Report

| Segment       | CER/VER |       |       |       |       |        | ROFTA  |        |        |        |        | Trend   | FecR |      |      |      |      | Trend  |
|---------------|---------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|---------|------|------|------|------|------|--------|
|               | 2018    | 2019  | 2020  | 2021  | 2022  | Trend  | 2018   | 2019   | 2020   | 2021   | 2022   |         | 2018 | 2019 | 2020 | 2021 | 2022 |        |
| DFN0010       |         |       |       |       |       |        |        |        |        |        |        |         | 1    | 1    | 1    | 1    | 1    |        |
| DFN1012*      | 3,23    | 6,98  | 1,33  | 2,11  | 3,3   | -1,026 | 78,90  | 163,5  | 20,72  | 39,94  | 81,25  | -22,753 | 0,65 | 0,65 | 0,57 | 0,58 | 0,64 | -0,009 |
| DFN1218       | 1,1     | 1,19  | 1,45  | -0,14 | 2,62  | 0,171  | 2,74   | 11     | 21,61  | -36,62 | 60,37  | 6,764   | 0,74 | 0,7  | 0,66 | 0,69 | 0,66 | -0,017 |
| DFN1824*      | 1,26    | 1,67  | 1,33  | 0,8   | 2,12  | 0,085  | 9,86   | 28,75  | 16,07  | -8,34  | 31,66  | 0,651   | 0,84 | 0,89 | 0,86 | 0,90 | 0,93 | 0,019  |
| DFN2440       |         |       |       |       |       |        |        |        |        |        |        |         | 1,03 | 1,01 | 1,02 | 0,99 | 1    | -0,006 |
| DRB0010       | 5,41    | 1,65  | -1,6  | -0,04 | -1,5  | -1,551 | 46,35  | 8,07   | -75,6  | -27,36 | -71,18 | -27,049 | 0,49 | 0,49 | 0,45 | 0,38 | 0,4  | -0,029 |
| DRB1012       | 4,52    | 3,83  | 1,84  | 0,77  | 1,55  | -0,900 | 17,5   | 27,01  | 23,5   | -9,49  | 13,84  | -4,382  | 0,65 | 0,69 | 0,92 | 0,67 | 0,72 | 0,012  |
| DRB1218       | 2,69    | 1,49  | 1,7   | 0,84  | 0,1   | -0,583 | 18,05  | 5      | 15,68  | -4,23  | -22,53 | -9,039  | 0,79 | 0,87 | 0,42 | 0,48 | 0,74 | -0,049 |
| DTS1012       |         |       |       |       |       |        |        |        |        |        |        |         | 1,06 |      | 0,93 | 0,79 | 0,87 | -0,057 |
| DTS1218*      | 2,61    | 6,13  | 4,19  | 2,64  | 2,94  | -0,283 | 53,74  | 67,31  | 86,94  | 60,58  | 65,49  | 1,677   | 0,85 | 0,86 | 0,83 | 0,87 | 0,86 | 0,003  |
| DTS1824       | 4,49    | 4,6   | 3,12  | 1,45  | 2,86  | -0,641 | 92,36  | 85,86  | 56,44  | 11,1   | 45,14  | -16,920 | 0,84 | 0,84 | 0,8  | 0,8  | 0,74 | -0,024 |
| DTS2440       | 1,14    | 0,98  | 1,25  | 1,11  | 1,36  | 0,057  | 6,95   | -1,1   | 12,5   | 6,67   | 11,95  | 2,134   | 0,79 | 0,78 | 0,79 | 0,79 | 0,74 | -0,012 |
| DTS40XX       | 1,53    | 1,05  | 1,22  | 1,41  | 3,25  | 0,380  | 28,16  | 1,02   | 8,13   | 14,28  | 90,47  | 13,788  | 0,7  |      | 0,85 | 0,87 | 0,92 | 0,054  |
| FPO1012       | 2,31    | 0,75  | 1,72  | -0,51 | 2,53  | -0,082 | 44,43  | -9,05  | 14,96  | -34,46 | 38,5   | -3,727  | 0,72 | 0,72 | 0,59 | 0,73 | 0,66 | -0,011 |
| FPO1218       | 0,86    | 2,9   | 0,38  | 0,91  | 4,56  | 0,541  | -5,78  | 14,64  | -11,67 | -2,63  | 92,35  | 17,899  | 0,79 | 0,75 | 0,73 | 0,74 | 0,7  | -0,019 |
| HOK0010       |         |       |       |       |       |        |        |        |        |        |        |         | 1,11 | 0,97 | 0,93 | 0,95 | 1,12 | 0,000  |
| HOK1012*      | 5,6     | 0,1   | 2,24  | 1,15  | 1,28  | -0,759 | 138,14 | -29,82 | 35,25  | 4,41   | 10,41  | 8,985   | 0,56 |      | 0,49 | 0,51 | 0,55 | -0,004 |
| HOK1218       | 2,46    | 1,85  | 4,39  | 2     | 2,09  | -0,059 | 38,79  | 22,29  | 99,9   | 44,88  | 35,07  | 1,515   | 0,64 | 0,65 | 0,58 | 0,57 | 0,62 | -0,012 |
| HOK1824       | -0,23   | 1,66  | 2,99  | 1,5   | 2,78  | 0,586  | -33,24 | 28,78  | 68,26  | 17,22  | 52,57  | 16,006  | 0,75 | 0,78 | 0,76 | 0,75 | 0,76 | -0,001 |
| HOK2440       | 2,86    | 9,01  | 1,48  | 1,67  | 3,21  | -0,664 | 25,63  | 140,66 | 16,43  | 22,41  | 135,39 | 10,127  | 0,9  | 0,85 | 0,87 | 0,8  | 0,82 | -0,021 |
| HOK1218 LLD   |         |       |       |       |       |        |        |        |        |        |        |         | 1,07 | 1    | 1,06 | 1,17 | 1,23 | 0,049  |
| HOK1824 LLD   | 1,79    |       |       |       |       |        | 27,34  |        |        |        |        |         | 1,02 | 1,02 | 1,02 | 1,02 | 1,01 | -0,002 |
| HOK 2440 LLD* | 2,54    | 2,8   | 0,54  | 0,93  | 1,95  | -0,305 | 38,78  | 41,48  | -20,86 | -2,59  | 44,33  | -3,297  | 0,9  | 0,81 | 0,91 | 0,9  | 0,85 | -0,001 |
| PGP1824       |         |       |       |       |       |        |        |        |        |        |        |         | 1    | 1,01 | 1    | 1,00 | 1,01 | 0,002  |
| PGP2440*      | 1,56    | 1,15  | 0,72  | 0,26  | 0,95  | -0,106 | 34,76  | 11,67  | -14,97 | -43,67 | -1,9   | -2,944  | 0,88 | 0,93 | 0,91 | 0,92 | 0,91 | -0,006 |
| PMP0010       | 3,48    | 3,67  | 2,24  | 1,7   | 1     | -0,693 | 88,99  | 67,42  | 38,23  | 21,25  | 0,04   | -22,407 | 0,42 | 0,44 | 0,4  | 0,41 | 0,41 | -0,005 |
| PMP1012       | 7,26    | 8,01  | 3,58  | 1,87  | -1,46 | -2,358 | 62,01  | 42,19  | 126,07 | 47,94  | -67,6  | -25,347 | 0,54 | 0,58 | 0,5  | 0,54 | 0,58 | 0,004  |
| PMP1218       | 1,38    | 7,44  | -1,53 | 5,68  | 1,6   | -0,546 | 13,99  | 101,36 | -72,54 | 156,27 | 15     | -9,701  | 0,68 | 0,65 | 0,6  | 0,63 | 0,92 | 0,062  |
| PMP1824       |         |       |       |       |       |        |        |        |        |        |        |         | 1    |      |      |      |      |        |
| PS0010        |         |       |       |       |       |        |        |        |        |        |        |         | 0,94 | 0,93 | 0,88 | 1    | 1    | 0,019  |
| PS1012*       | 1,08    | 11,53 | 3,25  | 3,18  | 3,36  | -0,379 | 1,85   | 190,61 | 56,07  | 44,95  | 52,87  | -1,511  | 0,88 | 0,84 | 0,75 | 0,86 | 0,83 | -0,013 |
| PS1218        | 2,42    | 1,12  | 2,5   | 1,5   | 4,63  | 0,480  | 58,5   | 8      | 44,77  | 19,83  | 94,81  | 8,445   | 0,54 | 0,54 | 0,52 | 0,53 | 0,53 | -0,003 |
| PS1824*       | 1,64    | 2,64  | 2,12  | 1,89  | 2,42  | 0,081  | 16,35  | 59,01  | 38,17  | 33,51  | 50,34  | 4,248   | 0,6  | 0,64 | 0,64 | 0,63 | 0,63 | 0,005  |
| PS2440*       | 4,07    | 4,17  | 2,8   | 2,26  | 2,14  | -0,577 | 86     | 83,53  | 59,53  | 47,12  | 47     | -11,441 | 0,72 | 0,8  | 0,8  | 0,76 | 0,82 | 0,016  |

### Appendix 3: Evolution of the biological indicators of the Spanish fleet segments operating in the North Atlantic Ocean (2018 – 2024).

| Segment       | SHI  |      |      |      |      | SAR  |      |      |      |      |
|---------------|------|------|------|------|------|------|------|------|------|------|
|               | 2018 | 2019 | 2020 | 2021 | 2022 | 2018 | 2019 | 2020 | 2021 | 2022 |
| DFN0010       |      |      |      |      |      |      |      |      |      |      |
| DFN1012*      |      |      |      |      |      | 1    |      | 1    | 2    | 1    |
| DFN1218       | 1,28 |      |      |      |      | 2    |      | 2    | 3    | 1    |
| DFN1824*      | 1,48 | 1,86 | 1,98 | 0,89 | 0,72 | x    |      |      |      |      |
| DFN2440       |      | 1,26 | 1,3  | 0,89 | 0,69 |      |      |      |      |      |
| DRB0010       |      |      |      |      |      |      |      |      |      |      |
| DRB1012       |      |      |      |      |      |      |      |      |      |      |
| DRB1218       |      |      |      |      |      |      |      |      |      |      |
| DTS1012       |      |      |      |      |      |      |      |      |      |      |
| DTS1218*      |      |      |      |      |      | 3    |      | 1    | 2    | 1    |
| DTS1824       |      |      |      |      |      | 4    |      | 3    | 2    | 1    |
| DTS2440       | 1,32 | 1,05 | 1,05 | 0,92 | 0,85 | x    |      |      | 3    | 2    |
| DTS40XX       | 1,54 |      | 0,86 | 1,08 | 1,04 | x    |      | 6    | 5    | 5    |
| FPO1012       |      |      |      |      |      |      |      |      | 1    |      |
| FPO1218       |      |      |      |      |      |      |      |      |      |      |
| HOK0010       |      | 1,66 | 0,86 |      | 1,03 |      |      | 1    |      |      |
| HOK1012*      | 1,37 |      |      |      | 0,91 | 5    |      | 1    | 2    | 1    |
| HOK1218       | 1,36 |      |      |      | 0,81 | 6    |      |      | 2    | 1    |
| HOK1824       | 0,97 |      |      |      | 0,77 | 7    |      | 1    | 1    |      |
| HOK2440       | 0,76 |      |      |      | 0,72 |      |      |      |      |      |
| HOK1218 LLD   |      | 0,78 |      |      | 0,71 |      |      | 1    |      |      |
| HOK1824 LLD   | 0,84 | 0,78 |      |      | 0,81 |      |      | 1    |      | 1    |
| HOK 2440 LLD* |      | 0,8  |      |      | 0,79 |      |      | 2    |      |      |
| PGP1824       |      | 0,88 | 1,01 | 0,77 | 0,8  |      |      |      |      |      |
| PGP2440*      | 0,81 | 0,81 | 1    | 0,77 | 0,79 | 8    |      | 1    | 2    | 3    |
| PMP0010       |      |      |      |      |      |      | 9    |      | 9    | 2    |
| PMP1012       |      |      |      |      |      |      |      |      |      |      |
| PMP1218       |      |      |      |      |      |      |      |      |      |      |
| PS0010        |      |      |      | 1,16 | 1,14 |      |      | 3    |      |      |
| PS1012*       |      | 0,84 | 0,65 | 0,81 | 0,82 |      |      | 1    |      |      |
| PS1218        |      | 0,99 | 0,65 | 0,83 | 0,83 |      |      | 2    | 2    |      |
| PS1824*       |      | 1    | 0,9  | 0,88 | 0,99 |      |      |      |      |      |
| PS2440*       | 0,73 |      |      |      | 0,92 |      |      |      |      |      |

## Appendix 4: Questionnaire

| SPAIN – Northwestern Atlantic and Western Mediterranean Sea |                                                                                                                                                                                                                     |
|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Questions                                                   |                                                                                                                                                                                                                     |
| 1.                                                          | What are the <b>main drivers</b> behind reported changes in fleets <b>in balance</b> or <b>out of balance</b> over the <b>past 5 years</b> ?                                                                        |
| 2.                                                          | What are the causes of the current fleets in balance or out of balance situation (e.g. resources status, fisheries management measures, markets, BREXIT, EMFAF)?                                                    |
| 3.                                                          | What <b>current management decisions</b> have been adopted to <b>maintain</b> the fleet <b>in balance</b> (e.g. reduction of fishing capacity, flexibility in quota management, financial support, SWAPs)?          |
| 4.                                                          | Is the <b>permanent cessation program</b> effective at managing fleet balance? What are other solutions and why could these be effective?                                                                           |
| 5.                                                          | What is causing <b>inactivity in the fleets</b> and what management measures can be used to mitigate this?                                                                                                          |
| 6.                                                          | What <b>future opportunities and management measures</b> can be used to improve implementation of fleet balance indicators and how?                                                                                 |
| 7.                                                          | Specifically, what has been the <b>impact of the Western Mediterranean Multiannual Plan (MAP)</b> on the fleets in terms of sustainability of fisheries and stocks, viability of the fleets, and fleet performance? |
| 8.                                                          | Please explain how your country uses the <b>fleet capacity indicators</b> to manage the fleet.                                                                                                                      |

## 2.4 Case Study 4: Fisheries in the southern Baltic Sea – Polish example



Photo. M. Rakowski ©

Marcin Rakowski, Adam Mytlewski

National Marine Fisheries Research Institute (MIR-PIB)



## 18. Background

Recently, fishing fleets in the Baltic Sea have had to adapt to several new conditions, including an increase in fishing bans, species-specific exclusions, the expansion of marine protected areas (MPAs) as well as regulations such as total allowable catches (TACs) and a deteriorated economic situation. In addition, due to the decline and eventual complete cessation in 2019 of the most profitable cod fisheries (from the so-called eastern stock, ICES subdivisions 24-32), some vessels have had to switch target catches and search for other fish species. In consequence, trawl fleet segments with the appropriate authorisations began (or increased) exploitation of pelagic species such as sprat, using catch limits from the distribution of TACs allocated to Poland. To date, fleet segments with passive gear have targeted flatfish (not subject to TAC quotas), transitional water species and herring.

This case study aims to analyse recent trends in the Polish fishing fleet including changes in catch composition, realised fishing effort, economic and operational performance, and vessel migration between segments. As a member of the European Union (EU), Poland has implemented and applies the Common Fisheries Policy (CFP) in fisheries management. This is a set of rules for the management of European fishing fleets and the conservation of fish stocks. The main objective of fisheries management under the CFP is to ensure that high fishing efficiency can be achieved with the biological sustainability of as many fish stocks as possible in the long term. Another goal, which is of increasing importance, is to minimize or avoid bycatch species.

The principal legislation regulating fishing activities in Polish marine areas is a national act - the Act of 19<sup>th</sup> December 2014 on Maritime Fisheries (Dz.U. z 2024, poz. 243 i poz. 1222). This act implements regulations from the EU level within the Common Fisheries Policy. It defines the rules of sea fishing, and its provisions apply to, among others, fishing vessels of Polish nationality, performing sea fishing in the maritime areas of the Republic of Poland and beyond, foreign-flagged vessels fishing in the exclusive economic zone, legal and natural persons engaged in recreational fishing. The law comprehensively regulates fishing rights, the register of fishing vessels, technical limits (e.g., size of units, total capacity of the Polish fleet), special fishing permits, control of fishing and landings, and prevention of illegal, unreported and unregulated fishing.

Detailed conditions for the practice of sea fishing, including the type, number and design of fishing gear, the method of fishing, the detailed method of marking fishing gear, and the places and times of landing certain species of marine organisms, are defined by regulations set by the minister in charge of fisheries. The *Regulation of the Minister of Maritime Affairs and Inland Navigation of 21<sup>st</sup> August 2019 on the dimensions and protection periods of marine organisms and detailed conditions for commercial fishing* (Dz.U. z 2019, poz. 1701) limits fishing with trawled or towed gear depending on the distance from the shore and depth.

This restriction aims to assign marine areas for passive fishing gears carried out mainly by the small-scale coastal fishery. The regulation also determines temporal and spatial restrictions to manage specific species.

In the Baltic Sea, we see no or very slow recovery of the Western Baltic Sea herring and all cod stocks, although there has been no directed fishery for several years now <sup>(98)</sup>. Climate change also plays a larger role now than ten years ago. According to respondents from fisheries sector some stocks move north, causing species distribution to change. Other policies besides a stringent fleet policy should then be triggered, such as reducing the input of nutrients in the basin and limit oxygen-depleted areas (e.g. the Baltic Sea Action Plan).

This case study aims to determine the impact of these recent changes in the southern Baltic Sea on the possibility of continuing economic activity in the various segments of the Polish fishing fleet. It should be noted that the analyses prepared by the Polish Managing Authority (covering data for 2019-2023 in case of fleet balance, and 2015-2023 as Data Collection Framework – DCF aggregated results yearly reports) are impacted by factors such as the COVID-19 pandemic and Russia's unprovoked aggression against Ukraine. The scope of the study covers the activity of the Polish fishing fleet operating in the Baltic Sea.

#### 18.1. Overview of fleet capacity

The Polish fishing fleet in the Baltic Sea operates primarily in the southern part of the sea. Vessels up to 12 metres in length typically use passive gear and fish in locations close to their home ports. This makes the fleet particularly vulnerable to changes in resource availability, catch limitations, MPAs and other maritime restrictions.

At the end of 2023, the Polish fishing fleet operating in the open waters of the Baltic Sea, internal waters and the Vistula and Szczecin Lagoons consisted of 822 vessels, with a total tonnage of 15,913.33 GT and a total engine power of 62 869.92 kW. Compared to 2022 and previous years, the number of fishing vessels in the Polish fleet remained unchanged. However, in December 2023, a call for applications for permanent cessation with compensation was started, which significantly reduced the fleet size to 718 vessels by the end of 2024, with further reductions in 2025. As of the end of first quarter 2025, the European Fishing Vessel Register listed 690 vessels remaining in the Polish fleet.

Despite the relatively stable number of vessels in the Polish fishing fleet between 2014 and 2023, there were minor changes in fleet capacity and engine power.

---

<sup>(98)</sup> Ban on cod commercial fishery began with implementation of Commission Implementing Regulation (EU) 2019/1248 of 22 July 2019 establishing measures to alleviate a serious threat to the conservation of the eastern Baltic cod (*Gadus morhua*) stock, as realization of recovery plan

These changes were primarily due to shipowners replacing older vessels, modernisation, and other related factors. Changes in the total size of the Polish fishing fleet are shown in the table below (Table 47).

**Table 47 – Changes in Polish fishing fleet size, GT and kW in years 2014-2023**

| Year | Number | GT     | kW     |
|------|--------|--------|--------|
| 2014 | 870    | 16 783 | 66 947 |
| 2015 | 872    | 16 965 | 66 954 |
| 2016 | 839    | 16 153 | 63 157 |
| 2017 | 831    | 15 979 | 62 571 |
| 2018 | 825    | 15 947 | 62 827 |
| 2019 | 825    | 15 925 | 62 820 |
| 2020 | 821    | 15 982 | 62 972 |
| 2021 | 821    | 16 021 | 63 220 |
| 2022 | 822    | 16 026 | 63 313 |
| 2023 | 822    | 15 913 | 62 870 |

Source: European Fishing Fleet Register, [https://webgate.ec.europa.eu/fleet-europa/index\\_en](https://webgate.ec.europa.eu/fleet-europa/index_en)

Fishing opportunities in the Baltic Sea are regulated by relevant international institutions. For EU Member States, this competence lies with EU institutions. Previously, these matters were overseen by the International Baltic Sea Fishery Commission (IBSFC), a regional organization established to manage fisheries in the Baltic Sea and Belts, which operated from 1974 to 2005. The IBSFC finished its activities on 31<sup>st</sup> December 2005, following the withdrawal of the European Union.

Catch limits in the Baltic Sea, managed through total allowable catches (TACs), are set annually by the European Union to ensure sustainable management of fish stocks. In 2024, the total fishing opportunities in the Baltic Sea, including those allocated to Poland, were established under Council Regulation (EU) 2023/2638 <sup>(99)</sup> (Table 48).

<sup>(99)</sup> OJ L, 2023/2638, ELI: <http://data.europa.eu/eli/reg/2023/2638/oj>

**Table 48 – Total Allowable Catches (TAC) in the Baltic Sea for 2024**

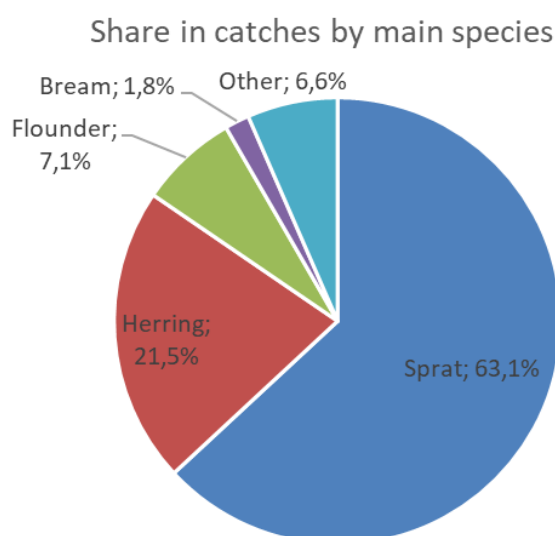
| Species                                          | Total TAC        | Poland TAC      |
|--------------------------------------------------|------------------|-----------------|
| Cod (subdivision 22-24)*                         | 340 t            | 40 t            |
| Cod (area 25-32)*                                | 595 t            | 159 t           |
| Herring (subdivision 22-24)*                     | 788 t            | 103 t           |
| Herring (subdivision 25-29, except Gulf of Riga) | 40 368 t         | 10 057 t        |
| Sprat (subdivision 22-32)                        | 201 000 t        | 59 013 t        |
| Plaice (subdivision 22-32)                       | 11 313 t         | 1 697 t         |
| Salmon (subdivision 22-31)*                      | 53 967 specimens | 3 393 specimens |

\*fishing quotas for by-catch only

Source: own elaboration based on Council Regulation (EU) 2023/2638)

With cod fishing now at very low levels, the primary species caught by Polish fishermen in the Baltic Sea are now sprat, herring, flatfish and whiting, as well as freshwater species from brackish waters such as bream, roach, perch and stickleback. The species composition of catches in the Baltic Sea is dominated by pelagic fish - sprats and herring and flounder.

In 2023, Polish catches in the Baltic Sea amounted to 95.4 thousand tonnes. Of those subject to catch limits, total annual catches were sprat (60 178.3 t, 63.1% of the volume of Baltic catches of the Polish fleet), herring (20 469.2 t, 21.5%), plaice (183.9 t, 0.2%) and cod (148.3 t, 0.2%). In addition, for non-quota (unlimited) species in 2023, the largest catches were flounder (6 794 t, 7.1%), bream (1 692.5, 1.8%) and stickleback (1 327.0, 1.4%) (Figure 35).

**Figure 35 – Share of catches of Polish Baltic Sea fishing fleet in 2023 by main species**

Source: own elaboration based on Data from Fisheries Monitoring Centre of Department of Fisheries of Ministry of Agriculture and Rural Development (CMR).

## 18.2. Aims and objectives

The purpose of this study is to present the status and main trends in fisheries management in the Baltic Sea region, using Poland as a case study, with a focus on the sustainability of fish stocks and fleet segments between 2015 and 2023.

The study will address the biological sustainability of fish resources, as well as the economic and technical sustainability of the fleet and its individual segments. It will also examine the causes of existing imbalances occurring and the measures taken to contribute to the successful sustainability of fishing capacity.

## 19. Methodology

### 19.1. General approach

The review of studies and other sources of information on the functioning of fisheries in Poland, fisheries management practices, and the socioeconomic parameters of the fishing fleet was conducted through consultations with experts involved in advisory services, as well as through direct engagement with personnel responsible for fisheries management at the Ministry of Agriculture and Rural Development (MARD). This method proved most effective, as it enabled access to unpublished information and incorporated expert's insights and authors' comments.

The analysis of collected information and data sources enabled a systematic organisation of the material and allowed the adoption, in this study, of a classification of the Polish fishing fleet into segments based on dominant fishing techniques and vessel length. The adopted division into 7 fleet segments, sometimes being clusters aggregating single units or few segments, is used in both national studies and comparisons within the Scientific, Technical and Economic Committee for Fisheries (STECF). In this study, it is also used to describe the fleet's balance with fishing opportunities.

Information obtained from reports was supported by data from MARD and the European Fishing Fleet Register. These data were validated with findings from interviews conducted with regional stakeholders.

### 19.2. Data and information sources

A survey of the available literature on the potential of the Polish fleet in the Baltic Sea has been carried out, as well as an analysis of available documents and databases. The main data sources for describing the balance of the Polish Baltic fishing fleet by segment were the reports prepared for the STECF and, above all, the annual reports "on actions to achieve a balance between fishing capacity and fishing opportunities" from 2020-2024. Aggregated statistical data on the economic performance of the Polish fishing fleet in consecutive years, obtained from prepared in National Marine Fisheries Research Institute (NMFRI) reports for MARD summarizing the results of the Data Collection Framework (DCF), were

also used. For the better understanding of the process the Baltic Sea Advisory Council (BSAC) Recommendations on the EU Action Plan report <sup>(100)</sup> was reviewed.

These studies are a compendium of the latest available information on the fleet, its adjustment to available resources, and in particular contain biological, economic and technical indicators of balance by individual segments of the Polish Baltic fishing fleet, based on official data as well as an action plan for management. These studies also identify the main international, Community and national legal and regulatory acts supporting fisheries management, regulating access to resources and fishing opportunities.

Also used were catch databases obtained from the Fisheries Monitoring Center of the Department of Fisheries of the Ministry of Agriculture and Rural Development (CMR), the European Fishing Fleet Register, socioeconomic data obtained from the DCF.

### 19.3. Stakeholder consultation

Based on data from the review of collected information on Polish fishing fleet management and most important stakeholders, a case study interview scenario/survey questionnaire was prepared (Appendix 1). The first analysis showed that selection of the key stakeholders prepared with local experts should result with 8-10 experts' interviews from the field of fisheries industry, science, government or other governmental entities.

Stakeholders consist of representatives of biggest Producer Organizations/ Fishermen Associations (4 surveys), Managing authorities (Deputy Director in Fisheries Department of Ministry of Agriculture and Rural Development; Head of Fleet control Department; Head of CMR), Head of DCF programme with his team.

In total there were 8 questionnaires collected, 4 as in person and 2 as on-line interviews and in 2 cases respondents asked for questions, answered them during internal meeting and resend the questionnaire (Table 33).

---

<sup>(100)</sup> <https://www.bsac.dk/wp-content/uploads/2023/12/BSACrecommendationsAP-2023-2024-35.pdf>

**Table 49 – List of key stakeholder groups relevant to fisheries exploiting South Baltic Sea**

| Institution  | Relevance for the project                            | No of Questionnaires | People involved |
|--------------|------------------------------------------------------|----------------------|-----------------|
| MARD         | Monitoring of catches (CMR)                          | 1                    | 1               |
| MARD         | Supervisor of fleet                                  | 1                    | 1               |
| MARD         | Management of the Fishery/representative in BaltFish | 1                    | 1               |
| DCF          | DCF National Correspondent                           | 1                    | 1               |
| PO           | Professional                                         | 1                    | 2               |
| PO           | Professional                                         | 1                    | 1               |
| PO           | Professional                                         | 1                    | 1               |
| PO           | Professional                                         | 1                    | 2               |
| <b>Total</b> |                                                      | <b>8</b>             | <b>10</b>       |

Source: own elaboration

## 20. Results

### 20.1. Review of reports and other available sources

The basis for obtaining information on the Polish fishing fleet in the Baltic Sea was the report prepared by MARD for the STECF, and STECF reports for all European Union countries (STECF, 2023, 2024a,b,c). The latter reports focused on describing the status and trends of various Polish fleet segments over a three-year period between 2020 and 2022. These trends included biological indicators: the Sustainable Harvest Indicator (SHI), Stock-at-risk indicator, (SAR); economic: Current-Revenue Ratio (CR/BER), Return on Investment (ROI); technical: Vessel Utilization Rate (VUR) in kW-days and GT-days, and Inactive Fleet Indicator. A summary of these indicators has been provided in Table 50 below.

In each annual fleet capacity report prepared for the Polish Ministry, the interpretation of biological indicator results for individual fleet segments assesses the sustainability of the catch (SHI) over a three-year period. This assessment covers all fleet segments although it is limited to TAC-regulated species for which a maximum sustainable fishing mortality ( $F_{MSY}$ ) rate could be established on ICES assessments (i.e. Western Baltic cod, Western and Central Baltic herring, Baltic Sea sprat and plaice). Based on the data from annual reports on measures to achieve a balance between fishing capacity and fishing opportunities for years 2020, 2021, 2022, and 2023 <sup>(101)</sup>, three fleet segments (VL0008PG, VL0812PG and VL1218DFN) recorded a share of these species below 40% of the total catch value. Consequently, for these segments, SHI results were considered as 'unavailable', although they were presented in the report and in the table below.

In addition, between 2021-2023, there were no fleet segments in which landings of stocks at risk (SAR) (Western Baltic herring and both cod stocks) exceeded

<sup>(101)</sup> <https://www.gov.pl/web/rolnictwo/raporty-flotowe>



10% of the of the segment's landings. Only in isolated cases did individual segments exceed a 10% share of catches from a stock at risk. Furthermore, fleet segment VL1218DTS was most reliant on stocks at risk and had a SAR indicators of 2 every year during the period 2021-2023 (Table 50). For both SHI and SAR indicators, the calculated values show a decreasing trend over time. Overall, these findings suggest that sustainability within the Polish Baltic fishing fleet has remained relatively stable.

Economic indicators showed that only pelagic trawl fleet segments (VL1218TM, VL1824TM and VL2440TM) were profitable during 2021-2023. In 2023, due to the timeframe of process of collection of economic data ROI and CR/BER indicators refers to 2022. ROI values were negative in segments VL0008PG, VL0812PG, VL1218DFN and VL1218DTS. Such values indicate that fishing capacity is not balanced. The analysis of the CR/BER indicator shows that the vessels of the above-mentioned segments do not generate revenues that would cover the costs incurred for conducting activities.

The reference threshold for the VUR indicates that a fleet capacity utilisation below 70% suggests that the fleet is unbalanced resulting from excessive fishing effort. Based on the results obtained, none of the fleet segments exceeded this reference value. Only two segments (VL1218TM and VL2440TM) recorded VUR values higher than 50%. Data from previous years indicate a stable trend in VUR values until the end of 2023.

According to stakeholder consultations, most cases of vessel inactivity are related to renovation, modernisation works, health-related issues of vessel owner, or changes in vessel ownership, including inheritance and legal succession processes. Difficulties in recruiting crew was mentioned only once. Vessel inactivity was not found to be directly linked to economic performance. Feedback from representatives of Producers Organizations, indicates that older vessel owners owning regard vessel ownership or occasional trips as an extension of their professional activity, while anticipating that their successors will formally declare their intention to continue the vessel operations. Given the reference value for determining fleet imbalance in this context is 20%, the results indicate that none of the Polish fleet can be considered imbalanced.

In summary, the catches of TAC-regulated species do not contribute to an increase in biological imbalance. However, the current value of catches does not allow for positive financial results from fishing activities in segments other than those using pelagic trawl gear. This analysis also showed that the utilisation of fishing capacity across all fleet segments below the reference threshold. The corresponding indicator values are shown in the table below.

Table 50 – Fleet balance indicators in 2018-2023

| Indicator  | VL0008 PG | VL0812 PG | VL1218 DFN | VL1218 DTS | VL1218 TM | VL1824 TM | VL2440 TM |
|------------|-----------|-----------|------------|------------|-----------|-----------|-----------|
| 2023       |           |           |            |            |           |           |           |
| SHI        | 0.87      | 0.81      | 1.01       | 1.01       | 0.94      | 1.00      | 0.99      |
| SAR        | 0         | 1         | 0          | 2          | 1         | 1         | 1         |
| ROI*       | -11.9%    | -11.7%    | -9.3%      | -6.1%      | 5.7%      | 7.8%      | 9.2%      |
| CR/BER*    | -1.75     | -1.91     | -2.50      | -0.13      | 1.86      | 2.22      | 2.28      |
| VUR kWdays | 28%       | 27%       | 42%        | 43%        | 62%       | 44%       | 59%       |
| VUR GTdays | 29%       | 25%       | 38%        | 40%        | 56%       | 45%       | 60%       |
| Inactivity | 1%        | 4%        | 13%        |            | 16%       | 3%        |           |
| 2022       |           |           |            |            |           |           |           |
| SHI        | 0.88      | 0.68      | 0.98       | 0.82       | 0.93      | 0.99      | 0.99      |
| SAR        | 1         | 0         | 0          | 2          | 2         | 2         | 1         |
| ROI        | -8.11%    | -16.31%   | -12.53%    | 5.01%      | 4.33%     | 11.41%    | 5.26%     |
| CR/BER     | -1.31     | -3.21     | -5.14      | 1.90       | 1.69      | 3.60      | 1.85      |
| VUR kWdays | 34%       | 32%       | 50%        | 52%        | 68%       | 49%       | 58%       |
| VUR GTdays | 33%       | 33%       | 50%        | 52%        | 61%       | 50%       | 59%       |
| Inactivity | 4%        | 12%       | 9%         |            | 13%       | 4%        |           |
| 2021       |           |           |            |            |           |           |           |
| SHI        | 1.60      | 1.40      | 1.3        | 1.06       | 1.15      | 1.22      | 1.26      |
| SAR        | 1         | 1         | 0          | 2          | 1         | 1         | 1         |
| ROI        | -19.43%   | -16.79%   | -13.89%    | -0,40      | 30.34%    | 8.47%     | 11.16%    |
| CR/BER     | -4.97     | -2.87     | -3.03      | -10,90     | 5.22      | 2.34      | 2.51      |
| VUR kWdays | 35%       | 41%       | 51%        | 59%        | 66%       | 44%       | 67%       |
| VUR GTdays | 34%       | 40%       | 52%        | 60%        | 61%       | 45%       | 69%       |
| Inactivity | 2%        | 2%        | 8%         |            | 6%        | 2%        |           |
| 2020       |           |           |            |            |           |           |           |
| SHI        | 1.91*     | 1.92*     | 1.31*      | 1.50*      | 1.36      | 1.63      | 1.65      |

| Indicator  | VL0008 PG | VL0812 PG | VL1218 DFN | VL1218 DTS | VL1218 TM | VL1824 TM | VL2440 TM |
|------------|-----------|-----------|------------|------------|-----------|-----------|-----------|
| SAR        | 1         | 0         | 0          | 2          | 1         | 0         | 1         |
| ROI        | -7.10%    | -3.20%    | -18.00%    | -1.60%     | 5.90%     | 4.40%     | 16.20%    |
| CR/BER     | -0.6      | 0,3       | -3.8       | 0.8        | 1,8       | 1,7       | 3         |
| VUR kWdays | 15%       | 33%       | 49%        | 55%        | 36%       | 51%       | 64%       |
| VUR GTdays | 16%       | 34%       | 48%        | 54%        | 36%       | 52%       | 67%       |
| Inactivity | 3%        | 1%        | 4%         |            | 7%        | 4%        |           |
| 2019       |           |           |            |            |           |           |           |
| SHI        | 2.53      | 2.78*     | 3.16       | 2.64       | 2,46      | 1.93      | 1,75      |
| SAR        | 1         | 1         | 1          | 2          | 1         | 1         | 1         |
| ROI        | -16.40%   | 1.90%     | -3.50%     | 7.70%      | -5.30%    | 16.80%    | 12.50%    |
| CR/BER     | -3.5      | 1.35      | 0,04       | 2          | 0,7       | 4,1       | 2,7       |
| VUR kWdays | 42%       | 47%       | 31%        | 53%        | 64%       | 54%       | 60%       |
| VUR GTdays | 39%       | 47%       | 31%        | 53%        | 65%       | 58%       | 60%       |
| Inactivity | 4%        | 11%       | 4%         |            | 9%        | 2%        |           |
| 2018       |           |           |            |            |           |           |           |
| SHI        | 2.51      | 2.68      | 2,82       | 2.54       | 2.33      | 1.84      | 1,7       |
| SAR        | 1         | 2         | 2          | 2          | 2         | 1         | 1         |
| ROI        | -8.1%     | -4.60%    | 0.90%      | 5.30%      | 3.30%     | 16.80%    | 11.20%    |
| CR/BER     | -1.4      | -0.1      | 1,1        | 1,7        | 1,3       | 4,3       | 2,3       |
| VUR kWdays | 38%       | 41%       | 47%        | 60%        | 58%       | 49%       | 66%       |
| VUR GTdays | 37%       | 42%       | 46%        | 60%        | 58%       | 53%       | 66%       |
| Inactivity | 5%        | 14%       | 7%         |            | 4%        | 0%        |           |

\* Economic indicators refer to 2022 due to availability of data from DCF

Source: own elaboration based on data from Polish fleet capacity report on measures to achieve a balance between fishing capacity and fishing opportunities for the period from 1<sup>st</sup> January 2018 to 31<sup>st</sup> December 2023. For those years and segments highlighted in red, the SHI indicator can be considered unavailable, although has been calculated and included in this table.

## 20.2. Results of the stakeholders' consultation

The consultation process with sector stakeholders provided new information and allowed to see differences in perceptions of the same phenomena affecting fleet balancing. Due to these differences and a better understanding of the description of the various questions, the opinions of these parties will sometimes be presented separately.

The main factors affecting the sustainability of the fleet segments were generally perceived to be the insufficient availability of fish stocks (especially profitable cod) and the rapidly increasing cost of running the business. Fishermen's representatives here also pointed to large fluctuations in the size of allocated fishing rights, resulting, in their view, from poor scientific advice, which in turn leads to poor management decisions and economic instability. Annual changes in the limits for central herring (-42% in 2024 and +108% in 2025) were cited as an example. Representatives of the managing and monitoring institution pointed to quantity restrictions resulting from conservation, internal competition, market advantage of intermediaries resulting in low first-sale prices, technological underdevelopment in the automation of the process of catches and landings.

According to fishermen, the reasons for such a situation with regard to the balance of the fleet are climate change and related environmental factors, over-protection of seals and cormorants, as well as poor, inflexible management of resources and funds from Operational Programs for Fisheries. They pointed to decisions and regulations that are incomprehensible and illogical in the opinion of fishermen. They indicated the trap of not being able to compensate for the permanent cessation of fishing effort for shipowners affected by the cod ban (resulting in a lack of an adequate number of fishing days). Representatives of the fishing industry pointed to excessive fishing effort, which has so far been supported by misguided regulations that promote low-volume marginal activity within small scale fisheries. On the management side, the reason is perennial overfishing, environmental factors and market conditions when the price of fish is shaped at global levels. An important reason for the unsustainability of fleet segments is the poor quality of reports collected by the DCF resulting in low representativeness of the actual economic situation of the fishery.

When asked about management decisions taken to achieve fleet sustainability, fishermen pointed to a program initiated in 2024 (actually, the first calls were made in December 2023) to reduce fleet potential by permanently limiting effort, mentioned temporary exclusions, but also assistance in increasing the limit through international exchanges and exchanges between shipowners (SWAPs) allowing optimization of catches. Respondents on the part of fishery managers also mentioned the possibility of obtaining subsidies to diversify operations allowing additional income.

Permanent cessation of fishing activity was considered by all respondents as a good remedy for achieving fisheries sustainability, extremely effective and quickly

improving fishing economics. However, fishermen noted the lack of a noticeable effect with previous effort reduction programs using loopholes and the introduction of new vessels (an amendment to the regulations eliminated this problem, but replacing a large vessel with several smaller ones without increasing GT and kW did occur). As an additional solution, they suggested making the transfer of fishing quotas between shipowners more flexible. The management side showed more concern for social and economic costs in the long term and the increase in infrastructure maintenance costs. They pointed to the need to analyse the results of the program and simulate the future with the possible recovery of stocks (especially cod). An alternative to a small fleet could be the promotion of selective gear, diversification of operations and reorganization of the local market.

The legislation regulates shipowners whose vessels have been inactive for extended periods to lose their right to fishing quota, effectively eliminating such vessels. In Poland, a permanently inactive fleet is not considered a problem, as a vessel owner has never had an inactive vessel for such a period. However, this inactivity is an obvious under-exploitation of the fleet's potential and producer organizations make a living from the activities of their members.

As new management measures to improve the sustainability of the fleet, fishermen suggest introducing multi-year catch limits to plan income (and investment), making the exchange of limits more flexible, and introducing regulations to promote fishing for human consumption. Respondents from the fisheries management side also noted the need to develop a way to exchange limits flexibly, quotas for producer organizations, introduce ITQs, and increase the efficiency of fisheries control while loosening regulations governing technical measures.

Managing the capacity limit in Poland is achieved by enforcing control of the fleet, fishing gear, catches and landings, monitoring performance, and improving the reporting system.

The question of using fleet indicators for management was most fully answered by respondents responsible for monitoring and control. They mentioned the great importance of annual studies of the state of fleet sustainability for management decisions and programs implemented.

## 21. Discussion

Analysis of acquired scientific studies and STECF reports showed that the pressure from the fleet does not pose a threat to the adopted stock rebuilding program. Biological indicators have not shown that any of the fleet segments is contributing significantly to the unsustainability of the stock in relation to the adopted maximum harvest volumes.

The technical indicators also do not clearly indicate that any particular segment of the fleet is unsustainable, although the utilisation of each segment's potential in both GT.days and kW.days, which has remained below the reference 70% for many years, can be perceived as an indication of unsustainability.

The values of economic indicators for the segments fishing with passive gear and bottom trawls had negative values in analysed year. These are segments traditionally earning most of their income from the sale of cod catches. Changing the focus of fishing may not be possible in these cases due to technical limitations, shortages of fishing rights for other limited species or lack of liquidity to replace gear. Meanwhile, the 3 segments of pelagic trawl vessels, thus relying mainly on sprat and herring fishing, have ROA and CR/BER ratios that are very good, despite the large underutilisation of potential. This indicates a large disparity in income generation, a high dependence of fishing on allocated pelagic fish limits, and the reliance of part of the fleet on unlimited species, which are not very profitable.

The conclusions of the annual report on measures to achieve a balance between fishing capacity and fishing opportunities for the period from 1<sup>st</sup> January to 31<sup>st</sup> December 2023, for each segment state that segments VL0008PG, VL0812PG, VL1218DFN and VL1218DST are permanently economically and technically unsustainable, while segments VL1218TM, VL1824TM and VL2440TM are partially or close to sustainable and can be considered sustainable.

Following the article 22.1 of the Regulation (EU) No. 1380/2013 of the European Parliament and of the Council on the Common Fisheries Policy. In 2022, an action plan was developed, setting out the conditions for achieving long-term sustainability over an 8-10 year horizon. Specific targets were set for all segments of the fleet and fish stocks. Based on scientific advice, legal analysis and public consultation, tools for achieving sustainability were developed. The plan is described in the 2022 report. It adopted 3 main goals:

1. Reduce the number of boats in permanently inefficient and unsustainable segments to a level that ensures an increase in fishing efficiency in deficit segments and stabilization of the financial health of these segments.
2. To develop a system for the distribution of fishing quotas allocated to Poland in a manner oriented toward achieving biological sustainability.

### 3. Improving methods and tools for data collection, analysis and modelling of the economic and biological performance of the Baltic fleet <sup>(102)</sup>.

As an Action Plan, Poland proposed to develop a TAC allocation quota system to achieve biological balance and reduce fleet segment size within the next 5 years for PG, TM, and DTS fleets. All proposed measures should be accompanied by modelling to examine typical vessels within a 3 to five-year time frame. On these measures, STECF states that it *“is unable to assess the extent to which the measures in the action plan are likely to redress the imbalance in the fleet segments concerned”* but confirmed that the revised action plan would affect 827 vessels and permanently terminate the activity of 213 vessels.

Vessel use indicators were only partially provided by Poland in their report, and VUR was just reported as kWdays or GTdays, denoting a different methodology from STECF, which also states that *“No comparison with trends estimated by the EWG 23-13 could be undertaken”* by experts. Nevertheless, the Action Plan also addresses the need to reduce the vessel number to improve the performance and balance of the Polish fleet. Indeed, the plan proposed to reduce *number of vessels in permanently inefficient and imbalanced segments to a level which ensures an increase in efficiency in segments operating at a deficit and stabilises the financial condition of those segments* <sup>(103)</sup>.

Recommendation of BSAC recognize the problem of rapid environmental changes and states, that *Science should make more effort to solve the problems of regime shift in the Baltic and species interrelations. There is a need for a more substantial reflection on socio-economic aspects, and the future of the fisheries and Fisheries management should follow rapid changes in the ecosystem. It is important to have an adaptive and fast decision-making process at regional level.* <sup>(104)</sup>

Stakeholders consulted referred to specific thematic issues based on their own experience, and their responses also stemmed from their position in the system. Members of producer organizations responded from the point of view of their members, those who are directly economically dependent on appropriate fisheries management policies. Those responsible for management and monitoring demonstrated their knowledge of fishermen's problems, pointed to actions taken and opportunities, but avoided declarations.

---

<sup>(102)</sup> Annual report on measures to achieve a balance between fishing capacity and fishing opportunities for the period from January 1 to December 31, 2021.

<sup>(103)</sup> Ibid.

<sup>(104)</sup> <https://www.bsac.dk/wp-content/uploads/2024/07/BSACrecommendationsfisheryBalticin2025.pdf>



## 22. Conclusions and recommendations

Polish fisheries are managed in accordance with legal regulations adapted to the guidelines of European Union legislation. The system of control and adjustment of regulations is based on scientific advice and biological, technical, economic and social data from annual reports prepared on the basis of properly collected data.

The countermeasures for unsustainable segments of the fishing fleet identified in the Action Plan will be implemented under the European Maritime, Fisheries and Aquaculture Fund. The reduction of the capacity of the fishing fleet will be implemented through permanent cessation of fishing activities, as referred to in Article 20 of Regulation (EU) 2021/1139 of the European Parliament and of the Council of 7<sup>th</sup> July 2021 establishing the European Maritime, Fisheries and Aquaculture Fund and amending Regulation (EU) 2017/1004.

The analysis of the feedback received through the questionnaires provided the following key messages:

- **Protecting stocks by assessing sustainable fishing mortality and limiting catches is achieving the expected results:** Reports indicate the beneficial effects of limiting catch volumes with proper monitoring and control.
- **Continued efforts should be made to contribute to reducing the economic and technical unsustainability of the fleet:** past effort to conserve resources by permanently withdrawing certain fleet potential will have a positive impact on the profitability of fishing activities. This process began in 2024, and by the end of March 2025, more than 130 vessels had been withdrawn from the Register.
- **Annual catch limit estimations would need to be more stable.** The need for relative stabilization of catch limits was highlighted by several respondents from the industrial sector. This concerned the role of long-term resource availability in estimating the return on investment: Major annual changes in catch limits do not allow for planning activities and making investments on vessels over a multi-year period. Expenditures on fishing infrastructure are high and require planning for return on investment. Adjusting fleet capacity to fishing opportunities is only one factor in economic balancing.
- **Consideration should be given to greater flexibility in the disposition of individual fishing rights:** The possibility of simply transferring part of the fishing rights of species subject to limits will contribute to more efficient use of the fleet's potential and better economic results. An issue for discussion is the form of achieving such flexibility (ITQs or assignments) and the adaptation of tools for control and monitoring of catches.

## 23. References

- BSAC Recommendations on the EU Action Plan: Protecting and restoring marine ecosystems for sustainable and resilient fisheries 04th December 2023 Ref: BSAC/2023-2024/35, <https://www.bsac.dk/wp-content/uploads/2023/12/BSACrecommendationsAP-2023-2024-35.pdf>
- BSAC reply to the European Commission open feedback on the proposed changes to the Baltic Multiannual Plan (MAP) 29th January 2024 Ref: BSAC/2023-2024/38 <https://www.bsac.dk/wp-content/uploads/2024/01/BSACanswerBalticMAPfeedback22-23-38.pdf>
- BSAC recommendations for the fishery in the Baltic Sea in 2025. 05<sup>th</sup> of July 2024, <https://www.bsac.dk/wp-content/uploads/2024/07/BSACrecommendationsfisheryBalticin2025.pdf>
- Commission Implementing Regulation (EU) 2019/1248 of 22 July 2019 establishing measures to alleviate a serious threat to the conservation of the eastern Baltic cod (*Gadus morhua*) stock, C/2019/5347, OJ L 195, 23.7.2019, pp. 2–4, [https://eur-lex.europa.eu/eli/reg\\_impl/2019/1248/oj/eng](https://eur-lex.europa.eu/eli/reg_impl/2019/1248/oj/eng)
- Raport roczny dotyczący działań zmierzających do osiągnięcia równowagi pomiędzy zdolnością połowową a wielkością dopuszczalnych połowów za okres od dnia 1 stycznia do dnia 31 grudnia 2023 r. (Report on actions to achieve a balance between fishing capacity and fishing opportunities from 1st of January 2020 to 31th of December 2023) <https://www.gov.pl/attachment/d1ebd094-a2ce-48bf-a385-1fcafe11e995>
- Raport roczny dotyczący działań zmierzających do osiągnięcia równowagi pomiędzy zdolnością połowową a wielkością dopuszczalnych połowów za okres od dnia 1 stycznia do dnia 31 grudnia 2022 r. (Report on actions to achieve a balance between fishing capacity and fishing opportunities from 1st of January 2020 to 31th of December 2022) <https://www.gov.pl/attachment/2301b4de-a1aa-4ec3-9485-9337fbfcbe0f>
- Raport roczny dotyczący działań zmierzających do osiągnięcia równowagi pomiędzy zdolnością połowową a wielkością dopuszczalnych połowów za okres od dnia 1 stycznia do dnia 31 grudnia 2021 r. (Report on actions to achieve a balance between fishing capacity and fishing opportunities from 1st of January 2020 to 31th of December 2021) <https://www.gov.pl/attachment/954393d5-ebec-4e20-8cfe-e98b950b8768>
- Raport roczny dotyczący działań zmierzających do osiągnięcia równowagi pomiędzy zdolnością połowową a wielkością dopuszczalnych połowów za okres od dnia 1 stycznia do dnia 31 grudnia 2020 r. (Report on actions to achieve a balance between fishing capacity and fishing opportunities from 1st of January to 31th of December 2020) <https://www.gov.pl/attachment/4044eead-8ccc-4c2f-a613-a3d133e7e5f7>
- STECF (Scientific, Technical and Economic Committee for Fisheries), 2023. Evaluation of Joint Recommendations on the landing obligation and on Technical Measures Regulation (STECF-23-04 & 23-06). Rihan D., Grati F., Ligas A., Doerner H., Vasilakopoulos P. (eds.). Publications Office of the European Union, Luxembourg, 2024, <https://data.europa.eu/doi/10.2760/447445>, JRC136341
- STECF (Scientific, Technical and Economic Committee for Fisheries), 2024a. Monitoring the Performance of the Common Fisheries Policy (STECF-Adhoc-24-01), GRAS, M., PIERUCCI, A., MANTOPOULOU PALOUKA, D., KUPSCHUS, S. and KONRAD, C. editor(s), Publications Office of the European Union, Luxembourg, 2024,

[https://publications.jrc.ec.europa.eu/repository/bitstream/JRC137731/JRC137731\\_01.pdf](https://publications.jrc.ec.europa.eu/repository/bitstream/JRC137731/JRC137731_01.pdf), JRC137731.

STECF (Scientific, Technical and Economic Committee for Fisheries), 2024b. 75th Plenary Report (STECF-PLN-24-01), RIHAN, D. and DOERNER, H. editor(s), Publications Office of the European Union, Luxembourg, 2024, [https://publications.jrc.ec.europa.eu/repository/bitstream/JRC137730/JRC137730\\_01.pdf](https://publications.jrc.ec.europa.eu/repository/bitstream/JRC137730/JRC137730_01.pdf), JRC137730.

STECF (Scientific, Technical and Economic Committee for Fisheries), 2024c. The 2024 Annual Economic Report on the EU Fishing Fleet (STECF-24-03 & STECF-24-07), Prelezo, R., Sabatella, E.C., Virtanen, J., Tardy Martorell, M., and Guillen, J. editor(s), Publications Office of the European Union, Luxembourg, 2024, <https://data.europa.eu/doi/10.2760/5037826>, JRC139642.

## Appendix 1: Stakeholder questionnaire

### Case Study: Fisheries in the southern Baltic Sea – Polish example

1. What are the **main drivers** behind reported changes in fleets **in balance** or **out of balance** over the **past 5 years**?
2. What are the **causes** of the **current** fleets **in balance** or **out of balance** situation (e.g. resources status, fisheries management measures, markets, BREXIT, EMFAF)?
3. What **current management decisions** have been adopted to **maintain** the fleet **in balance** (e.g. reduction of fishing capacity, flexibility in quota management, financial support, SWAPs)?
4. Is the **permanent cessation program** effective at managing fleet balance? What are other solutions and why could these be effective?
5. What is causing **inactivity in the fleets** and what management measures can be used to mitigate this?
6. What **future opportunities and management measures** can be used to improve implementation of fleet balance indicators and how?

## 2.5 Case Study 5: Demersal mixed fisheries in the Greater North Sea

Belgium, Denmark, Germany and The Netherlands

Hanne De Rijcke<sup>1</sup>, J. Rasmus Nielsen<sup>2</sup>, Lennert van de Pol<sup>3</sup>, Erik Sulanke<sup>4</sup>,  
Adelbert De Clercq<sup>1\*</sup>

<sup>1</sup> Flemish Research Institute for Agriculture, Fisheries and Food (ILVO), Ostend, Belgium

<sup>2</sup> Technical University of Denmark (DTU), National Institute of Aquatic Resources (DTU-Aqua), Henrik Dams Allé, Building 201, Office 047, DK-2800 Kgs. Lyngby,

<sup>3</sup> Wageningen Marine Research, PO Box 68, 1970 AB IJmuiden, The Netherlands

<sup>4</sup> Institute of Sea Fisheries, Thünen Institute, Bremerhaven, Germany

\* Case study leader

## 24. Background

North Sea fleets can be segmented into two parts: fleets with vessels that target species with catch quotas and fleets made out of vessels that target species with no catch quota (e.g., brown shrimp). Depending on this difference in fleet management, different effects might be expected e.g., on the success in achieving balanced fleets. For fisheries under quota management, imbalance may especially occur in mixed fisheries in a situation where it is difficult for fleets to align with the fishing opportunities for all stocks simultaneously. This becomes challenging as quotas are allocated to the MSs and not directly to the fleets, and quota swaps between Member States result from bilateral negotiations. One may think that allocating quotas to the fleets instead of to the MS might better correct for imbalanced situations in mixed fisheries whenever the fishing capacity of a fleet would target the resources that better fit this fleet instead of targeting the catch share this fleet has been allocated historically.

The greater North Sea contains ICES divisions 27.7.e, 27.7.d, 27.4.c, 27.4.b, 27.4.a and 27.3.a. The countries bordering this sea basin are from the EU, France, Belgium, the Netherlands, Germany, Denmark, Sweden and non-EU, the United Kingdom and Norway. There are many factors that currently contribute to the imbalance of the fleet in the North Sea. These factors can be grouped into environmental, economic, social, policy and geopolitical factors.

### 24.1. Overview of fleet capacity

Relating any results in relation to fleet capacity should start with an overview of the number of vessels per relevant segment for mixed demersal fisheries per country. In Table 51 an overview of the relevant fleet segments per country can be found.

**Table 51 – Relevant fleet segments form mixed demersal fisheries in the North Sea**

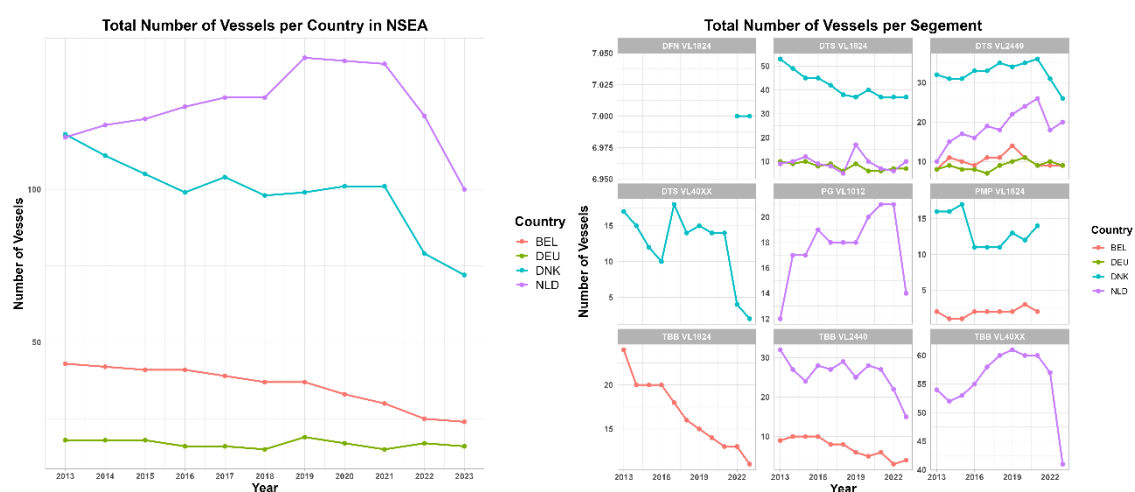
| Country         | Fishing technique | Vessel Length |
|-----------------|-------------------|---------------|
| Belgium         | DTS               | 24-40 metres* |
| Belgium         | TBB               | 18-24 metres* |
| Belgium         | TBB               | 24-40 metres  |
| Belgium         | PMP               | 18-24 metres* |
| Denmark         | DFN               | 18-24 metres  |
| Denmark         | DTS               | 18-24 metres  |
| Denmark         | DTS               | 24-40 metres  |
| Denmark         | DTS               | 40-xx metres  |
| Denmark         | PMP               | 18-24 metres  |
| Germany         | DTS               | 18-24 metres  |
| Germany         | DTS               | 24-40 metres  |
| The Netherlands | PG                | 10-12 metres  |
| The Netherlands | TBB               | 24-40 metres  |
| The Netherlands | TBB               | 40-xx metres  |
| The Netherlands | DTS               | 18-24 metres  |
| The Netherlands | DTS               | 24-40 metres  |

\* clustered fleet segments (includes more than one fleet segment due to GDPR safety of data). XX = vessel length above 40 metres. Source: Member state experts.

Considering the relevant fleet segments in the North Sea per country (Figure 36A), the number of vessels has remained stable at around 100 vessels for Denmark from 2016-2021 and rose to around 140 vessels for the Netherlands during the same time-period. A sharper decrease in the number of vessels can be observed between 2021 and 2023 for both MS. The Belgian vessels have declined over the entire time series of 2013 to 2023 going from almost 45 vessels in 2013 to about 20 vessels in 2023. The German vessels active in the NSEA have remained stable over the years at around 15 vessels.

For individual fleet segments (Figure 36B), larger changes in number of vessels have occurred over the years. Five fleet segments show a marked drop in number of vessels from 2021 or 2022 onwards especially related to Danish and Dutch fleet segments (vessels over 24 metres using DTS, PG and TBB). The number of vessels for the Belgian fleet segments show a steady decline except for the PMP segment that remained stable but was no longer reported on from 2022. This, because private data of less than three vessels cannot be securely reported on (STECF 23-14). For Denmark, a new fleet segment appeared in the North Sea from 2022 onwards (DFN VL1824).



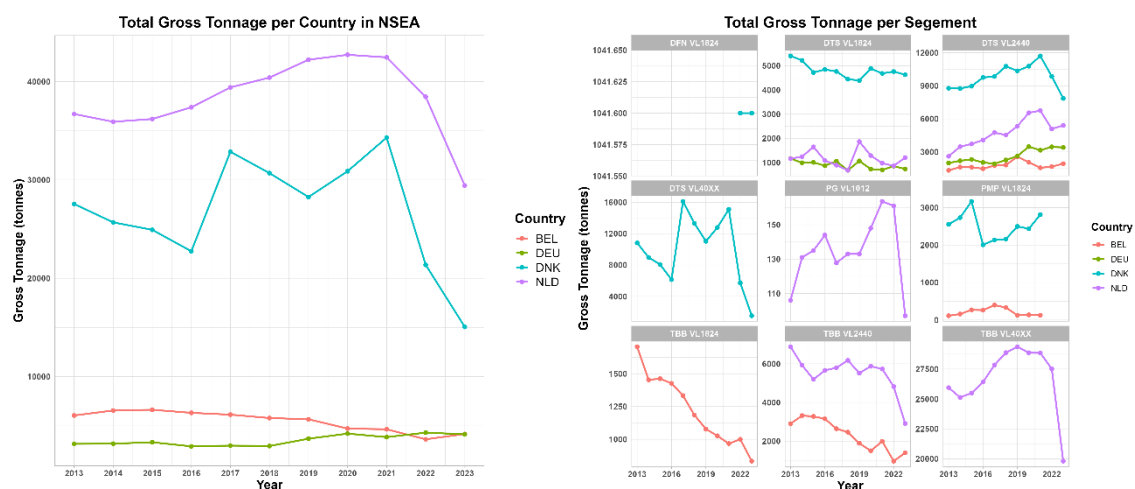
**Figure 36 – Number of vessels active in the North Sea involved in mixed demersal fisheries for 2013-2023**

Source: From STECF 23-14, public data annexed to report.

A. Total number of vessels active in the NSEA per country. B. Total number of vessels active in the NSEA per essential fleet segment for mixed demersal fisheries in the NSEA. Note the differences in the y-axis values.

Related to the number of vessels and important measures for capacity of the fishing fleet in any region are the gross tonnage (expressed as GT), or total weight of the vessels and the power (expressed in kW) of the vessels that operate in a sea basin.

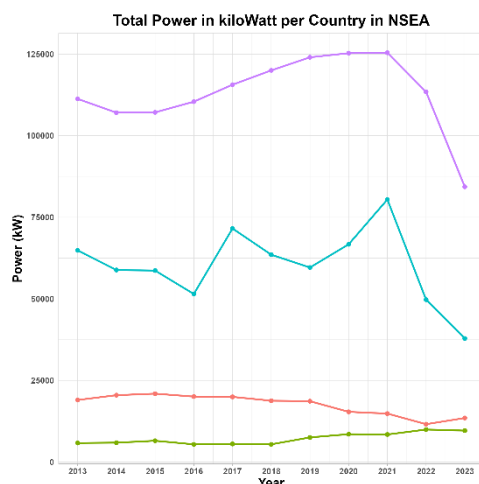
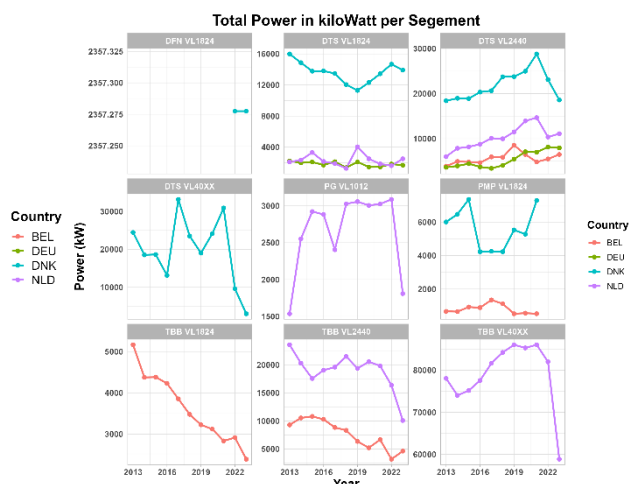
The GT of the vessels active in demersal mixed fisheries in the North Sea were markedly higher for the Netherlands compared to Denmark, Belgium and Germany (Figure 37A). From 2013 to 2021, GT varied over the years for Denmark and gradually increased for the Netherlands. In both countries GT reached a maximum in 2021 before strongly declining. GT values for the Belgian fleet only slightly decreased, while the GT values for Germany slightly increased. The variation in GT values for the Netherlands and Denmark can be explained by the yearly change of GT for all segments (Figure 37B), especially DTS VL2440, DTS VL40XX and PMP VL1824 for Denmark and all segments that are part of the Dutch fleet. All segments for both countries also show a marked drop in GT values from 2021 onwards, except DTS VL1824 for Denmark. The GT values for the Belgian fleet showed a general decrease over the time series especially for the TBB VL1824 segment. Although the GT values for the German DTS VL1824 decreased with a small amount, the values for the DTS VL2440 segment increased from 2013-2023 (Figure 37B).

**Figure 37 – Gross tonnage of vessels in the North Sea involved in mixed demersal fisheries for 2013-2023**

Source: From STECF 23-14, public data annexed to report.

A. Total weight in GT of vessels active in the NSEA per country. B. Total weight in GT of vessels active in the NSEA per essential fleet segment for mixed demersal fisheries in the NSEA. Note the differences in the y-axis values.

The total engine power (kW) of vessels active in the North Sea in mixed demersal fisheries shows a similar pattern to the GT values (Figure 38A). I.e. variable kW values for the Danish fleet, a rise and fall for the Dutch fleet, decreasing kW values for the Belgian fleet and increasing values for the German fleet. Similarly, the total power of the Dutch fleet was higher compared to the Danish, Belgian and German fleet (Figure 38A). The kW values per relevant fleet segments follows a near exact pattern to the GT values (Figure 38B) except for the Dutch PG VL1012 vessels in years 2018-2020, and lower kW values of Danish PMP VL1824 vessels in 2016-2017(Figure 38B). Reasons for such decoupling between kW and GT are unknown (this might link to engine renewal onboard the same vessels, new build with different engine, etc.).

**Figure 38 – Total power (kW) of vessels in the North Sea involved in mixed demersal fisheries for 2013-2023****A****B**

Source: From STECF 23-14, public data annexed to report.

A. Total engine power in kW of vessels active in the NSEA per country. B. Total engine power in kW of vessels active in the North Sea per essential fleet segment for mixed demersal fisheries in the North Sea. Note the differences in the y-axis values.

### 24.1.1. Capacity specific per country

#### 24.1.1.1. Belgium

In 2023, the capacity of the Belgian fleet decreased by 1 501 kW and 431 GT compared to the previous year, resulting in a total capacity of 43,190 kW and 13 422 GT. By the end of 2023, two fishing vessels were removed from the Belgian fleet through decommissioning under the Brexit Adjustment Fund (BAR), accounting for a cumulative reduction of 221 GT and 439 kW. Overall, the capacity of the Belgian fishing fleet has declined significantly, with a reduction of 37% in engine power (kW) and 45% in gross tonnage (GT) relative to the 2003 reference level. As a result, the current fishing capacity remains well below the national capacity ceiling.

#### 24.1.1.2. Denmark

The capacity of registered Danish fishing vessels for important segments in the mixed demersal fisheries in the North Sea—including inactive capacity—decreased between 2013-2023, both in terms of number of vessels, GT and kW. The reduction in capacity due to the impact of Brexit from 2020-2021 ended up being 4 173 GT and 11 899 kW via BAR.

#### 24.1.1.3. Germany

At the end of 2023, the entire German fishing fleet comprised 1 134 vessels, with a combined capacity of 56 230 GT and 125 113 kW of engine power. Compared to the previous year, the fleet size declined by 50 vessels, while total fishing

capacity increased slightly, rising by 111 kW in engine power and 1 938 GT in tonnage. Of the total fleet only an average of 15 vessels were active in mixed demersal fishing in the NSEA region, a number that remained stable over the time series. These 15 vessels represent a combined capacity of less than 3 000 GT and less than 4 000 kW of engine power.

#### 24.1.1.4. The Netherlands

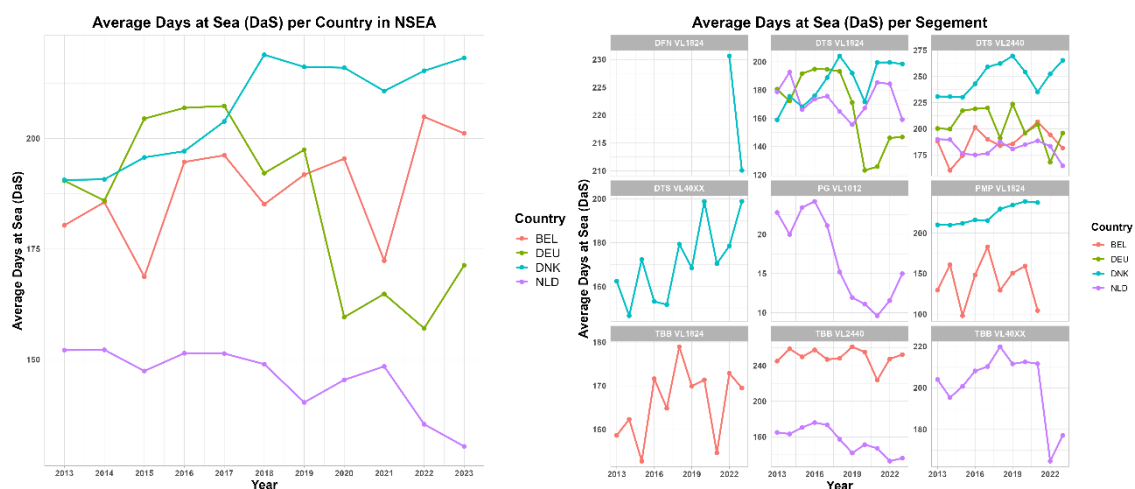
In 2023 the Netherlands fishing fleet contained 466 vessels, with in total 82 665 active GT and 190 570 active kW. By the end of 2023, the capacity of the Dutch fleet decreased sharply compared to 2022. This was mainly due to a large decommissioning scheme in the beam trawl fleet that came into effect in 2023-2024 which aimed to bring fleet capacity in line with post-Brexit quota (Hamon et al., 2023).

#### 24.1.2. Fleet activity across countries

Another aspect to introduce related to fleet capacity is the activity of the vessels involved in mixed demersal fisheries in the NSEA. The average days at sea (DaS) and a measure of activity in the form of the ratio between the average DaS and an empirically set maximum DaS of 220 are introduced here. A maximum of 220 DaS is used as per guidelines set forward by STECF (STECF 24-07).

An average DaS across fleet segments per country shows an initial increase of average DaS in the early years of the time series from 2013-2023 (Figure 39A). The average DaS peaked in 2018, 2017 and 2016 for Denmark, Germany and the Netherlands, respectively. The peak was followed by a general decrease of average DaS for each country. The average DaS for Germany decreased quite considerably, while to a lesser extent for Denmark, where DaS in 2023 recovered. The values of average DaS were lowest for the Dutch fleet. The average DaS values of the Belgian fleet remained variable throughout the time series (Figure 39A).

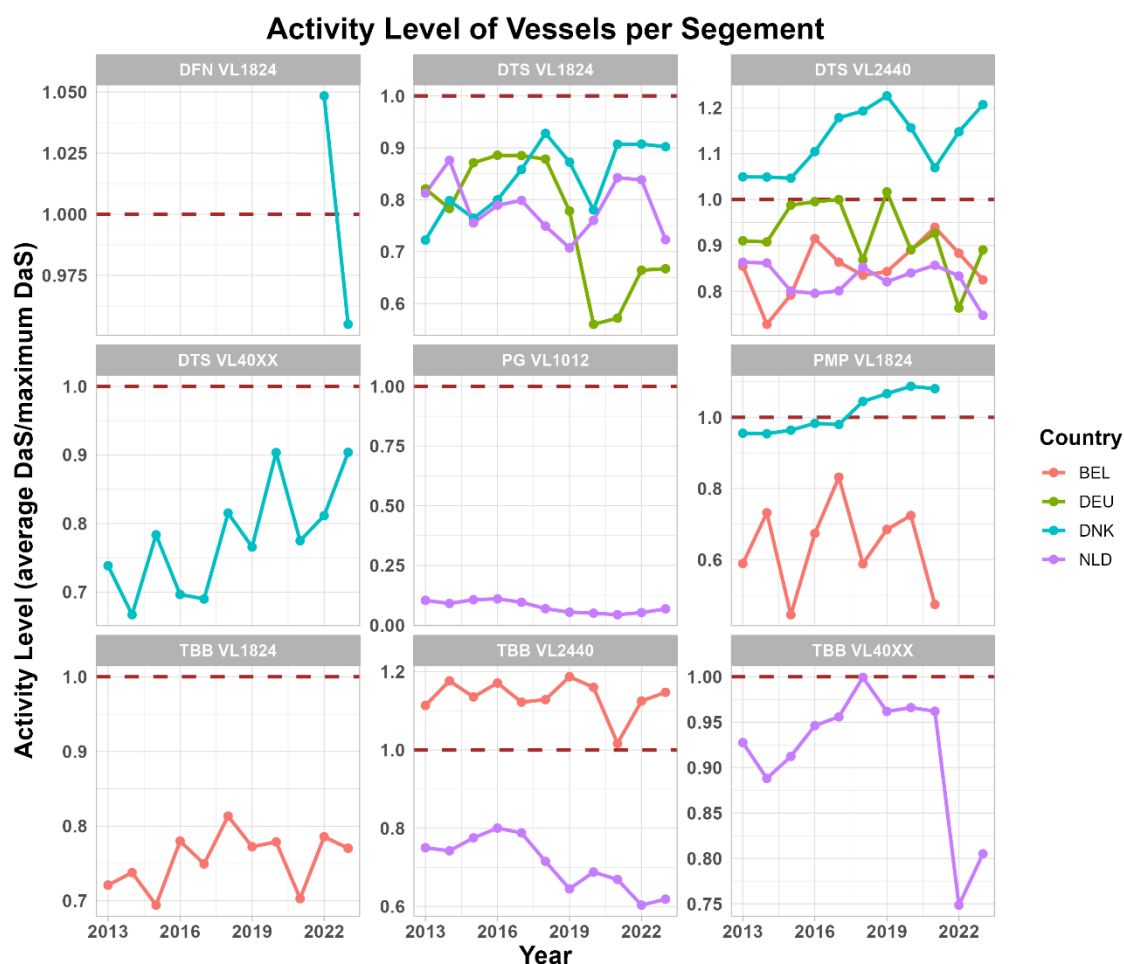
On a fleet segment level (Figure 39B), the average DaS showed an inverted “U-shaped” pattern (i.e., increase, peak, decrease) in the Danish DTS VL1824 and VL2440 segments, the German DTS VL1824 and all Dutch fleet segments from 2013-2021. After 2021 the average DaS is increasing again for most segments. In contrast, the Danish DTS VL40XX and PMP VL1824 segments showed an increase in average DaS. As the overall average DaS for the Belgian fleet suggests, all Belgian fleet segments showed variable average DaS values over the years.

**Figure 39– Average days at sea (DaS) of vessels in the North Sea involved in mixed demersal fisheries for 2013-2023**

Source: From STECF 23-14, public data annexed to report.

A. Average days at sea (DaS) of vessels active in the NSEA per country. B. Average days at sea (DaS) of vessels active in the NSEA per essential fleet segment for mixed demersal fisheries in the NSEA.

The activity level of the segments (ratio between average DaS/220 DaS (max DaS)), showed an above maximum activity (above dashed line) for the Danish DTS VL2440 and PMP VL1824 fleet segments and the Belgian TBB VL2440 fleet segment (Figure 40). Consequently, these fleet segments are active for more than 220 days per year. Note however, that DaS is not the same as fishing days and thus, that steam days (travel from and to port, to and from fishing areas) are included in DaS. All other fleet segments showed a ratio of less than one, being on average less than 220 days at sea. Noteworthy, is the low activity of the Dutch PG VL1012 fleet segment that have a very short fishing season and therefore spend only a short time of the year at sea (STECF 24-07).

**Figure 40 – Activity level of vessels in the North Sea involved in mixed demersal fisheries during the period 2013-2023**

Source: From STECF 23-14, public data annexed to report.

Activity level (ratio between average days as sea (DaS) and 220 DaS (max DaS)) of vessels in the North Sea per essential fleet segment for mixed demersal fisheries in the North Sea. Value of 'one' indicated by a dashed line equals the set maximum DaS of 220 days.

### 24.1.3. Fleet activity per country

#### 24.1.3.1. Belgium

No Belgian fleet segments are classified as imbalanced based on the criterion of more than 20% inactive vessels (based on VUR). This has consistently been the case over the past three years. The main Belgian fleet segments therefore appear to be broadly in balance with respect to the 'inactive fishing vessels' indicator (STECF-23-13).

#### 24.1.3.2. Denmark

For the most important Danish fleet segments participating in the North Sea mixed demersal fisheries, and also for the vessels responsible for the major part of the landings, the activity level is high and does not indicate underutilisation.

#### 24.1.3.3. Germany

For Germany, the activity level has declined from 1 to lower value for DTS segments since 2019.

#### 24.1.3.4. The Netherlands

The effort (DaS) of the Dutch fleet fluctuated over the years but generally decreased since 2014. Although the Dutch fleet shows less than 10% inactivity in terms of GT and engine power, the overall percentage of inactive vessels exceeds the 20% threshold (based on VUR). This is primarily due to the high number of small inactive vessels, comprising approximately 19% of the fleet, which together account for less than 1% of the fleet's total tonnage (STECF 23-13). Their inactivity can mainly be attributed to the fact that these fisheries are often seasonal and not full commercial operations. These semi-commercial vessels mainly employ passive gears and do not participate in the mixed demersal fishery covered in the case study.

#### 24.2. Aims and objectives

Multiple factors interact to impact fleet balance of which some factors may have compounding or even synergistic effects. For the North Sea case study, the impacts of key individual factors are mapped within each category. In addition, an overview is given of which impacts are linked and where possible synergies are at play.

An assessment was made to determine if data can be gathered for specific impacts on demersal fleet imbalance to show the magnitude of environmental, economic, social, policy, and geopolitical factors that affect fleet imbalance. In addition, regional comparisons were made to assess if a Member State spill-over effect to other MS is present or regional dynamics are important for demersal fleet imbalances in the North Sea. Such analyses in the case study will help to understand the recurrent and new factors, as well as their order of magnitude, if possible, that impact the imbalance of the demersal fleet in the North Sea.

### 25. Methodology

#### 25.1. General approach

Data were gathered for specific impacts on demersal fleet imbalance to show the magnitude of environmental, economic, social, policy, and geopolitical factors that affect fleet imbalance. Fleet capacity data for the relevant NSEA fleet was collected from the AER report (STECF 24-07) (see Section 1.1). Socio-economic data under the DCF, ICES CF, ICES advice, quota, quota swaps, landings, was consulted and analysed. Further data on quota, quota swaps and landings were gathered from MS specific sources, e.g. national public fisheries statistics, and MS experts as these sources are sometimes more accurate compared to overall EU-level or intergovernmental sources.

#### 25.2. Data and information sources



### 25.2.1. Information Sources

Generally, information on capacity, effort, socio-economic impacts and general impacts has been taken from relevant reports from STECF such as the Annual Economic Report (AER) and the Fleet Capacity Report. Further important sources consist of MS specific reports and public national fisheries statistics available from national Government databases (i.e., from Belgium, Denmark, Germany and The Netherlands), ICES reports, and the expert knowledge of the research team members. Relevant reports and documents are referenced in the text, under tables and figures and added into the reference list.

The sections below specifically describe particular workflows followed to extract data from relevant reports. These description entails how data was extracted and processed to make calculations and construct graphs.

### 25.2.2. General Capacity data

For general capacity descriptions of the fleet (Section 1.1), values of the following parameters were selected and extracted from the AER (STECF 23-14) data: total number of vessels, total gross tonnage (GT), total power (kW, average days at sea (DaS). A maximum number of days at sea was set at 220 days in order to calculate activity level where the average DaS was divided by the set maximum DaS. Data was extracted from North Sea specific data (including North Sea and Eastern Arctic) by setting filters for the following headers: country code, fishing technique, vessel length, variable code, and region name. The STECF North Sea data only accounts for the part of the fleet segment that is active in that region. This is valid for all gathered variables.

Note that the data on capacity entail the larger North Sea area including the Eastern Arctic waters. However, the fishing technique and vessel length filters were set specifically for fleet segments only active in the North Sea, of particular interest for mixed demersal fisheries, and for selected segments important for each Member State (see Table 51). Extracted data was loaded into R-studio (version 4.0.3) to process data, make calculations and make graphs. Trends from graphs were described in Section 1.1.

### 25.2.3. Quota, quota uptake and quota swap data

For Belgium, all relevant information on quota and quota swaps was collected from available data in reports produced by the Flemish government (De Belgische Zeevisserij 2013-2023 – Aanvoer en Besomming). Relevant data was extracted into an input Excel.

For Denmark, Germany and The Netherlands, the quota uptake was calculated using data from the government's annual reports; public national fisheries statistics available from national government databases; or data available on the

CIRCABC webpage of the European Commission <sup>(105)</sup>. Uptake was determined by dividing actual catch by the effective quota (both expressed in tonnes). The effective quota was calculated by taking the sum of the initial quota and any quota received or transferred through exchanges.

Information on quota and quota swaps was also collected from the CIRCABC page of the European Commission or from available data at public national fisheries statistics originating from national government databases. A specific workflow was developed to extract the relevant data from the quota and quota swap files. For each Member state the relevant species that are caught by the fleet segments contributing to the mixed demersal fishing in the North Sea were identified based on AER (STECF 23-14) catch data and expert knowledge. Relevant ICES subareas for the North Sea were identified and specified to include all North Sea relevant areas to filter the data. The quota and quota swap data for all Member States were selected for the considered time series using the relevant files from the CIRCABC webpage. An R-studio script was developed to filter the quota and quota swap data for each relevant species related to the relevant North Sea ICES catching areas.

Data on Member States' catch by species were extracted from the FAO catch list of the AER (STECF 24-07). Only catches of the relevant species and North Sea ICES areas were filtered.

For all Member States, the quota uptake was calculated using data from the government's annual reports or data available on the CIRCABC webpage. Uptake was determined by dividing the effective quota by the actual catch (both expressed in tonnes). The effective quota was calculated by taking the sum of the initial quota and any quota received or transferred through exchanges. Region-specific landings data from the AER (STECF 24-07) was used to calculate quota uptake. Data for the years 2021-2023 for Denmark, Germany and the Netherlands were provided by Member State experts.

#### 25.2.4. Socio-economic data

For socio-economic parameters, a similar approach as for general capacity descriptors was used. Values of the following socio-economic parameters were selected and extracted from the AER (STECF 24-07) data: Total number of jobs, total national full-time equivalent (FTE), operating subsidies, subsidies on investment, personnel costs, value of unpaid labour, energy cost, repair and maintenance costs, other variable costs, other non-variable costs, value of landings. These variables are directly provided by Member State via the Data Collection Framework program (Regulation (EU) 2017/1004). Several calculated parameters were extracted from the AER data:

---

<sup>(105)</sup> <https://webgate.ec.europa.eu/circabc-ewpp/d/d/workspace/SpacesStore/1bd22f3f-558e-4366-a062-956c3844a8ae/download>

- Gross value added
  - Landings income + Other Income – Energy costs – Repair and maintenance costs – Other variable costs – Non-variable costs
- Gross value added per FTE
  - (Landings income + Other Income – Energy costs – Repair and maintenance costs – Other variable costs – Non-variable costs) / full-time equivalent
- Net profit
  - (Income from landings + other income) – (crew costs + unpaid labour + energy costs + repair and maintenance costs + other variable costs + non variable costs+ depreciation- opportunity cost of capital)
- Revenue
  - Income from landings + other income

Data was extracted from North Sea specific data (includes North Sea and Eastern Arctic) by setting filters for the following headers: country code, fishing technique, vessel length, variable code, and region name (see Section 2.2.2). Note that the socio-economic data has the same limitations as the capacity data in relation to specific regionality.

### 25.3. Stakeholder consultation

An expert from every relevant Member State having mixed demersal fisheries in the North Sea was asked to provide relevant contact information of stakeholders in different roles related to fisheries. The group of consulted stakeholders consisted of representatives from governments (Federal, regional and local), research institutions, managing authorities, producer organisations and even end users of fisheries products.

The questionnaire was established based on relevant questions from experts, reviews by project lead and managers, task leaders, and case study leaders. Questions were further refined after feedback from DG-MARE. A concise set of questions was sent to each stakeholder including a few Member State-specific questions (questionnaire see Appendix 1).

A total of 20 questionnaires were sent out by mail, out of which three questionnaires were received fully filled in (

Table 52 ).

**Table 52 – List of key stakeholders approached for participation in the questionnaire**

| Country      | Institution                             | Relevance for the project                            | Response |
|--------------|-----------------------------------------|------------------------------------------------------|----------|
| BEL          | ILVO                                    | DCF National Correspondent                           | 0        |
| BEL          | Flemish Government                      | PO for the EU Commission                             | 1        |
| BEL          | Flemish Government                      | Policy advisor fisheries/PO                          | 0        |
| BEL          | Flemish Government                      | Direct adviser to viceminister-president (fisheries) | 0        |
| BEL          | Flemish Government                      | Vice head of cabinet minister of fisheries           | 0        |
| BEL          | Flemish Government                      | PO                                                   | 0        |
| BEL          | Flemish Government                      | PO                                                   | 0        |
| BEL          | VLIZ                                    | Specialist on fisheries (international relations)    | 0        |
| BEL          | ILVO                                    | Stock assessment specialist                          | 0        |
| BEL          | NGO                                     | Member                                               | 0        |
| BEL          | Provincial Government West-Flanders     | PO                                                   | 0        |
| BEL          | Local Council Nieuwpoort                | Alderman (fisheries)                                 | 0        |
| BEL          | Flemish Fish Auction                    | Managing director                                    | 0        |
| DEU          | Thünen Institute of Sea Fisheries       | Fisheries Researcher                                 | 1        |
| DNK          | Danish ministry                         | PO – Ministry                                        | 0        |
| DNK          | Danish Pelagic Producer organisation    | PO – Pelagics                                        | 0        |
| DNK          | Danmarks Fiskeriforening                | PO – Demersal                                        | 0        |
| DNK          | Danish Ministry of Food and Environment | PO – Small scale                                     | 1        |
| NLD          | Wageningen Marine Research              | Senior Fisheries Researcher                          | 0        |
| NLD          | Dutch Government                        | PO Fisheries                                         | 0        |
| <b>TOTAL</b> |                                         |                                                      | <b>3</b> |

## 26. Results

### 26.1. Balance Capacity indicators per MS

#### 26.1.1. Belgium

The 2023 Annual Fleet Report focuses on the following fleet segments in Belgium: DTS VL2440, PMP VL1824, TBB VL1824, and TBB VL2440.

The SAR indicator was equal to one for TBB VL2440, and equal to zero for the three other fleet segments in 2023. For the TBB VL2440 segment, the SAR was higher than zero for the past three consecutive years. However, the SAR (sole in 7a-a-2 and 7d-a-2) represent a small proportion of the segment's total landings. This SAR calculation is based solely on 2023 data and does not yet incorporate the revised benchmarks and advice introduced in 2024. As such, future assessments may yield different outcomes (Sys K., fleet balance expert, personal communication).

The RoFTA indicator shows mixed economic performance across fleet segments in 2022. Two segments - PMP VL1824 and TBB VL1824 - reported RoFTA values around 10% threshold, whereas DTS VL2440 and TBB VL2440 recorded negative RoFTA values. None of the fleet segments is flagged as economically imbalanced under a RoFTA-LTIR (low risk Long Term Interest Rate) indicator developed in Belgium, which requires values below zero for three consecutive years. This has consistently been the case for the past three years, indicating economic balance based on this indicator (Annual Fleet Report 2023 - Belgium).

The CR/BER indicator shows that the four Belgian fleet segments were economically viable in 2022. PMP VL1824 and TBB VL1824 showed healthy margins with CR/BER values of 1.07 and 1.44, respectively. Although DTS VL2440 and TBB VL2440 reported lower ratios (0.89 and 0.88), they were still above the critical level when assessed over the three-year period, which is the basis for identifying imbalance. As such, no fleet segments are considered in imbalance.

For the technical indicators in 2023, all Belgian fleet segments are considered in balance. The percentage of inactive vessels was well below 20% threshold for all length categories. Vessel utilization ratios (VUR) relative to both theoretical and observed maxima were also above 70% threshold for two of the segments, but lower than 70% for DTS VL2440 and PMP VL1824. However, both are very limited in number of vessels and the PMP segment consists of a heterogeneous group of vessels, which makes that the VUR indicator is not considered reliable for these segments. No fleet segments are flagged as imbalanced.

#### 26.1.2. Denmark

The 2023 Annual Report of fishing fleet capacity provides indicators pooled across fishing areas, i.e. are not specific to the North Sea demersal mixed fisheries. The following fleet categories in this report are important in the Danish

North Sea mixed demersal fisheries, DTS VL1824, DTS VL2440, DTS VL40XX and DFN VL1824 in 2023. In the reports of 2022 <sup>(106)</sup> and 2021 <sup>(107)</sup>, DFN VL1824 is not included. In 2023, none of the biological indicators indicated that any of these fleet segments in the North Sea demersal mixed fisheries were at risk. The biological SAR indicator equals one for DTS VL1824 and DTS VL2440, however, this relates to other stocks and fisheries in other areas, making the SAR indicator irrelevant for these segments. For 2022, both the DTS VL1824 and the DTSVL40XX had a SAR at one, and for 2021 all of the relevant fleet segments were flagged as imbalanced based on the SAR indicator.

The economic ROI indicator also flagged none of the fleets as out of balance in 2023, except for DTS VL2440 which was valued at -0.38. In 2022 and 2021, the DTS VL1824 was flagged as imbalanced. The economic indicator CR/BER showed a status of near imbalance for all of the relevant fleet segments, except for the segment DTS VL40XX. In 2022, only the DTS VL2440 was in balance, whereas in 2021 both the DTS VL40XX and the DTS VL2440 were in balance.

All of the technical indicators showed that the relevant fleet segments were in balance in 2023, except for the VUR for the DTS VL1824 fleet segment at a value of 0.65.

### 26.1.3. Germany

In the 2023 Fleet Capacity Report of Germany, a general analysis of the balance indicators of all segments was given (STECF 23-13).

In 2018-2022, the SHI-indicator for both German DTS segments was improving, and both segments were in balance. From 2009 until 2022, stocks that were identified as being at risk (SAR), were also being fished on a large scale, and revealed no consistent trend over time. The number of at-risk stocks reached a peak in 2019 with 23 cases, but has since declined across all segments, reaching one of the lowest levels in the time series by 2022, with 13 stocks classified as at risk.

The CR/BER indicator shows that mostly smaller vessels under 12 metres using primarily passive fishing gear frequently operate at a loss. However, it is important to consider that many of these vessels are not run as full-time commercial operations but rather serve recreational or supplementary purposes. As such, they follow different cost structures that are not directly related to the balance

<sup>(106)</sup> [https://fiskeristatistik.fiskeristyrelsen.dk/stat/flaaderapport/DK\\_Fleetreport\\_2022.pdf#:~:text=%20Annual%20Report%20on%20fishing%20fleet%20capacity,value%20in%202022%20on%20overall%20fisheries%20\(%25\)](https://fiskeristatistik.fiskeristyrelsen.dk/stat/flaaderapport/DK_Fleetreport_2022.pdf#:~:text=%20Annual%20Report%20on%20fishing%20fleet%20capacity,value%20in%202022%20on%20overall%20fisheries%20(%25))

<sup>(107)</sup> [https://oceans-and-fisheries.ec.europa.eu/document/download/af9ff2e4-3364-482c-91bc-2fecc9754a7d\\_en?filename=2021-fleet-capacity-report-denmark\\_en.pdf&prefLang=fr#:~:text=The%20report%20has%20been%20prepared,4041026%20%2D%2031/05/2022](https://oceans-and-fisheries.ec.europa.eu/document/download/af9ff2e4-3364-482c-91bc-2fecc9754a7d_en?filename=2021-fleet-capacity-report-denmark_en.pdf&prefLang=fr#:~:text=The%20report%20has%20been%20prepared,4041026%20%2D%2031/05/2022)



between fishing opportunities and fleet capacity. Additionally, these vessels contribute only marginally to total German catches, with their output constrained by technical limitations. A significant share of their landings consists of freshwater species, which are not subject to EU quota management. Consequently, the risk of quota-overfishing by this segment can be considered negligible.

From Germany's perspective, fishing capacity and fishing opportunities are well balanced in the key fleet segments responsible for the majority of catches.

#### 26.1.4. The Netherlands

In the 2023 Fleet Capacity Report of the Netherlands, three fleet segments were identified as being out of balance, based on the SAR indicator: PG-VL1012, TBB-VL2440 and TBB-VL40XX. This imbalance was mainly caused by perceived overfishing of North Sea sole, based on a previous stock assessment. For this stock, the assessment model showed a strong retrospective pattern and after a revision of the model, the stock is now assumed to be fished at levels below  $F_{MSY}$  after a strong decrease in fishing pressure in the years 2019-2024 (ICES, 2024; STECF 23-13).

The economic indicators for the Dutch fleet reveal a deteriorating situation, with three key metrics, ROI, RoFTA, and Gross Value Added GVA showing a marked downward trend over the past five years. The CR/BER indicator also appears to be declining over the years. Nevertheless, the figures for 2022 remain positive.

For the technical indicators in 2023, several Dutch fleet segments are considered out of balance, with a decreasing (improving) trend. Inactive vessels accounted for 27.2% of the total number of vessels, though only 3.9% of total GT and 7.5% of total kW. 6 segments were found to be out of balance for Vessel utilization ratios (VUR), with 5 segments in balance. The segments found to be out of balance in terms of the technical indicators are mainly small-scale, semi-commercial operations using passive gears. Of the vessels taking part in NS demersal mixed fisheries, TBB-VL1218 and TBB-VL1824 were found to be out of balance.

### 26.2. Quota and quota uptake per MS

#### 26.2.1. Belgium

In the Belgian demersal fisheries of the North Sea, several key target species have shown signs of full exploitation in recent years. Table 53 provides an overview of the national quota uptake between 2013 and 2023 for the key species (sole, plaice, ray (*spp.*), turbot, and cod) in Belgian fisheries.

Ray (*spp.*) and cod show consistently high uptake levels, with quota uptake exceeding 90% in most years, particularly from 2020 onward. This pattern suggests that these species have likely become increasingly restrictive for the fleet in recent years. Sole and plaice, two of the economically most important species for the Belgian fleet, display a contrasting trajectory. Uptake for both

species was relatively high in earlier years. However, since 2017, there has been a marked decline, with quota uptake for sole dropping below 55% in recent years and plaice even reaching as low as 10.1% in 2021.

**Table 53 – Quota uptake for economically important North Sea mixed demersal species for Belgium. Values are shown in percentage (%)**

| Species    | 2013  | 2014  | 2015  | 2016  | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|------------|-------|-------|-------|-------|------|------|------|------|------|------|------|
| Sole       | 52.8  | 93.4  | 93.9  | 77.5  | 53.6 | 44.8 | 47.0 | 39.8 | 34.3 | 42.6 | 52.3 |
| Plaice     | 89.4  | 92.0  | 71.5  | 80.1  | 69.8 | 69.8 | 57.8 | 43.1 | 10.1 | 29.3 | 34.7 |
| Ray (spp.) | 106.9 | 106.6 | 99.4  | 91.6  | 84.0 | 96.3 | 82.0 | 80.5 | 96.5 | 76.8 | 93.3 |
| Turbot     | 84.7  | 94.7  | 100.1 | 100.1 | 84.8 | 56.6 | 50.1 | 43.0 | NA   | 27.6 | 52.8 |
| Cod        | 99.6  | 99.2  | 99.7  | 88.8  | 71.8 | 50.8 | 60.5 | 86.0 | 92.0 | 90.9 | 92.2 |

Source: Calculation based on Government sources (De Belgische Zeevisserij 2013-2023 – Aanvoer en Besomming). Values >90%; >95%

## 26.2.2. Denmark

Table 54 shows the time series (2013-2023) of Danish national quota uptake for the most important species/stocks of the Danish North Sea mixed demersal fisheries. The quota for cod in the North Sea, saithe in the North Sea, anglerfish in the Norwegian Zone of the North Sea and hake in the Norwegian Zone have been restrictive (>90%). For those stocks the Danish relative share of the total international landings is not large, except for cod where it fluctuates between 15-20% on annual basis in the period 2013-2023 (Table 54).

Quotas have been restrictive especially for cod over the entire time series (2013-2023), and for hake and anglerfish in the earlier years (Table 54), but not in the recent years. Note that the percentages shown here are based on official landings and TACs (Table 54) and do not include discards. In the ICES advice sheets for those stocks only discard on international basis is reported.

**Table 54 – Quota uptake of economically important North Sea mixed demersal species for Denmark. Values are shown in percentage (%)**

| Species               | 2013 | 2014  | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022  | 2023 |
|-----------------------|------|-------|------|------|------|------|------|------|------|-------|------|
| Cod                   | 90.6 | 105.3 | 99.2 | 99.2 | 83.1 | 70.6 | 79.2 | 97.9 | 97.9 | 101.9 | 97.4 |
| Saithe (Pollock)      | 96.6 | 91.4  | 98.4 | 99.8 | 87.2 | 90.5 | 90.0 | 86.1 | 90.0 | 90.9  | 94.2 |
| Haddock               | 97.1 | 90.5  | 75.7 | 46.4 | 84.5 | 60.6 | 75.9 | 71.5 | 72.3 | 73.7  | 89.4 |
| Hake                  | 64.4 | 42.4  | 73.6 | 87.0 | 80.6 | 24.2 | 25.9 | 33.3 | 47.9 | 56.6  | 34.9 |
| Hake NW               | NA   | NA    | NA   | NA   | NA   | NA   | NA   | NA   | 97.1 | 97.9  | 96.4 |
| Whiting               | 7.9  | 15.2  | 31.7 | 28.8 | 25.1 | 12.2 | 47.9 | 27.1 | 21.5 | 19.7  | 13.8 |
| Plaice                | 79.9 | 60.2  | 55.2 | 61.3 | 46.8 | 40.8 | 31.3 | 28.1 | 25.1 | 20.0  | 19.3 |
| Sole                  | 71.9 | 89.9  | 96.8 | 88.8 | 64.4 | 54.1 | 19.8 | 17.0 | 21.2 | 13.1  | 11.5 |
| Anglerfish (Monkfish) | 25.9 | 42.1  | 88.1 | 90.1 | 98.5 | 67.7 | 54.3 | 30.0 | 66.6 | 48.4  | 79.2 |
| Anglerfish NW         | 73.8 | 73.5  | 90.0 | 94.2 | 93.6 | 91.5 | 94.3 | 75.7 | 97.8 | 97.3  | 92.7 |
| Nephrops              | 24.2 | 51.4  | 38.2 | 80.6 | 47.8 | 4.2  | 29.4 | 13.1 | 46.4 | 23.7  | 9.9  |

| Species     | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|-------------|------|------|------|------|------|------|------|------|------|------|------|
| Nephrops NW | 14.5 | 16.6 | 13.0 | 9.4  | 5.9  | 5.6  | 19.1 | 18.9 | 77.0 | 92.5 | 7.9  |

Source: Calculation based on Government sources (Danish Annual National Fishing Fleet Reports) and Danish national fisheries statistics: <https://fiskeristyrelsen.dk/fiskeristatistik/landingsstatistik-og-kvoteudnyttelse#c82836> and <https://lfst.dk/fiskeriet-i-tal/kvoter-og-kvoteudnyttelse> NW, Norwegian zone of NSEA. Values >90%; >95%

### 26.2.3. Germany

The quota uptake data comes from the database of the Federal Office for Agriculture and Food (BLE) which is responsible for collecting data on catches and landings. The quota uptake data for Cod shows a high uptake from 2013 to 2018 and a 0 uptake for 2019 and 2020 where probably quota exchange data with other Member State was not included. For herring the quota uptake was also very high between 2013 and 2020 and here also extra quota must have been obtained from other Member States. The quota uptake of sole and plaice show a clear decreasing trend between 2013 and 2020 as the number of vessels fishing on flatfish decreased substantially.

### 26.2.4. The Netherlands

For the Netherlands, reliable data on quota uptake was obtained from 2017-2023 (shown in Table 55). The percentages calculated for quota uptake for the Dutch North Sea fleet fishing mixed demersal species show high uptake for cod, herring and mackerel, which are economically important species for the Netherlands, as well as for anglerfish in recent years (Visserij in Cijfers, 2025). Uptake for sole and especially plaice were lower, especially in recent years.

**Table 55 – Quota uptake of economically important North Sea mixed demersal species for the Netherlands**

Values are shown in percentage (%)

| Species           | 2017 | 2018 | 2019 | 2020  | 2021  | 2022 | 2023 |
|-------------------|------|------|------|-------|-------|------|------|
| Cod               | 77.3 | 28.2 | 76.7 | 79.3  | 79.3  | 81.7 | 78.9 |
| Herring           | 99.8 | 93.4 | 97.2 | 100.2 | 102.3 | 99.5 | 97.2 |
| Atlantic mackerel | 96.2 | 94.9 | 92.6 | 91.3  | 90.6  | 93.6 | 88.9 |
| Plaice            | 50.2 | 44.0 | 43.3 | 41.0  | 37.8  | 29.4 | 21.2 |
| Sole              | 72.0 | 64.9 | 65.5 | 48.1  | 38.8  | 36.2 | 40.0 |
| Anglerfish        | 86.8 | 15.0 | 40.1 | 55.0  | 86.1  | 88.2 | 88.0 |

Source: Calculation based on EU source (CIRCABC) and on data provided by an expert. Values >90%; >95%

### 26.3. Quota swaps per MS

Information on quota swaps and exchanges differed between sources, for example national and government sources versus the CIRCABC webpage. In addition, the calculations with the collected data led to impossible results. The authors of this case study therefore decided not to show these results as to their questionable data quality. Some differences in data quality may result from non-complete data. For some Member State the CIRCABC webpage appears to only provide quota and exchanges within the Exclusive Economic Zone (EEZ) of the Member State. In addition, it remains unclear if both MS national and Government sources as well as the CIRCABC webpage show quota including or excluding discards. Are discards added or subtracted to quota before or after the exchange of quota also remains unclear. In addition to data quality issues, for the Netherlands and Denmark, the quota exchange exercise attempted here proved to be incredibly complex. Both national fleets possess either low active or inactive vessels that hold capacity and therefore might be used as leverage in quota allocation and quota exchange exercises. For Denmark, quotas are also allocated in regional quota pools which include many vessels that can exchange quota on individual vessel basis to fill capacity needs or to buffer against overcapacity (see e.g. pilot investigation for the Danish mixed demersal fishery in the North Sea in Appendix 2 showing how capacity use and profitability is optimized on vessel and fishery specific basis). The above findings show the difficulty of the quota exchange exercise and resulted in the more qualitatively described results presented here.

### 26.4. Mixed fishery and non-quota species

Due to the mixed nature of demersal fisheries in North Sea, differing stock status of fish caught together may lead to situations in which quota uptake of one species may be restricted because the quota of another species has already been fully taken (choke species). The ICES WG MIXFISH assesses the level of choke for these mixed fisheries using the single-species catch advice and information on the extent to which species are caught together. In 2024, they found that the main choke species in North Sea demersal fisheries were cod, which would restrict 23 out of 37 fleet segments fishing in the North Sea, followed by Norway lobster, which would constrain 14 of these fleet segments.

Avoiding catching cod above ICES advice values, would result in catching far below quota of all other species analysed, with a very large underutilisation of whiting, haddock, and plaice, and less so in brill, pollack, turbot and Norway lobster (ICES, 2025). Uptake of plaice (7.d) and sole (7.d) would not be affected as much. It is important to note that in recent years, quota and actual catches of North Sea cod have exceeded the catch advice.

For Norway lobster, the main constraining Functional Unit is Fladen Ground (FU32), which is exploited above the MSY target, and is the most limiting stock for 13 fleets. However, quota is not set at the FU level but rather at the level of

the entire North Sea, creating a mismatch between the biology of the stock and management.

In recent years, the fleets of several Member States, mainly The Netherlands, Belgium and Germany, have seen a large increase in landings of non-quota species, with long-finned squids and cuttlefish reaching the top 10 most landed species (personal communication MS experts). Other non-quota species such as striped red mullet and several gurnard species are also increasing in importance. This switch to species for which no quota system is in place implies that the fishery for 'traditional' quota species such as flatfish and gadoids have become less profitable. This has been attributed to both high fuel prices and restrictive quota. These new fisheries may have alleviated some overcapacity but concerns remain about the long-term sustainability of fisheries on these data-poor species. For example, fishing pressure on striped red mullet in the North Sea has been shown to be above precautionary values (ICES, 2023).

## 26.5. Socio-economic analyses important for capacity

### 26.5.1. General overview of the North Sea

In 2022, the North Sea fleet generated an estimated revenue of EUR 1 069 million, a decline of approximately 1% compared to 2021. Revenue is calculated as the sum of income from landings and other income. Due to an average increase in fish prices of 9%, the total value of landings in 2022 rose to EUR 1 035 million, 10% higher than in 2021. Nevertheless, this remained approximately 4% below the 2013–2021 average. While none of the Member States' fleets are entirely dependent on the North Sea for their fishing activities, the region remains highly significant in economic terms. Based on the value of landings in 2022, it accounted for 84% of total landings for the Netherlands, 83% for Denmark, 71% for Germany, 68% for Sweden, and 26% for Belgium (STECF 23-14).

In terms of value, the most important species in 2022 were Atlantic herring (EUR 139 million, +17% compared to 2021), common shrimp (EUR 135 million, +41%), Atlantic cod (EUR 95 million, +24%), Norway lobster (EUR 83 million, +15%), and common sole (EUR 75 million, -9%). Notably, the value of sand eel landings declined sharply by 30%, even though the landed weight decreased by only 2% (STECF 23-14).

For demersal fisheries the main target species in the North Sea include cod, Norway lobster, haddock, saithe, and hake. Denmark dominates the Norway lobster and cod fisheries by value and is also active in haddock and saithe fishery among EU Member States excluding UK and Norway, and the Norway lobster fishery is mainly in ICES Division 3a. Other countries such as France, Germany, the Netherlands, and Sweden participate to varying degrees, but with more limited economic importance. The Dutch and German fleets also focus on saithe and cod, while Belgium, Ireland, Lithuania, Poland, and Spain play minor roles,

targeting species like Norway lobster, European plaice, and Northern prawn (STECF 23-14).

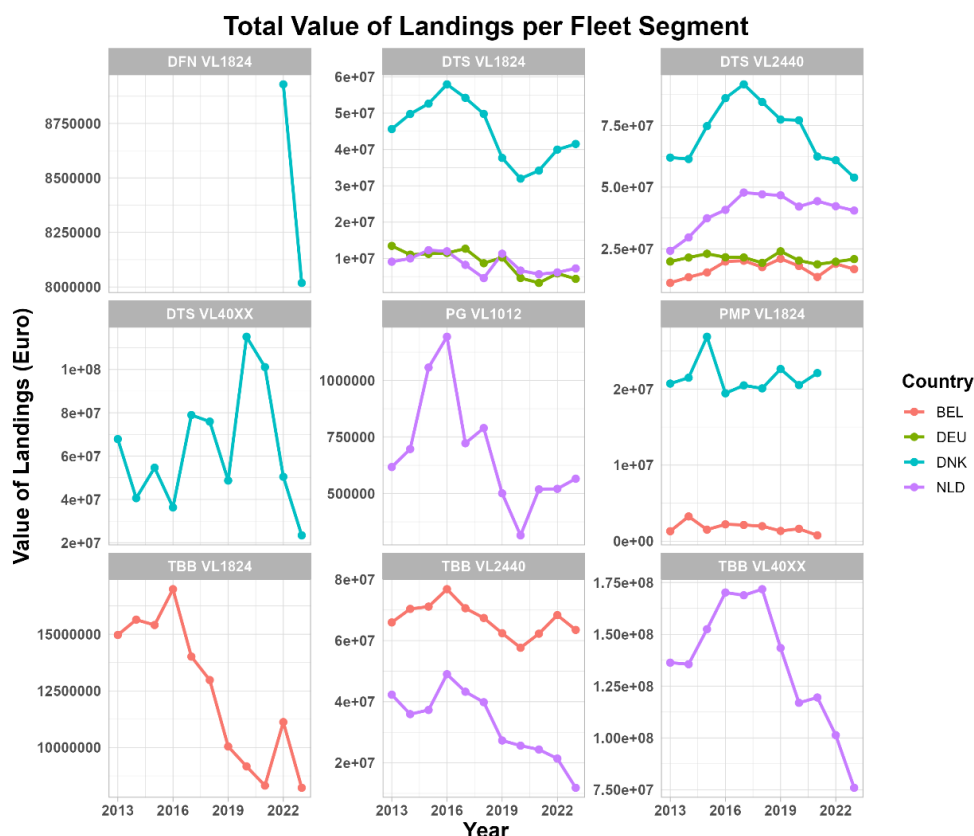
The primary Member States engaged in the flatfish fisheries (important economic species as they are often high value) in 2022 were the Netherlands, Denmark, Belgium, Germany, and France. Key target species included common sole and European plaice, with turbot and brill playing a smaller role. The Netherlands dominates the flatfish fishery, primarily targeting common sole with large beam trawlers in the southern North Sea. Denmark primarily uses otter trawls and other active gears to target flatfish in ICES Division 3a and Area 4. For the Belgian fleet, flatfish are the major economic species and are fished in the southern North Sea with beam trawlers gears that has recently been technically adapted to reduce environmental impact and fuel consumption and improve fishing selectivity (STECF 23-14). French vessels concentrate on sole and plaice in the Channel (ICES Division 7d), while the German flatfish fishery involves a small number of beam trawlers that operate similarly to the Dutch fleet (STECF 23-14).

## 26.5.2. Specific socio-economic parameters

### 26.5.2.1. Economic income: value of Landings

Total value of landings per Member State was briefly described in Section 3.4.1 and more detailed information can be found in the regional chapter of the North Sea as well as the national chapters of the STECF (23-14) AER report. Data on the level of segments of all Member States contributing to mixed demersal fisheries in the North Sea shows a general trend, with highest income from value of landing in 2015-2017 (Figure 41). Values of landings decreased after those peak years. The Danish DTS VL1824 managed to recover value of landings from 2019 onwards, and the Danish DTS VL40XX peaked in 2021 but shows a sharp decline ever since. The German and Belgian DTS VL2040 segments show a variable value landing, but rather stable when considering the entire time series (Figure 41). Similarly, the Belgian PMP VL1824 segments show only a slight decline in value of landings. Note however, that reporting on this segment stopped in 2021 due to data security issues (STECF 23-14).



**Figure 41 – Total value of landings per fleet segment involved in mixed demersal fisheries in the NSEA from 2013-2023**

Source: From STECF 23-14, public data annexed to report.

Note the differences in y-axis values.

#### 26.5.2.2. Economic costs: overview of costs

To provide results on costs of the Member State with fleet segments involved in mixed demersal fisheries in the North Sea, six cost parameters were filtered from STECF (23-14) data. These parameters were crew wage, energy cost, non-variable cost, repair and maintenance costs, estimated unpaid labour cost and variable costs. Interpreting the actual cost values is rather difficult without large amounts of context, thus some trends are described here.

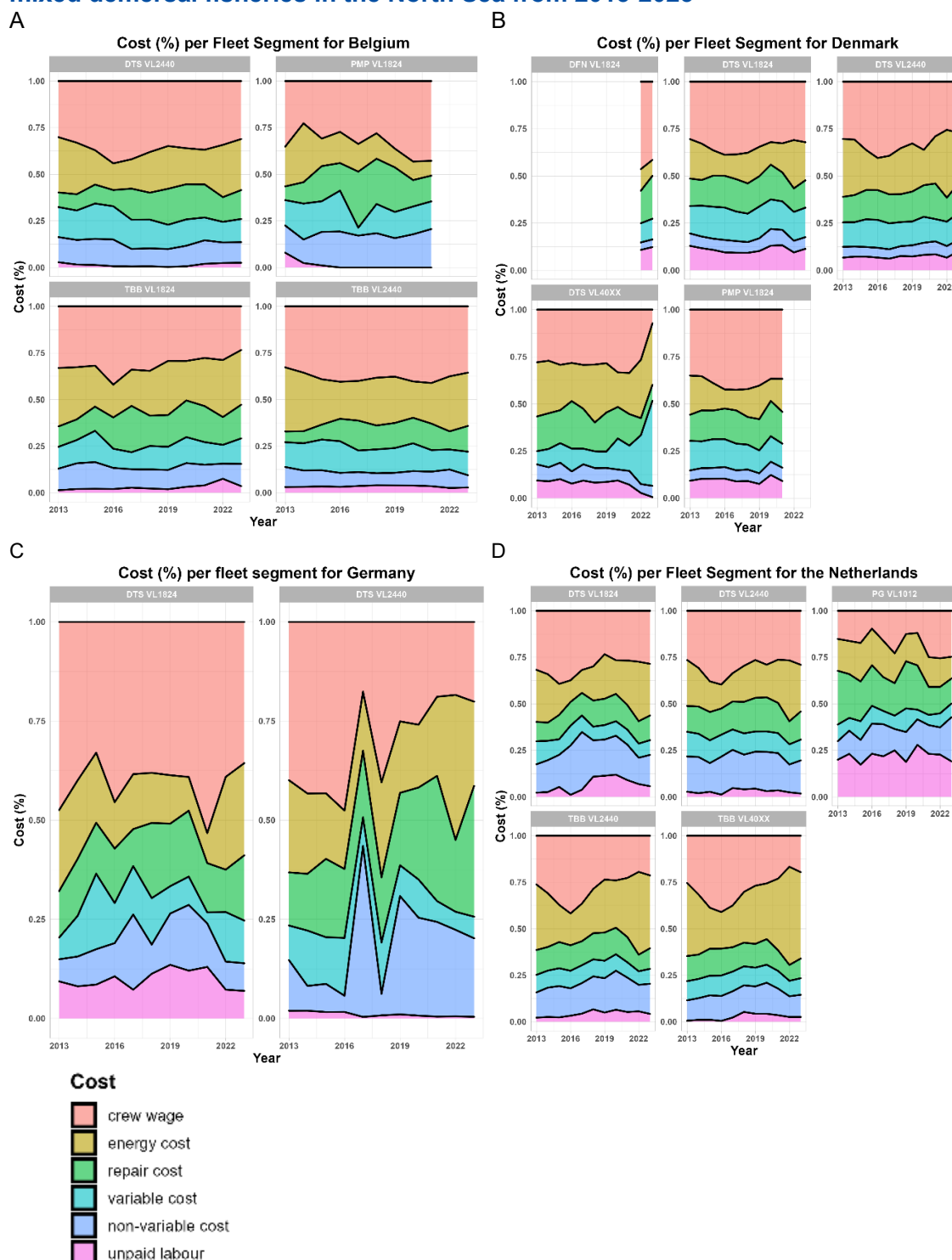
Across Member states and segments the crew wage is the highest cost. Interesting exceptions are the Danish DTS VL40XX where crew wage costs trends increased up to 2020 and sharply decreased from 2020 onwards, the Danish PMP VL1824 which shows rather stable crew costs across the time series, and the Dutch PG VL1012 segment where crew costs are variable and do not follow a general trend. The latter segment is also interesting as the crew wage is not the highest cost but rather the estimated unpaid labour (Figure 42).

Across the Member state fuel prices dominate cost structures as energy cost is most of the time the second largest cost to operating vessels. Especially, because traditional fleet segments using active gears for demersal fishing are energy intensive. The energy cost peaks in 2022 where marine diesel fuel prices were at an all-time high (+73% in 2022 compared to 2021). For the Belgian TBB VL1824,



The Danish DTS VL2040, the German DTS VL2440 and the Dutch TBB VL2440 and VL40XX, the fuel price was the highest cost (Figure 42). After 2022, fuel prices normalised again closer to initial values.

**Figure 42 – Proportion of each cost per MS and per fleet segment involved in mixed demersal fisheries in the North Sea from 2013-2023**

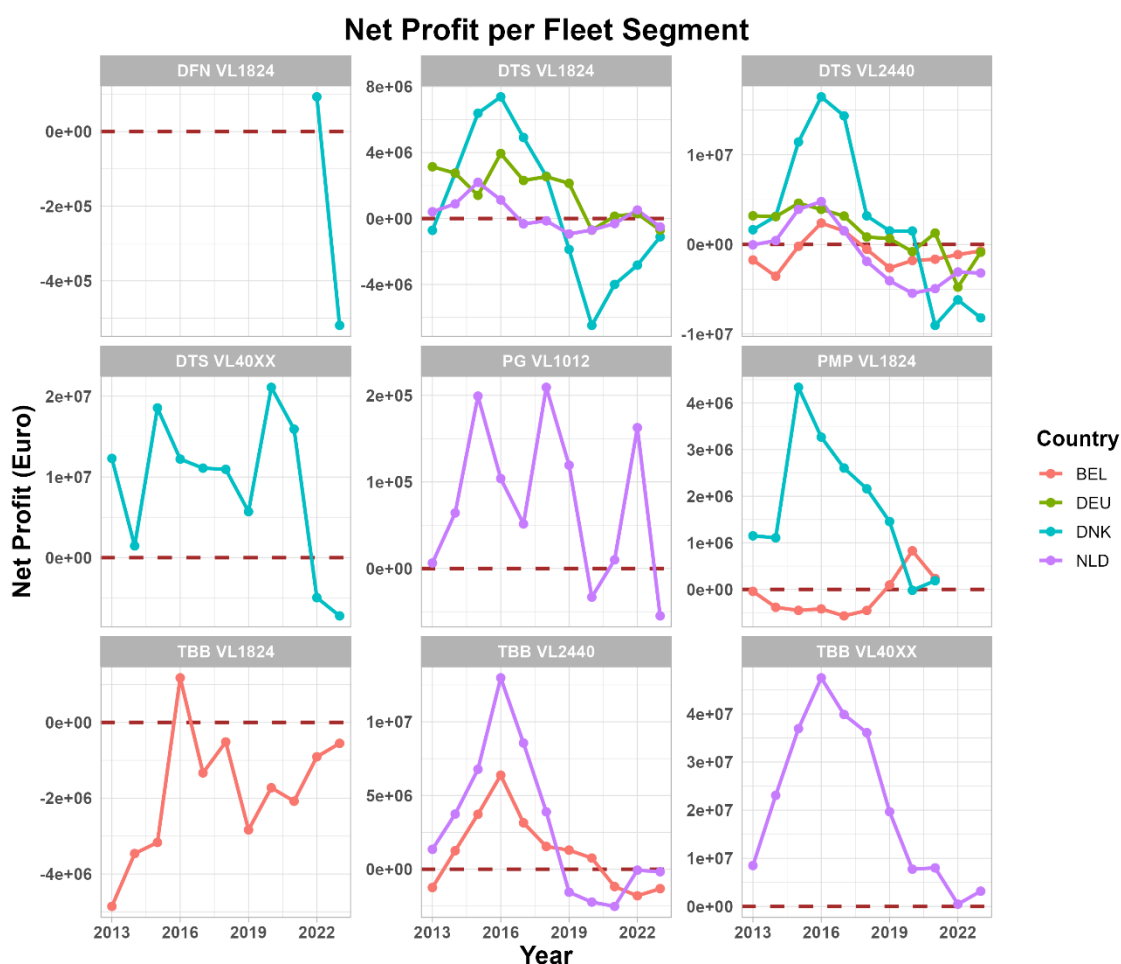


**Source:** From STECF 23-14, public data annexed to report. A, Belgium; B, Denmark; C, Germany; D, the Netherlands. Every cost factor was divided by the sum of all cost factors per MS, per segment, per year. A proportional percentage of each cost factor per year is shown with the sum of costs per year being 100%. Note that the y-axis is expressed in decimal percentage.

### 26.5.2.3. Economic profitability

An important economic indicator that determines the profitability of an operation is the net profit. Figure 43 The zero value, i.e. the value at which income and costs are in balance or break even is key (Figure 43). For all Danish segments, except TM VL2440, net profit was positive in early years of the time series and turned negative in most recent years. A similar observation can be made from the data of the German fleet segments involved in mixed demersal fishing in the North Sea. For Belgium, only in the peak value of landings years (2015-2017) positive net profit was reached. All other years of the time series, the Belgian fleet segments operated at a loss (Figure 43). The Dutch fleet segments with PG VL1012, TBB VL2440 and VL40XX operating mostly on positive net profits.

**Figure 43 – Net profit per fleet segment involved in mixed demersal fisheries in the North Sea from 2013-2023**



Source: From STECF 23-14, public data annexed to report.

Note the differences in y-axis values. The zero value is indicated with a red dashed line and equals break even or zero profit. Values above the red line represent positive profit, values under the red line represent negative profit, i.e. an economic loss.

### 26.5.3. Description of general socio-economic outlook

For 2024, projections suggest a further increase in landed weight, 3% compared to 2022 and 6% compared to 2023. Economic performance is expected to improve across key indicators, with GVA rising by 16% compared to 2022 and 12% compared to 2023, gross profit by 12% and 18%, and net profit by 56% and 53%, respectively. These gains bring performance levels close to their average over the last ten years. The gradual decline in vessel numbers and employment is expected to continue. An economically stronger performing fleet or fleet segments within their fishing opportunities, means a better balance in the long term, if fleets or fleet segments have the finances to improve sustainable harvest on all levels, i.e. developing sustainable and innovative gear, investing in 'greener' ship technology, and more. An economically robust fleet within their fishing opportunities is important for long term balance stability.

The AER (STECF 23-14) overall assessment for 2024 anticipated that the first half of 2024 would be characterized by high inflation rates, a significant real increase in ex-vessel prices, and stable conditions compared to 2023, though still much lower than in 2022. Consequently, economic recovery was expected, with overall values nearing those of 2021 and substantially improved compared to 2022. However, STECF (in report 23-07) cautioned that the reliability of any projection depends heavily on market stability, something that is ascribed to the forecasting model that is used in generating predictions for one or two future years. Since 2020, markets have been highly unstable due to factors linked to geopolitical events, complicating forecasts. Another point of caution related to forecasting the economic outlook of the fishing fleet is that fuel price data is only available through to May during the AER reporting period in July. For successful forecasting projected fuel costs are extrapolated for the remainder of the year. If market conditions shift, for example like in the second half of 2022, the forecast models ran during the AER reporting period may overestimate costs, as was the case in the AER 2024 model. On the contrary, as fish prices currently remain high, but may decrease due to market instability and reduced purchasing power, income and profits may also be overestimated.

### 26.6. Special issue: impact of the UK withdrawal from EU on fleet capacity

Following the United Kingdom's exit from the EU in 2021 ("Brexit"), the EU–UK Trade and Cooperation Agreement (TCA) outlines how both parties allocate their respective fishing rights in each other's waters. Under this agreement, 25% of the EU's fishing rights in UK waters had to be gradually reallocated to the UK fleet between 2021 and 2025. The UK waters are especially important for the French and Irish fleets, with the Irish fleet being most affected, 98% of its effort occurs in the Atlantic North Western Waters (NWW) area, of which the UK waters make up a significant part. The transfer of EU quota value to the UK occurred in phases, with 60% transferred in 2021, 70% by 2022, 92% by 2023, and full implementation (100%) expected by 2024. A renegotiation of quota shares was foreseen for 2025. These negotiations were positive with continued agreements until 2038 (with continued 25% of the EU's fishing rights in UK waters reallocated

to the UK fleet) and access of fleets to UK waters, thus improving the fishing opportunity of MS fishing in UK waters (Decision No 1/2025).

Irrespective of positive renegotiations and increased access to UK waters, Brexit has reshaped EU–UK fisheries relations. Formerly EU-managed fish stocks in the North Sea are now considered shared, requiring joint management. EU vessels must now obtain licenses from UK authorities to access UK waters. The reduction in quota value has affected several EU Member States, most notably for the pelagic fleets of France and Ireland, but also for the Netherlands, Denmark, Germany, Spain, and Belgium, with more limited effects on Sweden, Poland, Portugal, Estonia, Lithuania, and Latvia. The effects of the TCA became visible in 2022, with total landed weight in the region falling by 10%, especially for pelagic species.

#### 26.6.1. Brexit: Belgium

Brexit directly impacted the Belgian fishing sector through the loss of access to UK fishing areas and the complete halt of landings in the UK during 2021 and 2022 (STECF 24-07). Ongoing uncertainty about how to manage UK landings continues to create operational difficulties. These changes may have contributed to a reduced attractiveness of the fishing profession, with potential long-term risks such as vessel owners ceasing operations and a resulting loss of skilled personnel; especially the latter consequence may be difficult to reverse.

#### 26.6.2. Brexit: Denmark

The Danish Annual Report on Fishing Fleet Capacity of 2023 (ARFFC 2023), reported a reduction in capacity from 2020-2021 ended up being 4,173 GT and 11,899 kW via the Brexit Adjustment Reserve (BAR). The Brexit decommissioning scheme favoured vessels with the highest fishing activity, i.e. most days at sea, as well as vessels that chose to sell their quotas to the Danish Fisheries Agency of four species of special importance for coastal fisheries (cod, sole, saithe and turbot). These are important stocks for the Danish North Sea mixed demersal commercial fisheries, and for which the quotas are reduced by the Trade and Cooperation Agreement (TCA) between the EU and the UK. The Danish Fisheries Agency allocated the quotas to coastal fishers in order to create an opportunity for this segment to improve their economic outlook and eventually strengthen this segment. The aim was to achieve a better balance between fishing opportunities and capacity by removing vessels with high activity. By the 31st of December 2023, 28 vessels were decommissioned in accordance with the scheme under the BAR reducing Danish capacity in the North Sea demersal mixed fisheries significantly due to Brexit.

### 26.6.3. Brexit: Germany

The AER 2024 (STECF 24-07) only briefly mentions the effects of the Brexit in Germany. The impact on the German fleet can primarily be observed through quota reductions and complications in renewing international fisheries agreements. Due to renewed positive agreements for access in UK water, the German point of view is that the effects of Brexit are no longer impacting the German fleet.

### 26.6.4. Brexit: the Netherlands

The Dutch fishing fleet experienced negative economic effects due to the Brexit (STECF 24-07), prompting around 30 vessel owners to cease operations in 2022 in anticipation of BAR that came into effect in 2023. The situation related to future fishing opportunities was uncertain as much depended on renegotiation in 2025 about access to UK waters. However, due to positive renegotiations in 2025 this outlook has improved considerably as continued access to UK waters has been granted and agreements were reached running until 2038.

## 26.7. Questionnaire results

### 26.7.1. Belgium

Belgian respondents emphasized that the fleet segments have consistently remained in balance over the past decade, based on the overall evaluation of multiple indicators and long-term trends. The stakeholder's perspective on the demersal fishery, specifically beam trawling for flatfish, is that a stability has been shown over time for the Belgian fleet.

Respondents pointed out that positive or negative shifts in SHI are often the result of changes in biological evaluation for sole stocks, as this species is the main target species in many fishing areas. Issues arise when changes occur in scientific biological reference points or methodological updates that can affect the balance evaluation. There are also concerns about the reliability of using binary indicators (in balance/out of balance) for nuanced policy making, especially in cases where the evaluation affect only a few target or non-target species. The economic performance indicator is also seen as strongly influenced by external factors such as fluctuations in fuel and fish prices. The instability in global markets, due to energy crises, Brexit, COVID-19, or geopolitical conflicts, shape the economic context in which the fleet operates.

Respondents noted that Belgium aimed at good fisheries management so that to ensure good resource status, prioritizing long-term resource sustainability. Rather than pursuing structural fleet reductions, respondents considered that Belgium has chosen to concentrate its limited resources on fostering a modern, resilient fleet where adaptation, research and innovation are key.

Respondents believe that the Fleet policy in Belgium has remained stable in recent years, with a long-standing focus on capacity reduction already embedded

in its structural approach. Only a small-scale cessation scheme involving three vessels was enacted at the end of 2023, following the consequences of Brexit. The country continues to employ its fish-catch coefficient system, allowing fishers to exchange engine power (kW), either subsidised or not, for increased fishing rights (retaining fishing rights, improving fishing rights or building a reserve of fishing rights, not more than 25% of official catch license) (Aanvoer en Besomming, 2024). Looking ahead, respondents noted that the key challenges are less about reducing capacity and more about aligning with evolving standards in safety, energy transition, and the broader blue economy.

The respondents were cautious about the role of permanent cessation programs, characterizing them as financially intensive measures that should be used only in clear-cut cases of overcapacity.

Fleet inactivity is reportedly minimal in Belgium. The policy context encourages active vessel participation, supported by a collective quota system. The main drivers of inactivity are non-structural factors such as retirement or aging vessels.

In terms of improving the implementation of fleet balance indicators, respondents expressed some scepticism about current balanced fleet reports. They feel these reports are high-level tools that condense complex fisheries dynamics into a simplified indicator set, often overlooking important contextual drivers. Factors such as interannual quota stability, strong fish stocks, favourable market conditions, investments in infrastructure, and the entry of young fishers into the sector likely drive the fleet balance. However, respondents believe that these elements are not easily captured within the current indicator framework.

Regarding the management of capacity ceilings, Belgium has already reduced its fishing capacity by approximately 40% over the past two decades. However, it is believed that there is no link to the in-balance/out-of-balance of fleets in Belgium.

#### 26.7.2. Denmark

The responses to the questionnaire aimed at participants in Denmark were from different points of view, either representing the pelagic fleet or the small-scale coastal fleet.

In the pelagic sector owning quotas and vessels fishing also demersal fish stocks in the North Sea, reported changes in the balance status of fleets over the past five years are primarily driven by technological and environmental considerations. New vessel designs incorporate sheltered fish/water separation decks, which are included in capacity calculations, thereby requiring more capacity. Additionally, the sector is transitioning away from heavy fuel-driven engines toward alternative, low-emission propulsion systems, a shift that the respondents consider necessitating larger vessel sizes to accommodate new technologies. These developments influence balance assessments under current regulatory frameworks.



Denmark maintains a capacity register and allows vessel owners to swap or purchase capacity, which offers a degree of flexibility in maintaining formal balance across the fleet. However, respondents from the pelagic sector indicate the use of this mechanism is rather limited; the management of pelagic and demersal stocks through TACs appears to reduce the sector's reliance on capacity-based interventions. In terms of fleet inactivity, the respondents note that the pelagic fleet fishing both demersal and pelagic species and holding quotas for these suffers primarily from a lack of quota and low economic incentives to target certain stocks.

Respondents of small-scale fisheries (SSCF) stated that calculations and methods used by the STECF, and national authorities are not representative for SSCF. The respondents believe that the indicators are based on calculations more appropriate for large industrial vessels and fail to reflect the operational realities of small-scale fishing, thus making it hard to comment on potential balance changes. However, some existing challenges are acknowledged. One of the main concerns appears to be the decreasing availability of fishing opportunities in coastal waters, forcing small-scale vessels to travel farther offshore, reducing the number of viable fishing days due to weather limitations. Furthermore, competition with larger industrial vessels, particularly Dutch beam trawlers, causes different challenges, as they may damage passive fishing gear and affect local ecosystems due to the usage of heavy bottom-trawling gears. These developments significantly undermine the economic and ecological sustainability of SSCF operations. The Danish administration has attempted to mediate the conflicts with beam trawlers, but these efforts have not yet yielded any substantial outcomes.

Following Brexit, a permanent cessation program aimed at reducing fishing capacity in the North Sea fleet and was not necessarily considered successful by the respondents. Some fishers who received financial compensation have either resumed fishing or relocated to other regions, thereby limiting the overall effectiveness of the measure. Respondents of the SSCF noted that most North Sea fisheries are not necessarily limited by quota constraints, making capacity reduction an ineffective tool for addressing specific challenges to the SSCF.

SSCF respondents proposed several targeted solutions to support the SSCF, such as allocating dedicated quotas, establishing trawl-free zones, engaging in fish predator species management, or improving scientific knowledge of coastal stocks vital to small-scale fishers.

With respect to managing the overall capacity ceiling, it was noted that Denmark has not approached the ceiling for either kW or GT and therefore does not actively manage fleet capacity at the national level. There are limits on how long a fisher can retain inactive GT before it is returned to the common pool, but this remains a largely symbolic measure. According to the respondents, fleet capacity indicators are generally not used in active management, aside from their occasional role in informing permanent cessation programs.



### 26.7.3. Germany

The German respondents identified several key drivers behind recent shifts in the balance status of their fishing fleets. A primary factor has been climate change, which might have caused measurable shifts in both the distribution and biomass of target species. Added to this ecological disruption was the sharp increase in fuel prices, a direct consequence of the Russian invasion of Ukraine. Respondents believe that such a significant financial pressure on the sector lead to underinvestment in the fleet and a lack of innovations.

With respect to the current fleet balance status, the respondents attributed the situation to several interrelated causes. The EU ban on pulse trawling had a direct effect on fleet viability. The loss of quota following Brexit further constrained fishing opportunities. In addition, although the EU's proposal to prohibit bottom trawling in protected areas was eventually dismissed, it created lingering uncertainty in the sector. The COVID-19 pandemic also delivered a disruptive shock to the seafood value chain, affecting logistics and market demand in the wake of an already difficult fishing year. The respondents noted that together, these events weakened the economic stability of the fleet and contributed to structural imbalances.

To maintain fleet balance, respondents reported that Germany has implemented a range of management decisions. Centrally stands the capacity regulation scheme, which is partially funded through revenues generated from offshore wind farm area auctions, as well by the Brexit Adjustment Reserve (BAR). Respondents consider that quota swapping remains a vital strategy, particularly for accessing *Nephrops*, a high-value species in Germany. These swaps, typically conducted with the UK in exchange for cod quota, are still happening post-Brexit but have become more complex and uncertain.

The respondents noted that permanent cessation programs can be effective tools for restoring fleet balance under specific conditions. Their utility depends on the presence of genuine overcapacity or situations in which existing capacity cannot be economically deployed. However, they underscore some downsides as well. One example is that capacity levels could reduce too much, to levels that impair the fleet's ability to fully exploit quotas in the future, especially if stocks recover or more fuel-efficient vessels become available. Alternative methods are proposed, such as supporting the diversification of fleet portfolios and shifting fishing effort toward less-exploited resources. This could be supported by including public funding for campaigns or initiatives that encourage the use of underutilised or non-quota-managed species.

Fleet inactivity in Germany is primarily attributed to the high cost of fuel. Even in instances where quota access is sufficient and market prices are favourable, the cost of fuel renders fishing operations economically unsustainable at the current level of fuel usage.

Looking ahead, the respondents suggested that fleet segmentation should be improved. An analysis comparing the standard balance indicators under the DCF segmentation to new, fishery-based segmentation revealed that existing classifications masked specific imbalances, particularly in mixed demersal fisheries. Enhancing segmentation methodologies could thus bring previously “hidden” out-of-balance fleet segments to light.

With regard to the capacity ceilings established, the respondents noted that overall capacity is jointly managed by Germany's federal government and coastal states. Currently, the German fleet operates below these capacity ceilings, and not all available capacity is being used. In this context, the respondents note that the challenges facing the demersal fleet are not attributable to overcapacity.

Finally, respondents acknowledged that the fleet capacity indicators are used in a procedural sense. When a fleet segment is assessed as out of balance, a formal action plan is developed, typically involving efforts to reduce capacity. An example of this can be recognised in the case of the Baltic trawl fleet, where the collapse of key target stocks triggered a dramatic reduction in capacity.

#### 26.7.4. The Netherlands

No answers were received from Dutch experts that were invited to take part in the questionnaire.

### 27. Discussion

#### 27.1. Fishing capacity

Fishing capacity must be balanced with fishing opportunities to obtain a sustainable exploitation and socio-economically viable fishing fleet. The results show that fleets of the Member State that have segments that contribute to mixed demersal fisheries in the North Sea have been decreasing in number of vessels, weight (GT) and engine power (kW) from 2013-2023. In recent years, fleet capacity has decreased more significantly for Denmark and the Netherlands. One of the reasons behind the recent reduction in fleet capacity was the Brexit Adjustment Reserve (BAR) that was used for a decommissioning scheme and therefore, removed vessels, GT and kW from the fleets. Indeed, for the Netherlands a large-scale cessation in 2022-2023 had the most impact on overcapacity, read out of balance fleet segments. The cessation was necessary to rebalance the fleet segments due to combined effects of high fuel prices, restrictive quota (i.e. cod for the Netherlands), consequences of Brexit and loss of fishing area (Hamon et al., 2023).

A limitation of the current case study is that it mainly looks at general capacity of fleet segments involved in mixed demersal fisheries of the North Sea while the reporting of capacity sometimes pools capacity across several other regions and fisheries. If Member States have clear guidelines on how to calculate capacity related balance indicators, because of this, Member States sometimes have their own interpretation or strategies on how to calculate those indicators and also how

to manage and divide capacity among fleet segments. In managing the capacity, Member States have also their own specific system where vessel owners can 'buy and sell' a form of virtual capacity from a national reserve, i.e. capacity that is not actual part of the physical GT and kW of the vessel. There are also systems where vessels owners can 'buy and sell' or 'share' virtual capacity on local levels.

Hence, the national reports on capacity can sometimes report different methods of sharing and managing capacity, reflecting different positions the Member State take towards over- or undercapacity, i.e. imbalance. For example, contrary to the STECF assessment, each Belgian capacity report of the current time series states that the fleet of the Member State is in balance with fishing opportunity, that enough effort is undertaken to reduce and manage capacity under the ceiling and that no immediate extra efforts are necessary (Belgian Annual Fleet Report 2018-2023). A similar position is taken by Denmark and Germany (Danish Annual National Fishing Fleet Reports) <sup>(108)</sup> which contradicts the STECF evaluation which follows the EC guidelines.

Stakeholder consultation in the North Sea shows that quota shortage, especially of choke species, environmental changes, such as shifts in location of stocks, and economic changes such as cost of fuel, are the mentioned possible drivers for explaining imbalance of fleets and fleet segments involved in the demersal mixed fisheries. All stakeholders recognise that current balance indicators related to capacity, as followed by STECF, are valuable and useful. However, all stakeholders perceive these indicators only as high level and useful in specific situations, for example where there is a clear-cut case of overcapacity. The stakeholders infer that a clear-cut case of overcapacity depends on more than the indicators presented in the STECF balance capacity reports. In line with this clear-cut case of when context specific cases are present, permanent cessation programs can be useful to help rebalance a fleet or fleet segment. Yet, based on stakeholder consultation, it becomes clear that every Member State has different points of view on fleet balance and that every Member State has therefore different approaches to managing and rebalancing the fleet or fleet segment. For Belgium, a structural reduction of capacity is part of their long-term management, while for Denmark and the Netherlands, permanent cessation programs are used. All stakeholders remark on cessation as a consequence of Brexit, indicating that the UK leaving the EU and its consequences for fishing fleets was an important driver for changes in balance of fleets in recent years.

Interestingly, stakeholders noted on different drivers for the future rebalancing of fleets via redistribution of capacity throughout the fleet or fleet segments. For Belgium realigning the fleet with new standards, such as safety, energy transition and broader blue economy. One of the Danish stakeholders pointed towards less, but larger vessels with innovative engine technology on board, and that this may redistribute capacity within the fleet. The German stakeholder cautioned for too

---

<sup>(108)</sup> <https://fst.dk/Media/638693399235473740/DK%20Fleet%20report%202023.pdf>

low capacity due to cessation schemes but suggested that diversification of the fishers' portfolio, indicating that larger flexibility in fishing techniques for quota and non-quota species may help alleviated negative balance changes of the fleet or fleet segments.

## 27.2. TACs and quota uptake, and quota swaps

The quality and completeness of a stock assessment is essential for correct and comprehensive fleet management, indicator calculations and determination of quota. This is the essential step for deciding on right levels of fishing opportunities that align with biological requirements and that would ideally balance with the existing fishing capacity of the fleet. Evaluating the quota uptake a posteriori gives one of the indications for measuring how well capacity was used or if there have been situations of over- or under-utilisation of this capacity.

In the case of the capacity exceeding the fishing opportunities there is likely a need for exchanging/swapping some of those opportunities between fleets in needs. The accurate data that was collected on quota of important species for mixed demersal fishing in the North Sea, showed that exchanges happened but the relative amounts generally were low and in the range of 5-10%. Quota swaps are to meet actual fisheries in their areas so that fleet and fleet segments can fish to the most effective result. Non-restrictive quotas appeared to be used for swapping and could have helped to keep the capacity of the fleet in balance, thus fulfilling their role. However, the low amount of swapped quotas is not a sign for the absence of needs for a redistribution but rather an indication that quota swapping possibilities were likely underused as situations of over- or undercapacity remained.

The data across the time series showed that uptake (i.e. actual landings) of important mixed demersal species has been decreasing over the years and is almost always lower compared to the effective quota in recent years. These results indicate that no overcapacity or imbalance is present in the fleet or fleet segments, in case when fleet-segments in balance would only be defined as being able to catch the quota allocated to them. However, the STECF report on balance indicators (24-13) shows for some of these fleet segments out of balance values. The indicators defined by the EC 2014 guidelines capture broader effects than quota uptake alone (i.e. SAR, SHI, and economic indicators).

The observed persistent low quota uptake likely resulted from mechanisms related to subtle quota dynamics and technical interactions that may drive fleet or fleet segment imbalance whenever choke species or sensitive marine species would limit the fisheries. Some species have low quota because of their health or environmental status in relation to stock sustainability. These species, such as cod, are caught during mixed demersal fishing, even though they are not the main target species and their quota are quickly filled. Once the quota of a choke species is filled, the fishing on other species with less restrictive quota also often must stop. Such a restrictive quota can create imbalance, even if quota swapping is allowed. Moreover, cod may not be subject to quota swapping as cod is an

economically interesting and important species. Some solutions to the above-mentioned quota dynamics that may help to balance fleet capacity is switching to non-quota species (see Section 3.4) and as stakeholders suggested, diversify with alternative fishing techniques to catch the quota of less restrictive species.

### 27.3. Socio-economic analyses and indicators

Fishing capacity is linked to vessel characteristics, fishing techniques, species the vessels can catch and limited by the available quota and thus linked to fleet and fleet segment balance which also account for socio-economic indicators.

An important aspect that impacts the economics of fishing segments is the cost structure. Raising costs may impede a well-functioning fishing segment. Also, other factors that influence the economy of the vessel, such as the age of the vessels, age of the component of the vessels, depreciation rates, fishing technique and economic earning models of vessels linked to their specific fishing operation may impact capacity. Thus, even within a fleet segment as now defined under the Common Fisheries Policy (CFP) and DCF, economic models within a specific segment may sometime be far from uniform. The Regional Coordination Group on Economic Issues (RCG-ECON) made efforts towards an alternative segmentation of the fleets, where economic models of vessels included in the segment and thus also cost structure are better matched. Such alternative segmentation may provide more accurate economic analyses (RCG-ECON: ISSG novel approach to the segmentation of fishing fleets <sup>(109)</sup>).

If costs are high, with crew wages and energy costs being the highest (see Section 3.5.2.2), profitability might turn low. Although some businesses can carry high costs and most for a short time, continued high costs may increase the risk for fleet imbalance.

### 27.4. Environmental impacts driving imbalance

The stakeholders remarked that environmental changes have an increasing impact on fisheries and may have an increasing impact on fleet segment capacity in coming years. Environmental changes affected the physical dynamics of the marine environment and changed water temperatures, salinity, oxygenation, turbidity, etc. in the North Sea (Huthnance et al., 2016). Stakeholders questioned the relevance of adapting the fleet capacity to such changes linked to factors “external to fishing”. However, environmental changes can have impact over multiple years, and thus, the adaptation of fleet capacity alongside those changes is unavoidable to preserve future fishing opportunities in a changing ocean productivity.

### 27.5. Technical and methodological challenges

---

<sup>(109)</sup>

[https://datacollection.jrc.ec.europa.eu/documents/d/dcf/2023\\_workshop\\_issg\\_segmentation\\_ws](https://datacollection.jrc.ec.europa.eu/documents/d/dcf/2023_workshop_issg_segmentation_ws)

A challenge pertaining quota, quota swap and quota uptake data was that multiple sources such as MS government sources and the EU CIRCABC webpage had non-overlapping different information, where the researchers expected overlapping information that could be cross-referenced with each other. This created uncertainty about the data validity and quality, leading to a quantitative description in Section 3.3, rather than showing data in graphs. Moreover, the data on the CIRCABC webpage and of MS government sources were not transparent in including or excluding amounts of discarded fish. Meanwhile, Denmark employs a system where vessel owners can share quota in a local and regional pool system (ARFFC, 2023; Appendix 1), a local level of quota exchange that has not been fully investigated here across countries, fisheries and vessels. This made any analyses on quota, quota swaps and quota uptake very difficult because different segregation and dis-aggregation levels of functional units and fleet components are needed before defining homogeneous units in order to conduct fishing capacity evaluation.

Specific methodological issues related to balance indicators underlines that oversimplification of the more diverse realities of the EU fleets might occur. Perhaps integrating more of dynamic biological, operational and socioeconomic contexts and factors would improve the relevance of these indicators greatly.

## 28. Conclusions and recommendations

Fleet capacity across Belgium, Denmark, Germany, and the Netherlands has generally declined over the past decade, driven by structural reforms, Brexit-related quota reallocations, and rising energy costs. While these capacity reductions have helped address overcapacity in some segments, they also raise concerns about underutilisation and long-term viability.

Quota dynamics, particularly the role of choke species like cod and Norway lobster, emerge as critical drivers of imbalance. These species under declining productivities, often caught incidentally in mixed fisheries, can prematurely halt fishing activities for other more abundant stocks, undermining fleet efficiency. Although quota swaps offer some flexibility, their limited application so far may have restricted their potential for rebalancing capacity.

Socio-economic indicators underscore the fragility of fleet profitability. High crew wages and energy costs dominate expenditure profiles, with net profits fluctuating across segments and years. The economic health of fleets is not solely tied to quota availability but also to broader market conditions, vessel age, and operational models. Stakeholders emphasize that current fleet segmentation under EU frameworks often fails to capture these nuances, calling for more tailored, context-sensitive approaches.

Environmental changes, such as shifting stock distributions, ocean productivity and climate-driven ecosystem variability, add further complexity. If some stakeholders fail to see that the fishing capacity will need to adapt to those changes, other stakeholders advocate for adaptive management strategies, which can include ecosystem-based fisheries management (as in development



by ICES) and diversified fishing portfolios, to enhance resilience of the demersal fishing fleet sector in the North Sea.

Methodological challenges persist. Data fragmentation, inconsistent reporting standards, and aggregated balance indicators hinder comprehensive analysis. Stakeholders stress the need for more integrated, multidimensional frameworks that reflect the realities of mixed fisheries and support informed policy decisions.

#### Stakeholders' suggestions:

- Revise fleet balance indicator framework for greater nuance
  - Current EU segmentation and balance indicators may aggregate different fleet realities.
  - Introduce multi-dimensional metrics that complement on biological, operational, and socio-economic contexts.
  - Support alternative segmentation models (e.g. RCG-ECON) that would better reflect economic diversity within fleet segments.
- Address choke species through adaptive quota management
  - Cod and Norway lobster currently constrain mixed demersal fisheries.
  - Develop more flexible quota allocation systems, including functional unit-level management and dynamic quota swaps.
  - Explore mechanisms to mitigate capacity underutilisation caused by choke species, such as selective gear innovation and spatial management.
  - Use data resolutions to assess balance relative to fishing capacity by quantifying the share of each segment engaged in sustainable fishing (i.e., aligned with available fishing opportunities), accounting for opportunities for national-level quota swaps between individual vessels within regional quota pools to optimize capacity use and profitability.
- Support fleet resilience through diversification and innovation
  - Encourage diversification alternative fishing techniques balanced with quota species and regular fishing techniques
  - Invest in low-emission propulsion systems and energy-efficient gear to reduce fuel dependency.



- Use cessation schemes strategically, not systematically
  - Large-scale decommissioning could be reserved for clear cases of structural overcapacity.
  - Prioritize targeted, context-sensitive interventions that align with long-term fleet modernisation goals.
  - Ensure cessation programs would not undermine future capacity to exploit recovering stocks or adapt to new opportunities
- Improve data transparency and integration across sources

Harmonize quota, quota swap, and catch data between national reports and EU platforms like CIRCABC clarify treatment of discards.

- Clarify local quota pooling mechanisms (e.g. Denmark's harbour pools).
- Develop centralized, validated databases to support cross-country comparisons and policy decisions.

## 29. References

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL Guidelines for the analysis of the balance between fishing capacity and fishing opportunities according to Art 22 of Regulation (EU) No 1380/2013 of the European Parliament and the Council on the Common Fisheries Policy

Decision No 1/2025 of the Specialised Committee on Fisheries established by Article 8(1)(q) of the Trade and Cooperation Agreement between the European Union and the European Atomic Energy Community, of the one part, and the United Kingdom of Great Britain and Northern Ireland, of the other part of 19 June 2025 as regards the arrangements on the level and conditions of access granted by each Party to vessels of the other Party to fish in its waters from 1 July 2026 to 30 June 2038 [2025/1231]

Devogel, G., Velghe, M., Van Liefferinge, J. (2015). De Belgische zeevisserij 2015: Aanvoer en besomming: Vloot, quota, vangsten, visserijmethoden en activiteit. De Belgische zeevisserij: aanvoer en besomming. Departement Landbouw en Visserij: Brussel. 117 pp.

Devogel, G., Velghe, M., Van Liefferinge, J. (2016). De Belgische zeevisserij 2016: Aanvoer en besomming: Vloot, quota, vangsten, visserijmethoden en activiteit. De Belgische zeevisserij: aanvoer en besomming. Departement Landbouw en Visserij: Brussel. 117 pp.

Hamon, K., G., Hoekstra, F. F., Klok, A., Kraan, M., van der Veer, S., Deetman, B., van Oostenbrugge, J. A. E., & Taal, K. (2023). Decommissioning of the Dutch cutter sector: Impact analysis of management measures on the fishery. (Report / Wageningen Economic Research; No. 2023-068). Wageningen Economic Research. <https://doi.org/10.18174/631351>

Huthnance, J., Weisse, R., Wahl, T., Thomas, H., Pietrzak, J., Souza, A., Heteren, S., Schmelzer, N., van Beusekom, J., Colijn, F., Haigh, I., Hjøllø, S., Holfort, J., Kent, E., Kühn, W., Loewe, P., Lorkowski, I., Mork, K., Pätsch, J., Woodworth, P. (2016). Recent Change—North Sea. In: Quante, M., Colijn, F. (eds) North Sea Region

- Climate Change Assessment. Regional Climate Studies. Springer, Cham. [https://doi.org/10.1007/978-3-319-39745-0\\_3](https://doi.org/10.1007/978-3-319-39745-0_3)
- ICES (2023). Striped red mullet (*Mullus surmuletus*) in Subarea 4 and divisions 7.d and 3.a (North Sea, eastern English Channel, Skagerrak and Kattegat). ICES Advice: Recurrent Advice. Report. <https://doi.org/10.17895/ices.advice.21840957.v1>
- ICES (2024). Benchmark workshop on selected flatfish stocks (WKBFLATFISH). ICES Scientific Reports. Report. <https://doi.org/10.17895/ices.pub.25471987.v1>
- ICES (2025). Working Group on Mixed Fisheries Advice (WGMIXFISH-ADVICE; outputs from 2024 meeting). ICES Scientific Reports. 7:1. 255 pp. <https://doi.org/10.17895/ices.pub.28182638>
- Lenoir, H., Aers, F., Blanco, C., Blondeel, L., Depestele, J., Desmidt, J., Hostens, K., Peccue, E., Polet, H., Van Hoey, G., Van Opstal, M., Vanderperen, E., Verlé, K., 2023. Belgian Sea Fisheries - Background information on the sustainability pathway in the last decade. ILVO MEDEDELING D/2023/11. ISSN 1784-3197.
- Maertens, B. (2018). Annual Fleet Report 2018 – Belgium: Sustainable balance between fishing capacity and fishing opportunities. Department of Agriculture and Fisheries: Brussel. 25 pp.
- Maertens, B. (2020). Annual Fleet Report 2020 – Belgium: Sustainable balance between fishing capacity and fishing opportunities. Department of Agriculture and Fisheries: Brussel. 27 pp.
- Maertens, B. (2021). Annual Fleet Report 2021 – Belgium: Sustainable balance between fishing capacity and fishing opportunities. Department of Agriculture and Fisheries: Brussel. 28 pp.
- Maertens, B. (2022). Annual Fleet Report 2022 – Belgium: Sustainable balance between fishing capacity and fishing opportunities. Department of Agriculture and Fisheries: Brussel. 25 pp.
- Maertens, B. (2023). Annual Fleet Report 2023 – Belgium: Sustainable balance between fishing capacity and fishing opportunities. Department of Agriculture and Fisheries: Brussel. 30 pp.
- Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy, amending Council Regulations (EC) No 1954/2003 and (EC) No 1224/2009 and repealing Council Regulations (EC) No 2371/2002 and (EC) No 639/2004 and Council Decision 2004/585/EC
- Regulation (EU) 2017/1004 of the European Parliament and of the Council of 17 May 2017 on the establishment of a Union framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the common fisheries policy and repealing Council Regulation (EC) No 199/2008 (recast)
- Scherrens, N., Blancquaert, P., Van Guyze, D., Maene, I., De Clercq, P. (2020). De Belgische zeevisserij 2020: Aanvoer en besomming: Vloot, quota, vangsten, visserijmethoden en activiteit. De Belgische zeevisserij: aanvoer en besomming. Departement Landbouw en Visserij: Brussel. 117 pp.
- Scherrens, N., Rau, N., Blancquaert, P., Van Guyze, D., De Clercq, P. (2021). De Belgische zeevisserij 2021: Aanvoer en besomming: Vloot, quota, vangsten, visserijmethoden en activiteit. De Belgische zeevisserij: aanvoer en besomming. Departement Landbouw en Visserij: Brussel. 117 pp.
- Scherrens, N., Blancquaert, P., Van Guyze, D., Rau, N., De Clercq, P. (2022). De Belgische zeevisserij 2022: Aanvoer en besomming: Vloot, quota, vangsten, visserijmethoden en activiteit. De Belgische zeevisserij: aanvoer en besomming. Departement Landbouw en Visserij: Brussel. 117 pp.

- Scherrens, N., Blancquaert, P., Van Guyze, D., Rau, N., De Clercq, P. (2023). De Belgische zeevisserij 2023: Aanvoer en besomming: Vloot, quota, vangsten, visserijmethoden en activiteit. De Belgische zeevisserij: aanvoer en besomming. Departement Landbouw en Visserij: Brussel. 89 pp.
- Scherrens, N., Rau, N., Van Guyze, D., Vancoppenolle, A., De Clercq, P. (2024). De Belgische zeevisserij 2024: Aanvoer en besomming: Vloot, quota, vangsten, visserijmethoden en activiteit. De Belgische zeevisserij: aanvoer en besomming. Departement Landbouw en Visserij: Brussel. 87 pp.
- Scientific, Technical and Economic Committee for Fisheries (STECF) - The 2024 Annual Economic Report on the EU Fishing Fleet (STECF 24-03 and 24-07), Prelezo, R., Sabatella, E.C., Virtanen, J., Tardy Martorell, M. and Guillen, J. editor(s), Publications Office of the European Union, Luxembourg, 2024, doi:10.2760/5037826, JRC139642.
- Scientific, Technical and Economic Committee for Fisheries (STECF) - Assessment of balance indicators for key fleet segments and review of national reports on Member States efforts to achieve balance between fleet capacity and fishing opportunities (STECF-24-13), Casey, J., Gras, M. and Virtanen, J. (editors), Publications Office of the European Union, Luxembourg, 2025, <https://data.europa.eu/doi/10.2760/0565930>, JRC140753.
- Tessens, E., Velghe, M., Van Liefferinge, J. (2013). De Belgische zeevisserij 2013: Aanvoer en besomming: Vloot, quota, vangsten, visserijmethoden en activiteit. De Belgische zeevisserij: aanvoer en besomming. Departement Landbouw en Visserij: Brussel. 117 pp.
- Tessens, E., Velghe, M., Van Liefferinge, J. (2014). De Belgische zeevisserij 2014: Aanvoer en besomming: Vloot, quota, vangsten, visserijmethoden en activiteit. De Belgische zeevisserij: aanvoer en besomming. Departement Landbouw en Visserij: Brussel. 117 pp.
- Velghe, M., Scherrens, N., Welvaert, M., De Clercq, P. (2017). De Belgische zeevisserij 2017: Aanvoer en besomming: Vloot, quota, vangsten, visserijmethoden en activiteit. De Belgische zeevisserij: aanvoer en besomming. Departement Landbouw en Visserij: Brussel. 117 pp.
- Velghe, M., Scherrens, N., Van Guyse, D., Blancquaert, P., De Clercq, P. (2018). De Belgische zeevisserij 2018: Aanvoer en besomming: Vloot, quota, vangsten, visserijmethoden en activiteit. De Belgische zeevisserij: aanvoer en besomming. Departement Landbouw en Visserij: Brussel. 117 pp.
- Velghe, M., Scherrens, N., De Temmerman, P.-J., Blancquaert, P., Van Guyse, D., Vanhulle, K., De Clercq, P. (2019). De Belgische zeevisserij 2019: Aanvoer en besomming: Vloot, quota, vangsten, visserijmethoden en activiteit. De Belgische zeevisserij: aanvoer en besomming. Departement Landbouw en Visserij: Brussel. 117 pp.
- Visserij in Cijfers. 2025. Wageningen Social and Economic Research. <https://agrimatie.nl/visserij/visserij-in-cijfers-2025/>. Visited 2-8-2025.

## Appendix 1: Stakeholder questionnaire

### Case Study 5: North Sea Mixed Fishery

1. What are the **main drivers** behind reported changes in fleets **in balance** or **out of balance** over the **past 5 years**?
2. What are the **causes** of the **current** fleets **in balance** or **out of balance** situation (e.g. resources status, fisheries management measures, markets, BREXIT, EMFAF)?
3. What **current management decisions** have been adopted to **maintain** the fleet **in balance** (e.g. reduction of fishing capacity, flexibility in quota management, financial support, SWAPs)?
4. Is the **permanent cessation program** effective at managing fleet balance? What are other solutions and why could these be effective?
5. What is causing **inactivity in the fleets** (e.g. quota shares and quota distribution) and what management measures can be used to mitigate this (e.g. harbour quota pools)?
6. What **future opportunities and management measures** can be used to improve implementation of fleet balance indicators (e.g. harbour quota pools) and how?

## Appendix 2: Preliminary research: Danish quota Pools

### **Danish quota pools to mitigate restrictive individual quotas and enhance use of fleet capacity in the Danish North Sea demersal mixed fishery:**

There are not any relevant published studies documenting and examining the effects of the Danish fish/shellfish quota pool system for individual transferrable quotas (ITQ) and individual transferable vessel quotas (ITVQ), also referred to as the Danish harbour pools. Most Danish vessels are members of a quota pool (see e.g., a list from 2023 with an overview of Danish vessels registered under the quota pool system in 2021: <https://fiskeristatistik.fiskeristyrelsen.dk/stat/puljer/medlem21.html>).

The explicit objective of the quota pools is to rent, rent out, or swap / exchange individual quotas between pool member vessels in order to obtain the best possible use and exploitation of the individual vessel quotas, and the pool quotas. This can increase the profitability of the vessels and the optimal quota use according to vessel and fleet capacity (see e.g., purpose in: <http://hhf.dk/foreningen/puljefiskeren/> - In Danish).

A pilot investigation made on vessel specific quota shares compared to their individual catch, as well as on the quota shares by the harbour quota pools which the individual vessels are members of, covering important Danish vessels and species (stocks) in the Danish North Sea mixed demersal fishery in 2023. This analysis below shows the following:

1. Vessels for the pilot investigation of key vessels were selected according to having above 100 tonnes of landings or above 100 tonnes of quota or both for 2023 for cod, saithe, haddock, hake, plaice, and above 10 tonnes of landings or above 10 tonnes of quota or both for 2023 for sole, anglerfish, Norway lobster, totally covering the most important stocks / species in the Danish mixed demersal fishery in the North Sea. The data are available from public Danish fisheries statistical databases mediated through the Danish Fisheries Directorate: <https://fiskeristyrelsen.dk/fiskeristatistik/statistik-for-fiskeriets-regulering/fartoejers-andele-og-landinger#c109032>.
2. For the Danish mixed demersal fisheries in the North Sea in 2023, 14 main vessels are holding more than 50% of the quota and catch/landing of key investigated species in the Danish North Sea demersal mixed fishery. All 14 vessels are members of a quota pool. The pilot investigation also documented the relative share the quota pool owned of the total Danish quota in the North Sea for each of the key species cod, saithe, haddock, hake and plaice when comparing catches and individual quota shares for those 14 vessels. The investigation strongly indicates that the quota pools must have been used for exchange (swaps) to mitigate restrictive quotas compared to factual catches for those key vessels (Table 1).

3. For all Danish vessels participating in the Danish North Sea mixed demersal fisheries, the frequencies and relative frequencies for each of the above species were documented for the below categories where nearly all vessels were member of a quota pool. This pilot investigation also strongly indicates that the quota pools must have been used for exchange (swaps) in order to mitigate restrictive quotas compared to factual catches on vessel basis (Table 1):
  - (a) No vessels w. quota (>10 ton) and catch around individual vessel quota
  - (b) No. vessels w. quota (>10 ton) and catch << less than quota
  - (c) No. vessels w. quota (> 10 ton) and catch >> more than quota
  - (d) No. vessels w. quota (>10 ton) and no catch
  - (e) No. vessels w. no quota and significant catch (>10 ton)
  - (f) No. vessels w. low quota and significant catch (>10 ton)
4. The pilot investigations for each of the key species shows:

**Cod:** In general, for these vessels and their harbour pools, their Danish North Sea cod quota is taken (limiting) and transfers conducted. Some vessels do not have a share, but still a quota, which indicates transfers within or between pools to mitigate that. The full quota is allocated to vessels that are members of a pool which gives full flexibility of quota transfers. For Danish vessels having either more than 10 tonnes quota or 10 tonnes catch, or both, of North Sea cod they are in number dominated by vessels having catch around the quota (~30%), vessels having much more catch than the quota (~20%) and vessels with quota and no catch (~30%), while vessels with catch much less than the quota accounts for ~15%.

**Saithe:** In general, for these vessels and their harbour pools, their Danish North Sea saithe (pollock) quota is taken (limiting) and transfers conducted to mitigate that. The full quota is allocated to vessels that are members of a pool which gives full flexibility of quota transfers. For Danish vessels having either more than 10 tonnes quota or 10 tonnes catch or both of North Sea saithe they are in number dominated by vessels having catch around the quota (~40%), vessels having much less catch than the quota (~20%) and vessels with quota and no catch (~15%).

**Haddock:** In general, for these vessels and their harbour pools, their Danish North Sea haddock North Sea quota is not taken (and not limiting). The full quota is allocated to vessels that are members of a pool which gives full flexibility of quota transfers. For Danish vessels having either more than 10 tonnes quota or 10 tonnes catch or both of North Sea haddock they are in number dominated by vessels having much less catch than the quota (~55%) and vessels with quota and no catch (~20%).

**Hake:** In general, for these vessels and their harbour pools, their Danish North Sea hake quota is not taken (and not limiting). The full quota is allocated to

vessels that are members of a pool which gives full flexibility of quota transfers. For Danish vessels having either more than 10 tonnes quota or 10 tonnes catch or both of North Sea hake they are in number dominated by vessels having much less catch than the quota (~55%) and vessels with quota and no catch (~35%).

**Plaice:** In general, for these vessels and their harbour pools, their Danish North Sea plaice quota is not taken (and not limiting). The full quota is allocated to vessels that are members of a pool which gives full flexibility of quota transfers. For Danish vessels having either more than 10 tonnes quota or 10 tonnes catch or both of North Sea plaice they are in number dominated by vessels having much less catch than the quota (~45%) and vessels with quota and no catch (~40%).

5. Conclusions: This pilot study showed that exchange (swaps) on vessel basis and by species within the pools must have taken place according to the frequencies for species where individual quotas have been taken and been restrictive compared to the vessel specific landings/catches.

Accordingly, it is evident that the Danish quota pools mitigate quota restrictions on vessel basis for key species (stocks) when enabling to rent, rent out, or swap / exchange individual quotas between pool member vessels in order to obtain the best possible use and exploitation of the individual vessel quotas and the pool quotas, and in that way increase the profitability of the vessels and the optimal quota use according to available capacity among main vessels in the fishery.



**Table 1** Overview of catches and individual quota shares by species in 2023 for 14 main vessels holding more than 50% of the quota and catch/landing of key investigated species in the Danish North Sea demersal mixed fishery. All 14 vessels are members of a quota pool. Furthermore, the quota shares by the harbour quota pools which the individual vessels are members of are also shown. The lower part of the table shows frequencies and relative frequencies of main categories of relationships between individual vessel quotas and their catches for the key species covering the fishery in 2023 for the full Danish fleet participating in the North Sea mixed demersal fisheries.

| Species / Area                                    |                                                              | Cod North Sea (2AC4) |              |            |            |
|---------------------------------------------------|--------------------------------------------------------------|----------------------|--------------|------------|------------|
| Year                                              | Vessel / Pool                                                | Quota Pool           | Share (0/00) | Quota (kg) | Catch (kg) |
| 2023                                              | 6618 - Puljefiskeren                                         | 6618                 | 114.25       | 359321     | 348993     |
|                                                   | 6660 - Dansk Puljefiskeri                                    | 6660                 | 882.51       | 2620179    | 2588896    |
|                                                   | Other                                                        | Other                | 3.24         |            |            |
|                                                   | Vessel 1                                                     | 6660                 | 0.00         | 112713     | 120097     |
|                                                   | Vessel 2                                                     | 6660                 | 50.00        | 116996     | 328024     |
|                                                   | Vessel 3                                                     | 6618                 | 34.71        | 103076     | 114321     |
|                                                   | Vessel 4                                                     | 6618                 | 48.82        | 142371     | 143058     |
|                                                   | Vessel 5                                                     | 6660                 | 21.50        | 58273      | 108540     |
|                                                   | Vessel 6                                                     | 6660                 | 50.00        | 135516     | 107033     |
|                                                   | Vessel 7                                                     | 6660                 | 54.78        | 148473     | 0          |
|                                                   | Vessel 8                                                     | 6660                 | 47.30        | 115832     | 152530     |
|                                                   | Vessel 9                                                     | 6660                 | 49.99        | 136355     | 252829     |
|                                                   | Vessel 10                                                    | 6660                 | 40.47        | 112212     | 287955     |
|                                                   | Vessel 11                                                    | 6660                 | 18.92        | 51280      | 152100     |
|                                                   | Vessel 12                                                    | 6660                 | 50.00        | 135516     | 220075     |
|                                                   | Vessel 13                                                    | 6660                 | 50.00        | 135516     | 0          |
|                                                   | Vessel 14                                                    | 6660                 | 50.00        | 135516     | 0          |
|                                                   | Sum single vessels                                           |                      | 566.49       | 1639645    | 1986562    |
|                                                   | Percent                                                      |                      | 57           | 55         | 68         |
| Transfers within species and likely within pools: |                                                              |                      |              |            |            |
|                                                   |                                                              |                      | Frequency    | Rel. Freq. |            |
| a)                                                | No vessels w. quota (>10 ton) and catch around quota         |                      | 17           | 28         |            |
| b)                                                | No. vessels w. quota (>10 ton) and catch << less than quota  |                      | 8            | 13         |            |
| c)                                                | No. vessels w. quota (> 10 ton) and catch >> more than quota |                      | 12           | 20         |            |
| d)                                                | No. vessels w. quota (>10 ton) and no catch                  |                      | 17           | 28         |            |
| e)                                                | No. vessels w. no quota and significant catch (>10 ton)      |                      | 5            | 8          |            |
| f)                                                | No. vessels w. low quota and significant catch (>10 ton)     |                      | 1            | 2          |            |
| Sum                                               |                                                              |                      | 60           | 100        |            |

Table 1 (Continued).

| Saithe North Sea, Skagerrak, Kattegat (2C3A4) |            |              |            |            |
|-----------------------------------------------|------------|--------------|------------|------------|
| Vessel / Pool                                 | Quota Pool | Share (0/00) | Quota (kg) | Catch (kg) |
| 6618 - Puljefiskeren                          | 6618       | 312.83       | 677769     | 644230     |
| 6660 - Dansk Puljefiskeri                     | 6660       | 730.73       | 1661667    | 1610245    |
| Other                                         | Other      | -43.56       |            |            |
| Vessel 1                                      | 6660       | 0            | 127570     | 146809     |
| Vessel 2                                      | 6660       | 55.37        | 96198      | 249619     |
| Vessel 3                                      | 6618       | 59.95        | 137805     | 156593     |
| Vessel 4                                      | 6618       | 101.7        | 216811     | 220336     |
| Vessel 5                                      | 6660       | 47.32        | 100880     | 117680     |
| Vessel 6                                      | 6660       | 4.29         | 9146       | 65894      |
| Vessel 7                                      | 6660       | 9.2          | 19613      | 0          |
| Vessel 8                                      | 6660       | 70.29        | 125246     | 141922     |
| Vessel 9                                      | 6660       | 33.22        | 70820      | 72180      |
| Vessel 10                                     | 6660       | 22.12        | 50322      | 98349      |
| Vessel 11                                     | 6660       | 17.88        | 38118      | 48207      |
| Vessel 12                                     | 6660       | 45.33        | 96637      | 119109     |
| Vessel 13                                     | 6660       | 3.88         | 8272       | 0          |
| Vessel 14                                     | 6660       | 64.21        | 136888     | 0          |
| Sum single vessels                            |            | 534.76       | 1234326    | 1436698    |
| Percent                                       |            | 51           | 53         | 64         |

| Transfers | Frequency | Rel. Freq. |
|-----------|-----------|------------|
| a)        | 19        | 42         |
| b)        | 9         | 20         |
| c)        | 5         | 11         |
| d)        | 7         | 16         |
| e)        | 2         | 4          |
| f)        | 3         | 7          |
| Sum       | 45        | 100        |

Table 1 (Continued).

| Haddock North Sea (2AC4)  |            |              |            |            |
|---------------------------|------------|--------------|------------|------------|
| Vessel / Pool             | Quota Pool | Share (0/00) | Quota (kg) | Catch (kg) |
| 6618 - Puljefiskeren      | 6618       | 146.33       | 426776     | 183089     |
| 6660 - Dansk Puljefiskeri | 6660       | 857.21       | 2440529    | 941979     |
| Other                     | Other      | -3.54        |            |            |
| Vessel 1                  | 6660       | 50.44        | 113192     | 8040       |
| Vessel 2                  | 6660       | 84.98        | 211086     | 44555      |
| Vessel 3                  | 6618       | 34.35        | 90966      | 24571      |
| Vessel 4                  | 6618       | 100.00       | 264820     | 92138      |
| Vessel 5                  | 6660       | 31.69        | 83922      | 20730      |
| Vessel 6                  | 6660       | 39.50        | 104603     | 4575       |
| Vessel 7                  | 6660       | 19.96        | 52859      | 0          |
| Vessel 8                  | 6660       | 62.47        | 157547     | 43755      |
| Vessel 9                  | 6660       | 64.55        | 170942     | 155529     |
| Vessel 10                 | 6660       | 37.55        | 99441      | 100516     |
| Vessel 11                 | 6660       | 18.92        | 51280      | 152100     |
| Vessel 12                 | 6660       | 50.00        | 135516     | 220075     |
| Vessel 13                 | 6660       | 50.00        | 135516     | 0          |
| Vessel 14                 | 6660       | 50.00        | 135516     | 0          |
|                           | 694.41     | 1807206      | 866584     |            |
|                           | 69         | 63           | 77         |            |

| Transfers | Frequency | Rel. Freq. |
|-----------|-----------|------------|
| a)        | 4         | 12         |
| b)        | 18        | 55         |
| c)        | 0         | 0          |
| d)        | 7         | 21         |
| e)        | 2         | 6          |
| f)        | 2         | 6          |
| Sum       | 33        | 100        |

Table 1 (Continued).

| Hake North Sea (2AC4-C)   |            |              |            |            |
|---------------------------|------------|--------------|------------|------------|
| Vessel / Pool             | Quota Pool | Share (0/00) | Quota (kg) | Catch (kg) |
| 6618 - Puljefiskeren      | 6618       | 54.97        | 140028     | 17137      |
| 6660 - Dansk Puljefiskeri | 6660       | 945.23       | 1975884    | 528702     |
| Other                     | Other      | -0.2         |            |            |
| Vessel 1                  | 6660       | 0.00         | 1308       | 1308       |
| Vessel 2                  | 6660       | 100.00       | 207436     | 2146       |
| Vessel 3                  | 6618       | 10.11        | 21033      | 406        |
| Vessel 4                  | 6618       | 20.91        | 43500      | 2204       |
| Vessel 5                  | 6660       | 5.93         | 12336      | 1300       |
| Vessel 6                  | 6660       | 77.03        | 160253     | 2595       |
| Vessel 7                  | 6660       | 4.21         | 8759       | 0          |
| Vessel 8                  | 6660       | 75.54        | 156601     | 1245       |
| Vessel 9                  | 6660       | 41.43        | 86191      | 66906      |
| Vessel 10                 | 6660       | 49.10        | 102147     | 39008      |
| Vessel 11                 | 6660       | 33.32        | 69318      | 23690      |
| Vessel 12                 | 6660       | 80.88        | 168262     | 80203      |
| Vessel 13                 | 6660       | 31.55        | 65637      | 0          |
| Vessel 14                 | 6660       | 26.67        | 55485      | 0          |
|                           | 556.68     | 1158266      | 221011     |            |
|                           | 56         | 55           | 40         |            |

| Transfers | Frequency | Rel. Freq. |
|-----------|-----------|------------|
| a)        | 2         | 7          |
| b)        | 15        | 56         |
| c)        | 0         | 0          |
| d)        | 9         | 33         |
| e)        | 1         | 4          |
| f)        | 0         | 0          |
| Sum       | 27        | 100        |

Table 1 (continued)

| Plaice North Sea (2AC4) |            |              |            |            |
|-------------------------|------------|--------------|------------|------------|
| Vessel / Pool           | Quota Pool | Share (0/00) | Quota (kg) | Catch (kg) |
| 6618 - Puljefiskere     | 6618       | 75.75        | 1351947    | 208806     |
| 6660 - Dansk Pulje      | 6660       | 926.67       | 164458999  | 3068291    |
| Other                   | Other      | -2.42        |            |            |
| Vessel 1                | 6660       | 9.07         | 156674     | 1          |
| Vessel 2                | 6660       | 5.44         | 96629      | 6225       |
| Vessel 3                | 6618       | 32.18        | 571601     | 77459      |
| Vessel 4                | 6618       | 0.12         | 2130       | 3770       |
| Vessel 5                | 6660       | 13.65        | 242460     | 123574     |
| Vessel 6                | 6660       | 43.75        | 777115     | 508        |
| Vessel 7                | 6660       | 43.00        | 763793     | 0          |
| Vessel 8                | 6660       | 8.80         | 156281     | 56549      |
| Vessel 9                | 6660       | 34.46        | 612099     | 834        |
| Vessel 10               | 6660       | 17.34        | 308004     | 42945      |
| Vessel 11               | 6660       | 11.15        | 198052     | 92752      |
| Vessel 12               | 6660       | 17.35        | 308005     | 5892       |
| Vessel 13               | 6660       | 56.37        | 1000278    | 0          |
| Vessel 14               | 6660       | 41.90        | 744254     | 0          |
|                         | 334.58     | 5937375      | 410509     |            |
|                         | 33         | 4            | 13         |            |

| Transfers (pl: | Frequency | Rel. Freq. |
|----------------|-----------|------------|
| a)             | 7         | 7          |
| b)             | 43        | 43         |
| c)             | 4         | 4          |
| d)             | 38        | 38         |
| e)             | 4         | 4          |
| f)             | 3         | 3          |
| Sum            | 99        | 100        |

## Annex 3: International Case studies

The following section describes selected experiences from countries in five continents where a variety of capacity management systems have been implemented. These are: Europe (Iceland, Norway and UK), Africa (South Africa), Asia (China), Oceania (New Zealand), and the Americas (USA).

### Case study 1: Iceland

#### Background

The fishing industry in Iceland is one of the most important sectors of the national economy. According to official data, fisheries and aquaculture accounted for 3.5% of national GDP in 2023, with fisheries alone accounting for 3.3% <sup>(110)</sup>. Over the past four decades, Iceland has implemented various management measures aimed at both conserving the resource and improving the economic performance of the sector. Iceland was one of the first countries in the world to implement a fully-fledged ITQ system and is a global reference for the implementation of these systems. Iceland introduced the ITQ system primarily to address the problems of overfishing and overcapacity in its fisheries. In the late 1970s, Iceland faced significant challenges with escalating overfishing and poor economic performance that threatened the sustainability of fish stocks (OECD, 2011).

The problem of overcapacity emerged in the 1970s with the extension of fishing jurisdiction (EFJ) to 200 nautical miles of exclusive economic zone (EEZ) and the expansion of the domestic fleet (Runolfsson and Arnason, 2001). In 1979, the ITQ system was introduced in the Icelandic herring fishery. In 1984, the demersal fisheries were included in the system. This included the management of cod, which is the country's most important economic resource. In 1990, the Fisheries Act came into force and most of the commercially important fisheries were included in a single ITQ system, with the exception of the small-scale fleet. By 2004, the entire Icelandic fishing fleet was subject to the ITQ system (OECD, 2011).

The full implementation of the Icelandic ITQ system was justified because it provided predictability and flexibility compared to the TAC quota system alone. With the transferability of quotas, the system would be more flexible, and capital would be used more efficiently (Eythorsson, 2000). Icelandic economists also argued that the efficiency created by ITQs could provide a basis for resource rent

---

<sup>(110)</sup> See Statistics Island, [https://px.hagstofa.is/pxen/pxweb/en/Efnahagur/Efnahagur\\_thjodhagsreikningar\\_framlup\\_pgj\\_ISAT2008/THJ08401.px](https://px.hagstofa.is/pxen/pxweb/en/Efnahagur/Efnahagur_thjodhagsreikningar_framlup_pgj_ISAT2008/THJ08401.px)

management, which would become an important source of income for society as a whole. The system introduced in the 1990s was the result of a long evolution from preliminary experiences in the 1970s. Earlier initiatives met with some resistance from the industry, but the widespread adoption of the system was welcomed by the industry because of the large potential economic benefits (Runolfsson and Arnasson, 2001).

### **Fishing capacity instruments**

These quotas are characterized as permanent, fully divisible and transferable with minor restrictions. Regarding the ownership of quotas, the system introduced in 1990 imposed three restrictions: (a) ITQs must be tied to a fishing vessel, (b) foreigners may not own harvesting companies, and (c) the total ITQs held by a single company may not exceed a certain limit. The first limits were 10% for demersal species (Runolfsson and Arnason, 2001) and 20% for pelagic species (Saevaldsson and Gunnlaugsson, 2015). These limits have been subject to change and can vary considerably between species. OECD (2011) reported 12% for cod and 35% for redfish. Some flexibility is allowed in the use of quotas, and quota holders are allowed to carry over 20% of their quota share to the following year. Quota uptake can exceed a maximum of 5%, provided that this amount is deducted from the following year's allocation. The ITQ system has evolved in parallel with the restructuring of the fleet. Restrictions on new vessel construction and fleet renewal have been in place since the late 1970s to deal with overcapacity. Restrictions co-existed with the ITQ system for a number of years, but further flexibility for new construction was introduced in the 1990s.

### **Outcomes of the interventions**

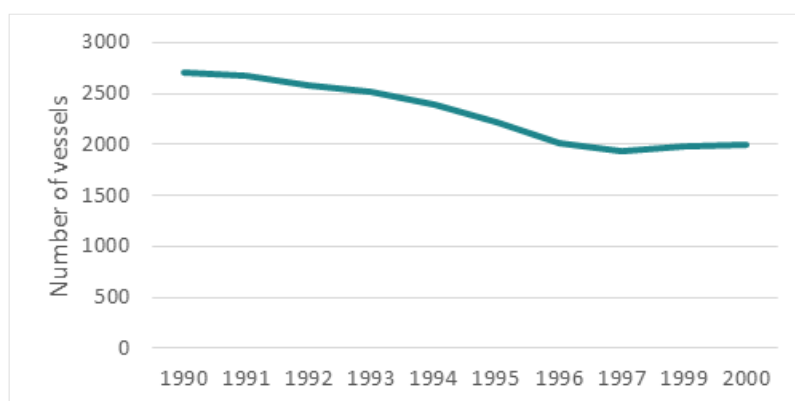
The full implementation of the ITQ system has led to a reduction in the number of vessels of around 43% (see Figure 44). Thus, the transferability of quotas seems to have created incentives for vessel owners to rationalise their fleets by eliminating redundant fishing capacity. By the early 2000s, the fleet had shrunk by around 700 units. This may be the result of the transferability inherent in the ITQ system, but it is worth adding that in the 1980s the Icelandic authorities introduced several complementary financial mechanisms to accelerate the process of fleet reduction (OECD, 2009). In fact, several publicly funded decommissioning funds were in place during these years to reduce capacity, but they did not produce the expected results. In 1994, the industry-funded Development Fund for Fisheries (DFF) was established to reduce capacity in both the fleet and processing sectors. The DFF was financed by levies and other charges and supplemented by government funds. The levies were initially based on GRT and then on tonnes of quota. The initiative was successful, as most of the expenditure for the purchase of vessels was incurred in the first year. In the period 1994-1998, IKR 3.2 million was spent on decommissioning vessels and installations, of which 87% was spent on fleet reduction. 459 vessels with a total of 7 829 GRT were withdrawn. As a result, the relative quota per vessel increased, while efficiency and profitability improved.



In contrast, Runolfsson and Arnason (2001) reported a reduction in fishing effort of around 35%. However, GRTs decreased only slightly. According to Runolfsson (1999), the introduction of the ITQ system triggered a restructuring of the fleet. After the restrictions on fleet renewal were relaxed, vessels in some of the larger fleet segments, e.g. deep-sea trawlers, became larger to accommodate processing equipment on board. A typical freezer trawler can steam for up to 30 days or more, depending on the fishing grounds. Accommodation and comfort for crews was also provided (Runolfsson and Arnason, 2001). This may have led to an increase in the GRT of these fleet segments. Entry/exit rules have also been introduced in Icelandic fisheries. The introduction of ITQs for vessels over 10 GT (1984) led to an increase in the number of smaller vessels. The entry of new vessels had to be balanced by the exit of an old vessel.

In 1991, all vessels over 6 GT were included in the ITQ system, leading to a further reduction in the size of this fleet (Runolfsson and Arnason, 2001). The introduction of ITQs has improved economic performance but has been criticised for its impact on fishing communities. Solutions to address social hardship have been implemented, such as the creation of dedicated quotas for hook-and-line fisheries (2009), community quotas, and an effort-based coastal fishery (Chamber and Carrothers, 2017). The ITQ system is subject to a thorough revision due to increasing criticism of quota consolidation and concentration of wealth from a public resource. This would result in legislative changes <sup>(111)</sup>. The status of stocks may have improved as a result of fisheries management, although this is difficult to assess in isolation from environmental factors. Byrne (2021) suggests that there has been rebuilding of key demersal stocks, particularly cod, which has improved the performance of the fleet. This is difficult to assess as the increasing abundance of new pelagic species may also have contributed to improved performance.

**Figure 44 – Evolution on fleet size – number of vessels after ITQs implementation in Iceland**



<sup>(111)</sup> <https://www.icelandreview.com/news/society/four-working-groups-to-overhaul-icelands-fisheries-legislation/>

*Data source:* Statistics Island.

## **Applicability in the EU context**

This case study shows that ITQs in Iceland were introduced to address pressing problems such as the accumulation of capacity in the country's diverse fleets. These problems also required government intervention to remove unused capacity and to set entry/exit rules. This experience led to the design of the ITQ system in the early 1990s. This has led to a profound transformation of the fisheries sector, particularly in terms of fleet structure, and improved economic performance, although the social costs appear to have been high. Measures have also been taken to alleviate social hardship. There are a number of parallels with the EU's experience in managing fleet capacity. First, ITQs have been used in several Member States in recent decades, although not in such a compressive way, see for example the case of Spanish ITQs in the offshore fleets operating in NEAFC and NAFO. In these cases, the fleet has also suffered a large reduction in the number of vessels. Public support and exit schemes have also been introduced to address capacity problems. In the EU, the social hardship resulting from this intervention has been alleviated through economic compensation for temporary and permanent cessation of fishing activities and the possibility to transfer the rights of the decommissioned vessels to other vessels in the same fleet segment.

## **References**

- Eythorsson, E. (2000) A decade of ITQ-management in Icelandic fisheries: consolidation without consensus. *Marine Policy*, 24(6), 483-492.
- Byrne, C. (2021). Insights into the performance of Iceland's ITQ system in the context of sustainable development. (PhD thesis. University of Iceland)
- Chambers, C., & Carothers, C. (2017). Thirty years after privatization: A survey of Icelandic small-boat fishermen. *Marine Policy*, 80, 69-80.
- OECD (2009). Reducing fishing capacity. Best practices for decommissioning schemes. OECD Publishing.
- Runolfsson, B. (1999). On the management measures to reduce overcapacity in Icelandic fisheries. A Report to the Ministry of Fisheries, Reykjavik.
- Runolfsson, B., & Arnason, R. (2001). Initial allocation of ITQs in the Icelandic fisheries. *FAO Fisheries Technical Paper*, 24-31.
- Saevaldsson, H., & Gunnlaugsson, S. B. (2015). The Icelandic pelagic sector and its development under an ITQ management system. *Marine Policy*, 61, 207-215.

## Case study 2: South Africa – Cape hake fishery

### Background

The South African hake deep-sea trawl (HDS) fishery is the most important fishery in the country in terms of value, accounting for 50% of the national fishery value (Cooper et al. 2014). It is based on two species: Deep-water Cape hake and Shallow-water Cape hake. In 2016, the fishery had a value of around EUR 342 million and employed 300 000 people. It is also the second most important fishery in terms of volume after anchovy (Siyema, 2010). The HSD fishery is highly capitalized and vertically integrated, and this situation appears to be due to the implementation of rights-based management in the country. The expansion of capacity is in response to management measures such as TACs and effort controls (Siyema, 2010). In the late 1990s, it was decided that the fishery should be managed through individual rights. These are essentially individual, non-transferable rights. In 2000, medium-term fishing rights were allocated in the HDS fishery. It appears that fishing companies are rapidly building capacity in preparation for the implementation of the process. In fact, at the end of the 1990s, 60 vessels were added to the fleet. By 2000, the number had risen to 94 vessels. It was reported that in the following years not all vessels were used. Long-term fishing rights (LTR) were introduced in 2006. 82 vessels were active that year. In 2025, the government increased the quotas for several species by 36% for small-scale fisheries, with the aim of facilitating inclusive growth and revitalising coastal communities <sup>(112)</sup>.

### Fishing capacity instruments

In South Africa the system of fishing rights allows no person to hold a fishing permit without the fishing right. The HDS fisheries employ a system that combines fishing effort in terms of the day at sea, which is based on the engine power and quota per vessel. This approach was proposed by the South Africa Deep Sea Trawling Association (SADSTIA) following a call from the Ministry of Marine and Coastal Management (MCM). The rationale was that in the previous ten years the fleet had grown in power by about 40%. It appears that fishery required an approach based on inputs and outputs due to previous experiences with either system caused effort creep and high grading, respectively (Siyema, 2010).

### Outcomes of the interventions

Since 2006, the number of vessels has declined (**Figure 45**). The industry has undergone significant restructuring despite the absence of ITQs. It appears that the process of company mergers and acquisitions has determined the current level of fleet capacity (Cooper et al. 2014). In terms of stock status, the hake trawl fishery was MSC certified in 2004, the first hake fishery in the world to be so

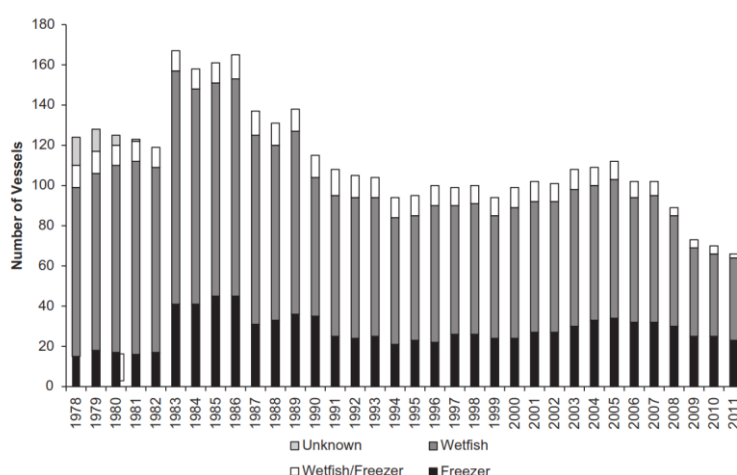
<sup>(112)</sup> [https://www.dffe.gov.za/mediarelease/george\\_fishallocationincrease](https://www.dffe.gov.za/mediarelease/george_fishallocationincrease)

certified. It has been reassessed and re-certified in 2009, 2015 and 2021 (expiring in 2026). There is a growing social concern in coastal communities due to the restricted access to fishing opportunities that has arisen from the consolidation of quotas in industrial companies <sup>(113)</sup>.

### Applicability in the EU context

To the best of our knowledge, a system of fishing days based on engine power and quotas has not been applied in the EU. The active consultative process used in South Africa to find solutions to capacity issues could be replicated in the EU, and the ad hoc working groups of the Advisory Councils are well placed to act as participatory platforms on technical issues where the sector and scientists can discuss potential approaches <sup>(114)</sup>.

**Figure 45 – Fleet size evolution in South Africa in number of vessels**



Source: Cooper et al. 2014

### References

- Cooper, R., Leiman, A., & Jarre, A. (2014). An analysis of the structural changes in the offshore demersal hake (*Merluccius capensis* and *M. paradoxus*) trawl fishery in South Africa. *Marine Policy*, 50, 270-279.
- Siyema, T. (2010). Overcapacity in the South African hake deep sea trawl fishery, South Africa (Master's thesis, Universitetet i Tromsø).

<sup>(113)</sup> <https://www.dailymaverick.co.za/article/2023-11-05-quota-quagmire-and-the-crisis-of-fishing-boats-unable-to-fish/>

<sup>(114)</sup> See the study on CFP Regionalization (ILVO et al. 2022).

## Case study 3: New Zealand

### Background

In 1978, New Zealand extended its fishing jurisdiction to 200 nautical miles and the resources found in these waters. This encouraged the country to develop a national fishing industry. Before the EFJ, distant water fishing fleets (DWFF) operated in these waters with little control. In the 1980s, licensed DWFFs still dominated offshore fishing in the national EEZ. Then New Zealand introduced financial assistance and tax breaks for national entrepreneurs to invest in offshore fleets and exploit the new fishing grounds. This aid was used to build large and modern offshore capacity. But overcapacity and overfishing soon became a problem, with spillover effects on inshore fisheries (Strakker et al. 2002). In 1983, the government introduced the first experience with non-transferable quotas in deep-sea fisheries. In 1986, all fisheries were brought under a comprehensive ITQ system called the Quota Management System (QMS), which allocated fully transferable rights in perpetuity to national boat owners. The aim of this decision was to address overfishing, overcapacity and discards (Hersoug, 2018).

### Fishing capacity instruments

New Zealand has used ITQs as the main tool to balance fishing capacity and opportunities. The system was introduced at a time when neo-liberal policies were being introduced, and many public assets and services were being privatized. As a result, the government did not implement any form of state-funded support for the fisheries sector. Fishing rights were granted in perpetuity and, although fully transferable, included some limits on concentration, i.e. 20% and 35% for inshore and offshore fishing respectively (Aranda and Christensen, 2009). Initially allocated in fixed tonnages, rights were later allocated as a percentage of the TAC for a given stock to better reflect the dynamic nature of fish stocks (Mace et al. 2013). This move appears to have provided a robust mechanism for dealing with natural fluctuations in the abundance of individual fish stocks (Cryer et al. 2016).

The implementation of the QMS involves a number of complementary mechanisms. The paper trail system monitors the value chain from the sea to the consumer to ensure that traded fish are caught in the correct fishing area; the cost recovery system charges industry for research, management and compliance; and the deemed value system is in place to discourage discarding of by-catch species (Aranda and Christensen, 2009).

### Outcomes of the interventions

The introduction of the QMS triggered a process of fleet restructuring, including modernisation, changes in ownership and target species. In the early years of the QMS, the inshore fleet (< 12 m; 12 - 24 m) declined in number and was replaced by fewer but larger and more modern vessels. Instead, the offshore fleet (> 24 m)

increased in numbers to replace chartered vessels and to build a competitive and specialized national fleet (Connor, 2001). After two decades, the reduction in inshore capacity and the growth of the offshore sector were two notable outcomes of QMS implementation. Managers interviewed at the time felt that potential overcapitalization was not a government concern, but a private decision, and therefore there was no public support for the withdrawal of redundant capacity (Aranda and Christensen, 2009). The structure of the industry as a whole also changed, as most of the right holders that exited the business were horizontally integrated companies. Quotas were then concentrated in large vertically integrated companies with modern processing facilities (Steward et al. 2006).

The introduction of Annual Catch Entitlements (ACEs) in 2001 appears to have made transactions between operators more flexible, while at the same time stimulating the growth of a market in fishing rights. Indeed, operators with fewer rights, in particular small-scale fishermen, are able to lease rights on the market. This also helps to compensate for overshooting individual allocations for some stocks in mixed fisheries, thereby preventing discards. The current ACE system does not seem to satisfy everyone, with some operators calling for a proportion of ACE to be ring-fenced for tendering by small-scale fishers only (Steward and Leaver, 2015). Cryer et al. (2016) suggest that the QMS has been successful in addressing capacity issues in New Zealand, leading to significant reductions in fishing effort. This has had benefits for stock status, with a high proportion of stocks showing favourable status relative to MSY-related reference points, as well as for bycatch.

However, the practice of discarding within the QMS is a rising concern and has led the government to strengthen its monitoring of onboard fishing activities. A consultation on improvements to the Fisheries Act is currently open. These improvements will include measures to address discarding issues <sup>(115)</sup>.

### **Applicability in the EU context**

In the EU, the use of ITQs has led to concentration in some fleets and a reduction in fleet capacity. However, there is no market in rights as there is in New Zealand. It appears that the EU POs play a key role in the exchange of rights by reducing transaction costs. In addition, rights in the EU have historically been tied to vessels and are generally only available to professional fishermen. An exceptional example of quotas not being held by active fishermen was seen in the UK with dummy license holders. In the EU, there is flexibility in the management of rights, which facilitates the adjustment of capacity to the needs of fishing activity. The institutional nature of the fishing activity, with POs and rules for exclusive professional trading of rights, may mitigate the social impact of a wider introduction of ITQs.

---

<sup>(115)</sup> <https://www.beehive.govt.nz/release/consultation-opens-fisheries-reforms>

## References

- Aranda, M., & Christensen, A. S. (2009). The New Zealand's quota management system (QMS) and its complementary mechanisms. Comparative evaluations of innovative fisheries management: global experiences and European prospects, 19-41.
- Cryer, M., Mace, P. M., & Sullivan, K. J. (2016). New Zealand's ecosystem approach to fisheries management. *Fisheries Oceanography*, 25, 57-70.
- Hersoug, B. (2018). "After all these years"—New Zealand's quota management system at the crossroads. *Marine Policy*, 92, 101-110.
- Mace, P. M., Sullivan, K. J., & Cryer, M. (2014). The evolution of New Zealand's fisheries science and management systems under ITQs. *ICES Journal of Marine Science*, 71(2), 204-215.
- Stewart, J., & Leaver, J. (2015). Efficiency of the New Zealand annual catch entitlement market. *Marine Policy*, 55, 11-22.
- Straker, G., Kerr, S., & Hendy, J. (2002). A regulatory history of New Zealand's quota management system: Setting targets, defining and allocating quota.



## Case study 4: United States of America – Alaska pollock fishery

### Background

According to NMFS (2024), the US commercial fishing industry is an important sector of the national economy, contributing about USD 74 041 million in gross value added and employing about 1.6 million people. In 2022, catches for the commercial sector will be around 3.8 million tons. According to Boenish et al. (2018), nearly 500 fisheries are managed in the US in both the Pacific and Atlantic oceans. The Alaska pollock fishery is the largest fishery in the US in terms of volume and the sixth largest in terms of ex-vessel revenue (Criddle and Strong, 2013).

The main management tool used by the US federal government to manage the fishery is the Magnuson Stevens Act (MSA), which was enacted in 1976 as the Fisheries Conservation and Management Act (FCMA). The MSA's main aims are to prevent overfishing, rebuild depleted fish stocks, boost long-term economic and social benefits, ensure a seafood supply and protect marine habitats. The federal system manages fisheries beyond the jurisdiction of the states. These are fisheries that take place more than 3 nautical miles from shore. The federal system consists of eight regional fishery management councils, with the National Marine Fisheries Service (NMFS) as the primary agency.

In the mid-1970s, the presence of large Soviet and Japanese fishing fleets exploiting BSAI resources became a concern for managers. This led to the creation of the FCMA, under which the US had exclusive authority over 200 nautical miles off the US coastline. The aim was to Americanize offshore fisheries, particularly in the BSAI, and to build a national fleet capacity. The American Fisheries Act (AFA) was passed in 1998 to regulate and reduce overfishing in these fisheries and the rampant problem of overcapitalization. This Act is considered a major innovation in fisheries management (Criddle and Strong, 2013).

### Fleet capacity instruments

By the late 1980s, intense competition between motherships, catcher/processor vessels (the at-sea sector), and processing plants and their supply fleets, typically small vessels (the shoreside sector), led the latter to demand that the TAC be allocated among participants. After tense debates, also known as the 'pollock wars', the North Pacific Fisheries Management Council (NPFC) established ad hoc working groups and invited the sector to submit proposals (Strong and Criddle, 2013). By the early 1990s, it was clear that the BSAI fishery was experiencing a race for fish and overcapitalization, both in terms of harvesting and processing capacity. The situation was such that the combined capacity of the at-sea and shoreside sectors almost doubled the pollock TAC. According to

Hopkins et al. (2013), this resulted in shortened fishing seasons, discards, bankruptcies and closures. This appeared to be due to the lack of access regulations and the absence of a rights-based management regime (Criddle and Strong, 2013). At the time of the 'pollock wars', the Community Development Quota (CDQ) programme was established to promote the development of local coastal communities, including indigenous peoples (Wolff and Hauge, 2008). In 1992, the catcher-processor sector was allocated 35% of the industry TAC, while the at-sea sector was allocated 65%. The NPFC was also tasked with developing an Individual Fishing Quota (IFQ) system but failed, and Congress placed a moratorium on the system. In 1998, stakeholders called for the establishment of an IFQ system, which led Congress to enact the AFA (Strong and Criddle, 2013).

In 1998, the AFA earmarked shares of the pollock TAC for incidental catches (2.8%) and CDQ (10%). After these deductions, the industry share of the TAC was divided into permanent allocations, i.e. catcher/processor vessels (40%), motherships (10%), and shoreside catcher vessels (50%) (NPFC, 2012). After permanent allocations were established, the AFA implemented IFQs in the fishery. The AFA closed the fishery to new entrants. It established a series of procedures to identify eligible vessels and processors, allowed for the formation of cooperatives, set limits on AFA vessel participation in other fisheries, and imposed monitoring requirements on AFA vessels. The activities of the fleet are actively monitored and an observer programme with full coverage of the fleet is in place in the Bering Sea. Management decisions are supported by a system of harvest control rules (Hopkins et al. 2013). Co-management through cooperatives has also developed in this fishery (Wolff and Hauge, 2008).

The AFA aimed to reduce fishing capacity in US fisheries by phasing out larger vessels that were considered destructive to fisheries resources. It also tightened ownership rules and imposed restrictions on foreign ownership of fishing vessels. Sectors were also allowed to form cooperatives and lease CDQ quota. The AFA also implemented a buy-out programme, and nine catcher-processor vessels were decommissioned and their allowances distributed to those remaining in the industry. The decommissioning was paid for with public funds, but the sector had to reimburse the Treasury USD 75 million through a canon that charges for every pound landed. The sectoral allocation also allowed the CDP to lease quotas to the sectors. However, restrictions were placed on the exchange of quota between sectors. In the early 2000s, other fisheries such as groundfish, crab and scallop were also subject to IFQ schemes. Prior to IFQs, a system of limited licenses was in place to address fleet capacity, essentially based on historical catches (NPFMC, 2012). The AFA placed restrictions on pollock quota holders so that they could not concentrate on quotas in other fisheries (Criddle and Strong, 2013).

### **Outcomes of the interventions**

Under the AFA, cooperatives have been able to consolidate IFQs on the most efficient vessels through quota pooling. This has led to a reduction in the size of the fishing fleet, such as the number of motherships and their associated catcher

vessels. By 2013, the coastal cooperatives had reduced the number of coastal catcher vessels from 97 to 70. Production has also been optimized and diversified to better meet market demand (Criddle and Strong, 2013). It appears that the BSAI pollock fishery has been managed sustainably, achieving MSC certification in 2005 and re-certification since then. According to NOAA, the Aleutian Islands pollock stock is not overfished (2022 stock assessment) and not subject to overfishing based on 2023 catch data. The Eastern Bering Sea pollock stock is not overfished (2023 stock assessment) and not subject to overfishing based on 2023 catch data. Criddle and Strong (2013) argue that the AFA has failed to allow transferability between sectors, and potential revenues may have been lost. This is particularly relevant given that the inshore sector is more vulnerable to increases in fuel prices and decreases in fish prices. This may result in the fishery as a whole losing revenue if inshore fishing is no longer profitable. This could mean that, at some point in the future, the TAC will not be fully utilised by the more efficient sectors. Hopkins et al. (2013) also find that the prohibition of inter-sectoral quota transfers has reduced the ability of sectors to adapt to other challenges, such as the spatio-temporal distribution of pollock.

### **Applicability in the EU context**

The case of the pollock fishery shows that its management has the ability to address overfishing and fleet overcapacity through management instruments that distribute scientifically based fishing opportunities on the basis of dialogue with the sectors. Managers have found out the means to listen to the sectors and finding the means to improve governance through the creation of institutional structures that allow fishers to cooperate and contribute to management through a degree of co-management. Some of these elements are already in place in the EU, such as the establishment of sound TAC estimations and the creation of governance structures. In some Member States, OPs have been given the power to pool members' quotas, as was the case with the pollock cooperatives. In the EU, OPs have the possibility to look for fishing opportunities in other Member States and to request governments to negotiate quota swaps between countries. At Member State level, OPs also have the possibility to exchange quotas with other OPs. Thus, at least in this respect, the EU management system is more flexible than that applied to the BSAI pollock fishery where sector allocations cannot be exchanged between sectors. Nevertheless, the federal government has been able to withdraw idle capacity with funds that are fully recovered from the fishing sector. Thus, no public funds are used to reduce overcapacity. The system does not include a structural fund, such as the EMFAF and its precursors funds, to remove excess capacity. Decommissioning excess fleet capacity in the EU without full public support could require profound legal and institutional change and could face resistance from the fishing industry. This system has worked quite well in Alaska, given the high profitability of the fishing industry, which is based on a single species with a high acceptability in international markets.

## References

- Boenish, R., Willard, D., Kritzer, J. P., & Reardon, K. (2020). Fisheries monitoring: perspectives from the United States. *Aquaculture and Fisheries*, 5(3), 131-138.
- Criddle, K. R., & Strong, J. (2013). Dysfunction by design: consequences of limitations on transferability of catch shares in the Alaska pollock fishery. *Marine Policy*, 40, 91-99.
- Hopkins, C.C.E., Hadjimichael, M.M. & Wilson, D.W. 2013. Review of the fisheries governance system for Alaska pollock under the North Pacific Management Council: Objective setting and implementation. Contribution to Task 1.2 of the MYFISH project 'Maximising yield of fisheries while balancing ecosystem, economic and social concerns. EU FP7 Project No. 289257 MYFISH. 119 pp.
- NMFS (National Marine Fisheries Service). 2024. Fisheries Economics of the United States, 2022. U.S. Dept. of Commerce, NOAA Tech. Memo. NMFS-F/SPO-248A, 28 p.
- Strong, J., & Criddle, K. R. (2013). Fishing for pollock in a sea of change: a historical analysis of the Bering Sea pollock fishery. Alaska Sea Grant, University of Alaska Fairbanks.
- Wolff, F., & Hauge, K. H. (2009). Abundant fish stocks and profitable fisheries off Alaska—a study on harvest control rules and pollock cooperatives. *Comparative evaluations of innovative fisheries management: global experiences and European prospects*, 69-95.

## Case study 5: China

### Background

China has been the world's leading fish producer for many years. According to FAO (2024), China accounted for 14.3% of the world's capture fisheries, estimated at 92.3 million tonnes in 2022. In 2017, fisheries in China employed about 14 million people and contributed about USD 187.5 billion to the national GDP. In 2015, the size of the fishing fleet was estimated to be more than 1 million vessels, including both motorized and non-motorized vessels. The main management authority is the Bureau of Fisheries of the Ministry of Agriculture and Rural Affairs, formally known as the Ministry of Agriculture (MOA). Provincial administrations are also responsible for fisheries. A variety of management measures are in place in the country, particularly those that regulate inputs such as fishing licenses, technical measures such as engine power, gear and mesh sizes, closed and temporal seasons, and to a lesser extent output restrictions such as limiting total catch and fleet capacity (Yu and Yu, 2008; Shein and Heino, 2013). A notable feature of fisheries management in China is that the system of TACs is still under development, with only five pilot TACs in place to manage non-fish resources (Ding et al. 2023). Thus, there are no ITQs in the country.

### Fleet capacity instruments

The fishing license system is the main instrument for managing and controlling the country's fleet capacity. It was introduced in 1979. Fishing licenses can be issued to individuals, groups of people and state-owned enterprises. The license limits engine power and regulates technical measures such as fishing gear and mesh sizes. Yu and Yu (2008) argue that fishermen circumvent these restrictions through input substitution and that there are no effective incentives to reduce overcapacity. Other initiatives to control fleet capacity were taken in the 1980s, such as diverting large motorized vessels into offshore activities, reassigning workers from idle vessels to processing or aquaculture, and limiting the number of vessels. These measures were not successful. According to Shein and Heino (2014), in 1987 the MOA introduced a dual control system, first controlling the number of motorized vessels and then their horsepower. This included caps on horsepower by fishing zone (Yu and Yu, 2008). This system was revised in the late 1990s, but on both occasions the results were not as expected. It seems that these systems failed because of a problem of competition between provinces, each with its own objectives. Under input restrictions, fishers had incentives to substitute inputs to increase efficiency, even though they could not increase fleet capacity.

Particularly problematic is the case of small vessels, which increased in number in the second half of the 1980s. Fishing has been a refuge for unemployed people from agriculture who want to make a living from this activity. Other factors that have contributed to the growth of the fleet are changes in price controls that allow

economic benefits in some fisheries, and the inability to manage this huge expansion of fishing activity. The fishing license system has been reviewed, and major changes were made in 2002 when a quota system was proposed. The system was implemented in 2017 through five pilot TACs for different species of jellyfish and crustaceans and has faced various difficulties in its implementation, mainly due to the inability to exercise effective control because of a weak regulatory system. In 2000, the MOA launched the first census of the motorized fishing fleet, which found that out of 245 000 vessels, 28% were engaged in illegal activities without licenses or required certificates (Shein and Heino, 2014).

There are measures that attempt to regulate fleet capacity indirectly through time and area closures. These measures aim to protect resources from excessive fishing capacity (Yu and Yu, 2008). In the late 1990s, a zero growth policy for landings was introduced to control the increase in fleet capacity and protect resources. This policy changed to a negative growth policy in the 2000s. In the early 2000s, the MOA launched a publicly funded eight-year programme aimed at scrapping 30 000 vessels and 1.27 million kilowatts by 2010, along with their licenses (Yu and Yu, 2008). An entry/exit programme was also introduced, whereby no new construction can be approved until an old unit has been scrapped and the license is inherited by the new vessel. Workers made unemployed by the decommissioning programme have been redeployed in other ancillary activities.

The Distant Waters Fishing Fleet (DWFF), on the other hand, has expanded rapidly and is usually perceived by civil society and the media as engaging in unsustainable practices on the high seas and near the boundaries of third countries' EEZs, for example in South America, where the Chinese fleet is engaged in intensive squid fishing (Montecalvo et al. 2023). The size of the DWFF fleet in terms of number of vessels is uncertain, but in 2010 it was estimated to be around 1 800 vessels (Pauly et al. 2013). The Government of China in turn reports by 2022 the DWFF comprised 2 551 vessels, including 1 498 high seas fishing vessels (Government of China, 2023). The development of DWFF may have been aimed at developing employment opportunities and creating a competitive fishing sector (Montecalvo et al. 2023). Yu and Han (2021) refer to the policies supporting the development of the DWFF, which started in the mid-1990s and went through different stages until reaching a steady development period in 2016 - 2023. One of the main mechanisms for the development of the fleet has been the implementation of subsidies for the construction of vessels and fishing bases in other countries. According to Yu et al. (2025), China is making efforts to regulate the activities of its DWFF and prevent violations. According to the Chinese government, strict measures have been put in force to keep the number of DWF vessels below 3 000 and their output below 2.3 million tonnes. These control measures are being carried out in the framework of the 13<sup>th</sup> and 14<sup>th</sup> Five-Year Plan periods (2016 – 2020 and 2021 – 2025). A licensing system frames these control measures. The compliance system also attempts to identifying and penalizing IUU fishing activities (Government of China, 2023). The country's adoption of international instruments such as the FAO Agreement on



Port State Measures to Prevent, Deter and Eliminate IUU fishing, which is of particular interest for its activities in distant water fishing bases, would help to improve its compliance capacity beyond its EEZ. China is actively seeking to join this agreement (Government of China, 2023).

### **Outcomes of the interventions**

Policies aimed at preventing overfishing and fleet overcapacity represent a breakthrough in fisheries management, reverting and ever-increasing national production and a shift from quantitative expansion to quality and efficiency. The summer season has proved relatively effective in preventing overfishing in some fisheries but has led to intense fishing effort during the open seasons. Given the size of the fleet, the seasonal bans have caused social unrest, and public aid has been used to help fishermen cope with the temporary cessation of fishing activity. The dual control system has not produced the expected results, probably due to the inability of provincial governments to carry out rigorous inspections. This has led to the substitution of illegal inputs in some cases and the construction of illegal vessels in others. Social considerations related to income and employment may also have played a role.

The zero-growth and minus-growth programs have been effective in reversing the historical growth trend in Chinese landings. In fact, the rate of increase of landings has declined since the early 2000s. Shein and Heino (2014) report that these management measures have allowed a rationalization of the fleet in terms of the number of vessels, but there is an increasing trend in engine power. These authors suggest that ITQs may be an option in the future. This requires the implementation of a sound TAC system in the country. Policies to develop DWFFs and subsidies have led to a rush to build capacity, which is causing concern in developing regions due to intensive fishing close to EEZ boundaries and heavy exploitation in the high seas, particularly as China has not yet signed up to some key international maritime agreements.

### **Applicability in the EU context**

China's approach to fleet management differs from that of the EU in the predominance of input management measures, which require a robust enforcement system, which appears to be lacking in the country. Despite efforts to control the size of the fleet in terms of the number of vessels, there has been technological creep, which may lead to underreporting of catches given the policy of limiting the country's total catch. This can be exacerbated by social pressure. In the EU, the cornerstone of management is the system of TACs and quotas, which has led to national decisions such as the use of ITQs, which appear to be effective in removing excess fishing capacity. The Chinese system of TACs is still in its infancy and may continue to be based on input management for many years to come. Interestingly, there are some similarities between the Chinese and EU systems. Both have a social orientation, using mechanisms to compensate fishermen for temporary cessation of fishing activity, and both have also used



public funds to remove excess fleet capacity. A relevant tool used by China is the reassignment of idle fishing labour from scrapped vessels to the aquaculture and fish processing sectors. China's policy of creating employment and income opportunities through the development of a DWFF differs from the EU's approach, as China is not a signatory to one of the main international instruments, the Port State Measures to fight IUU fishing, and cannot fully guarantee sustainable fishing in distant water fishing grounds.

## References

- Ding, Q., Shan, X., Jin, X., Gorfine, H., Guan, L., & Yang, T. (2023). Evolution of China's Total Allowable Catch (TAC) system: Review and way forward. *Marine Policy*, 147, 105390.
- Government of China (2023). Development of China's Distant-Water Fisheries  
The State Council Information Office of the People's Republic of China  
October 2023. First Edition 2023.  
[http://www.scio.gov.cn/zfbps/zfbps\\_2279/202310/t20231024\\_775875.html](http://www.scio.gov.cn/zfbps/zfbps_2279/202310/t20231024_775875.html)
- Montecalvo, I., Le Billon, P., Arsenault, C., & Schvartzman, M. (2023). Ocean predators: Squids, Chinese fleets and the geopolitics of high seas fishing. *Marine Policy*, 152, 105584.
- Pauly, D., Belhabib, D., Blomeyer, R., Cheung, W. W., Cisneros-Montemayor, A. M., Copeland, D., ... & Zeller, D. (2014). China's distant-water fisheries in the 21st century. *Fish and Fisheries*, 15(3), 474-488.
- Shen, G., & Heino, M. (2014). An overview of marine fisheries management in China. *Marine Policy*, 44, 265-272.
- Yu, H., & Yu, Y. (2008). Fishing capacity management in China: Theoretic and practical perspectives. *Marine Policy*, 32(3), 351-359.
- Yu, J., & Han, Q. (2021). Exploring the management policy of distant water fisheries in China: Evolution, challenges and prospects. *Fisheries Research*, 236, 105849.
- Yu, J., Yan, T., & Ma, X. (2025). Evolution of support policies for the development of distant-water fishing bases in China: Review, performance, challenges and prospects. *Marine Policy*, 171, 106489.

## Case study 6: Norway

### Background

Norway is one of the world's leading producers of fish. According to the Directorate of Fisheries, Norwegian catches in 2019 was 2.5 million tonnes with a value of NOK 21.6 billion. The cod fishery is the most important in terms of value, but other important whitefish species include saithe, haddock and redfish. In 2023, 9 657 people who have fishing as their main occupation. In 2023, the size of the fishing fleet is estimated to be more than 5.4 thousand vessels, the majority of which are vessels up to 15 m (93.2%). The remaining categories consist of vessels between 21 and 28 m (1.8%) and over 28 m (5%). The main management authority is the Ministry of Trade, Industry and Fisheries and its Fisheries Directorate, which acts as an advisory and executive body. A variety of management measures are in place in the country, in particular those regulating TACs and Individual Vessel Quotas (IVQs), as well as inputs such as fishing licenses and technical measures.

### Fleet capacity instruments

The fishing license system is the main instrument for managing and controlling the country's fleet capacity. It is governed by the Participants Act (1999), which regulates access to ownership of vessels and participation in the exploitation of Norway's marine resources. The Marine Resources Act regulates the distribution of TACs among vessels, sets allocation limits and regulates the use of these allocations by participants (Holmeset, 2023). The TACs are distributed between the trawl fleet and the coastal fleet using the so-called 'trawl ladder', which distributed the cod TAC between trawlers and the other fishing modalities (Aasche et al., 2014). In addition, the Marine Resources Act regulates fishing methods and establishes a control system to combat IUU fishing <sup>(116)</sup>.

Since the 1930s, Norway has implemented various measures to develop its fishing fleet in order to make more intensive use of its fish resources and to provide employment for coastal communities. This was particularly the case after the Second World War, when massive public resources and subsidies were made available. Another aim was to increase efficiency through vertical integration of trawlers with land-based facilities to process cod (Standal, 2010). By the late 1960s, the decline of key fish populations made it clear that there was a problem of fleet overcapacity. The collapse of the Atlantic-Scandinavian herring stock led to the closure of the fishery and the introduction of the licensing system for the pelagic fleet in the late 1970s. By the late 1980s, there was a strong political commitment to protect the resource. At the same time, scientifically recommended TACs were adopted, and government subsidies were reduced). With optimistic predictions for the abundance of cod in the Barents Sea, new

---

<sup>(116)</sup> <https://www.fiskeridir.no/english/about-us/about-the-directorate-of-fisheries>

licenses were issued, and fleet capacity was allowed to increase in the trawl sector, including the construction of factory vessels.

However, by the end of the 1980s, the state of cod in the Barents Sea necessitated a substantial reduction in the cod TAC and a change to vessel group management. In fact, one sector of the fishery proposed the introduction of the "trawl ladder" system, which came into force in 1990. This system established rules for the distribution of the cod TAC. If the TAC is below 100,000 tonnes, the coastal fleet gets 80%. If the TAC is above 100 000 tonnes, the trawler fleet can get up to 35% for a TAC of 300 000 tonnes or more (Standal, 2010). In the late 1980s, the Ministry of Fisheries set up a committee to look at ways of improving the match between capacity and resources.

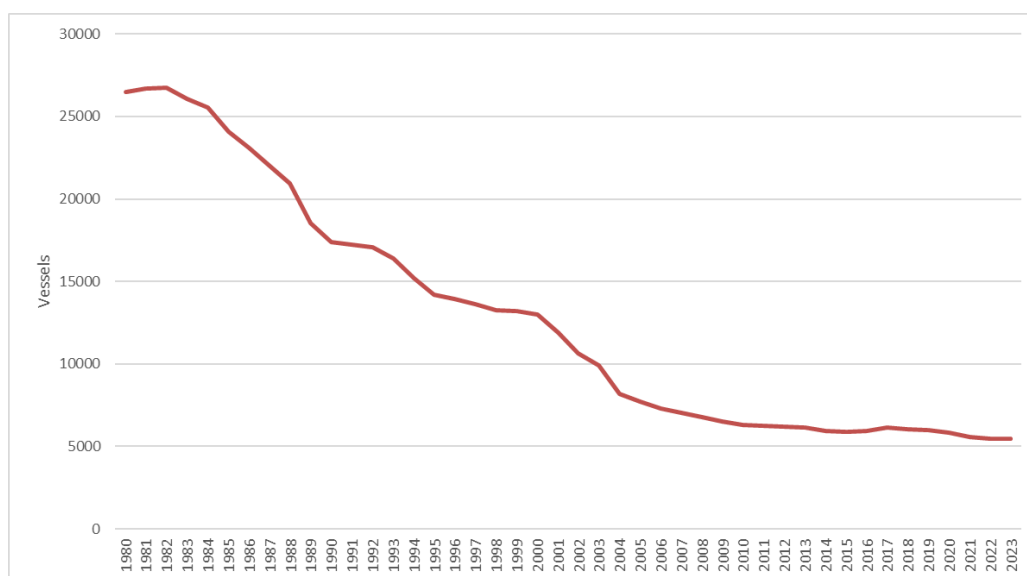
The committee found that public financial support for the fleet was no longer a viable option and that market mechanisms could provide the incentives to remove excess fleet capacity. The proposed system facilitated quota pooling between vessels in a given group. The system also took the size of the vessel into account when allocating quota. The system became the Individual Vessel Quota (IVQ). It was expected that fishermen would behave as rational actors who would have to adjust their fishing capacity (Standal, 2010). The system was introduced in 2004 for vessels over 15 metres and gradually extended to other vessel sizes. Prior to the introduction of the IVQ system, decommissioning schemes were introduced to reduce redundant capacity, resulting in a reduction of 1023 vessels by 2003 (Aasche et al. 2014). The IVQ system has a limited transferability component and quotas are not divisible. Quota exchanges are limited to groups and even geographically and vessels that transfer their quotas are scrapped.

The main objective of management innovations was to reduce the size of the fleet, and scrapping was financed by a fee paid by the sector and by public funds (Standal, 2010). The system was also limited in terms of the duration of the rights, i.e. 13 years (Hersoug et al. 2007). An important change occurred in 2005, when so-called structural quotas were introduced in the trawler fleet. This meant that ownership of rights became permanent. A percentage reduction was applied when quotas were made permanent and distributed within the trawl fleet. The impact of the new system has been significant in terms of fleet reduction. For example, the number of cod trawlers was reduced from 95 to 43 between 2005 and 2020. The system was also implemented in the purse seine and longline fleets with similar effects. In 2006, political changes in the country led to the withdrawal of permanent rights, which were then only granted for 25 years to vessels that had already benefited from the structural quotas. For new transactions, the duration of the rights is 20 years (Standal and Hersoug, 2015).

## Outcomes of the interventions

Data from Stat bank Norway <sup>(117)</sup> and the Directorate of Fisheries (Fiskeridirektoratet, 2024) show that the fleet has decreased significantly from 26 504 vessels in 1980 to 5 478 vessels in 2023 (see Figure 46). The number of fishers will also decrease from 34 789 to 10 833 in 2023. It appears that the impact on fleet capacity and employment has been significant due to the introduction of the IVQ system and complementary incentives such as the increase in the duration of rights. It is also important to mention the compulsory scrapping of vessel transfer rights. Thus, idle capacity was eliminated and the possibility of idle vessels returning to the fishery or spilling over to other vessels was eliminated. Zhang et al. (2018) note that catches have not declined to the same extent, i.e. the decline in catches between 1983 and 2015 was 17%. This may indicate an improvement in productivity. In turn, the income of the fishing fleet has increased from around SEK 3 million in 1980 to SEK 28 million in 2023 (Fiskeridirektoratet, 2024).

**Figure 46 – Fleet size evolution in Norway in number of vessels**



*Data source:* Stat bank Norway and Fiskeridirektoratet

## Applicability in the EU context

This case study shows that the IVQ system was introduced to address urgent problems such as the accumulation of capacity in the various fishing fleets. It is worth noting that this capacity was the result of different policies that, until the 1980s, sought to guarantee employment and economic objectives. Later, the need to conserve stocks led to the introduction of science-based fisheries management. Government intervention was needed to remove unused capacity

<sup>(117)</sup> <https://www.ssb.no/en/statbank>

and to set entry/exit rules, although since the late 1990s the industry has shared the cost of permanently removing excess capacity. The IVQ system led to a profound change in fleet structure and improved productivity, although the social costs appear to have been high.

There are a number of parallels with the EU's experience in managing fleet capacity. First, market-based mechanisms have been used in several Member States, also with limited transferability. The model of quota strictly linked to the vessel, with no possibility of divisibility of the quota allocated to the vessel, has not, as far as we are aware, been used in any EU Member State. The Norwegian system also has a limited duration. Quotas in Norway have limited transferability and can only be transferred within a group. In the EU, for example, France is more restrictive, and no transfers are allowed. The Spanish ITQs are similar in the sense that quota transfers are allowed within a given fleet census, although quotas are divisible. Similarly, in the Norwegian case, public support has been instrumental in addressing capacity problems. The main difference between the Norwegian model and EU model is the abolition of public support for scrapping idle capacity and the limited duration of quota transactions. In the EU, aid for permanent cessation of fishing activity is one of the main elements for reducing excess capacity. In the latter case, permanent quotas may have encouraged quota exchanges and the elimination of fleet overcapacity, while at the same time increasing efficiency.

## References

- Asche, F., Bjørndal, M. T., & Bjørndal, T. (2014). Development in fleet fishing capacity in rights based fisheries. *Marine Policy*, 44, 166-171.
- Fiskeridirektoratet (2024). Economic and biological figures from the Norwegian fisheries 2024. P.35.
- Hersoug, B., Holm, P., & Rånes, S. A. (2000). The missing T. Path dependency within an individual vessel quota system—the case of Norwegian cod fisheries. *Marine Policy*, 24(4), 319-330.
- Holmeset, T. Fisheries in Norway and Iceland: A comparative study. Thesis for the degree of Master of Science in Aquatic food production. University of Iceland.
- Standal, D. (2010). Unlocking the concept of capacity in modern fisheries management. PhD. Dissertation. Norwegian University of Life Sciences.
- Standal, D., & Hersoug, B. (2015). Shaping technology, building society; the industrialization of the Norwegian cod fisheries. *Marine Policy*, 51, 66-74.
- Zhang, D., Sikveland, M., & Hermansen, Ø. (2018). Fishing fleet capacity and profitability. *Marine policy*, 88, 116-121.

## Case study 7: United Kingdom

### Background

The UK is one of the leading producers of fish in Europe. In 2023, UK vessels landed 719 tonnes of fish, of which 62% were pelagic species such as blue whiting, herring and mackerel, 20% were demersal species such as cod, haddock and monkfish, and 18% were shellfish such as edible crabs, Nephrops and king scallops. According to the House of Commons (2022), the fishing sector represented 0.03% of the UK's economic output in 2021 and employed 10 724 people. The size of the fishing fleet was estimated to be 5,783 vessels, 79% of which were boats measuring less than 10 metres in length. However, these vessels harvested only 5% of the total landings; the remainder were caught by larger boats.

UK fisheries were subject to the EU's Common Fisheries Policy (CFP) from its inception in 1983 until 2021. The UK adopted a fisheries management system based on TACs, relying on scientific advice from ICES and aiming to achieve MSY. Management measures included fishing effort restrictions, technical measures, such as fishing gear selectivity, catch limits, and management plans (Reeves et al., 2008). Following its departure from the EU, the UK became an independent coastal state. The Fisheries Act, passed in late 2020, became the UK's primary fishing regulation <sup>(118)</sup>. The Act aims to enable full control and legal responsibility for fishing, and to establish a fisheries management framework (Kemp et al., 2023). It sets out the principles for determining exploitation rates for UK fish stocks, negotiating management measures for shared stocks, and granting access to UK waters for non-UK fishing vessels. It also sets out duties to develop Fisheries Management Plans to maintain stocks at or above the Maximum Sustainable Yield (MSY) or to restore them to levels capable of producing MSY. For shared stocks, which represent the majority of stocks managed through catch limits, the UK will negotiate bilateral and multilateral agreements directly, as it did with the EU and Norway (Guille et al., 2021; Kemp et al., 2023).

### Fleet capacity instruments

The management of fleet capacity in the UK was affected by the CFP's general framework for fleet capacity management. These aspects are described in detail in Section 3. Nevertheless, like any other Member State, the UK had the autonomy to implement management measures in its fleets and full discretion over the distribution of fishing opportunities among its vessels. For the three decades prior to Brexit, fleet capacity management was handled through rights-based management, decommissioning schemes and entry/exit rules.

---

<sup>(118)</sup> UK Government (2020a). Flagship Fisheries Bill becomes law.

<https://www.gov.uk/government/news/flagship-fisheries-bill-becomes-law>



Decommissioning schemes were reportedly in place from the early 1990s until 2011 (Anon., 2021). Entry/exit rules have been in place since the mid-1990s, when the licensing system was introduced and capacity was capped (Reeves, 2018; Anonymous, 2021). As additional capacity was not permitted, an entry/exit rule was in place even before the EU's entry/exit rule and capacity ceilings were introduced in 2003. A system was put in place to address situations where there was a lapse between the decommissioning of vessels and the entry of new capacity. These licenses, also known as “dummy licenses”, provided flexibility as they could be used for permanent or temporary transfers and aggregations within three years of the scrapped vessel being removed from the official register (MRAG, 2009; Anon., 2021).

Since the inception of the CFP, POs have played a key role in managing the allocations of their members' vessels measuring over 10 metres. Vessels measuring over 10 metres that are not members of POs (also known as 'the non-sector') are also allocated a share of the national quota. At the heart of the UK's rights-based management system lies the Fixed Quota Allocation (FQA). These rights were initially defined based on the track fishing records of the previous three years, also known as the 'rolling period'. This created an incentive to change fishing patterns during the rolling period in order to qualify for a larger share of the subsequent year's allocation. This resulted in the implementation of three-year fixed reference periods (MRAG et al., 2000). POs can decide whether to pool the rights of their members or manage them individually. Vessels below 10 metres are not allocated an FQA, but they have access to a share of the national quotas for a given species. POs can exchange quotas with each other, and quota trades are possible within a PO. No permanent adjustments to a vessel's FQA are permitted (Reeves, 2018). The Fisheries Act (2020)<sup>119</sup> was enacted to establish a framework for the management of UK's fisheries as an independent coastal state. Fisheries Management Plans (FMPs) are key instruments of the Act in pursuit of sustainability goals. With regard to fleet capacity management, a FMP (2024) has established restrictions on the engine power of vessels (221 Kw and over) using flyseining gear in the territorial waters of the Channel Sea. The goal is to manage fishing effort on demersal non-quota species in inshore waters.

## **Outcomes of the interventions**

The development of the UK's fleet capacity followed a similar pattern to that in other EU countries. The fleet expanded after the Second World War due to stock levels and technological innovations. In terms of power, fleet capacity peaked in the early 1970s, but stocks were already showing signs of decline. The Cod War with Iceland and the subsequent loss of fishing opportunities also negatively impacted fleet performance (Kemp et al., 2023). Like many other EU Member

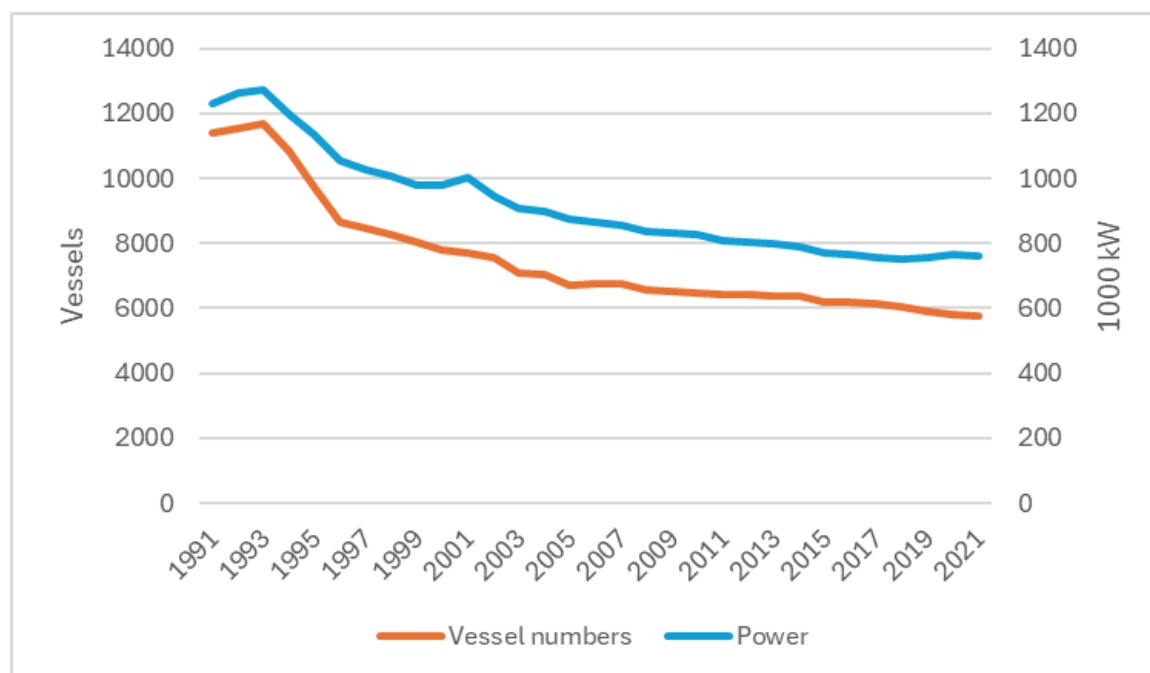
---

(<sup>119</sup>) <https://www.gov.uk/government/publications/fisheries-management-plans/fisheries-management-plans>



States, the UK's fleet capacity has decreased over the years. Since 1991, the fleet has shrunk by around 50% in terms of vessels and by 38% in terms of power in kW (Figure 47). This may be the result of incentives provided by rights-based management and decommissioning schemes, as well as structural fisheries funds, when the UK was an EU Member State (see Section 2 in this report).

**Figure 47 – Evolution of the UK fleet capacity in terms of vessels and power**



*Data source:* Marine Management Authority

### Applicability in the EU context

The UK was part of the EU for many years, during which time management measures implemented for Member States were adopted in UK fisheries, as well as support from the EMFF. It seems that entry/exit schemes have been instrumental in deterring the expansion of the fleet and ensuring the sustainable exploitation of resources. Rights-based management with restricted transferability, as in the UK model, has also been in place in the EU and in different Member States, such as Spain. The role of POs is also similar to that in France and Spain. One innovation is the use of virtual entitlements or “dummy licenses” to bridge the gap between the scrapping of a vessel and the entry of a new one. This system could be used as a benchmark by Member States as it would allow virtual licenses to remain in the system, either for use in newly crafted vessels or to permit the entry of larger vessels due to improved habitability conditions or the use of more efficient alternative propulsion systems.

### References

Anon. (2021). UK fleet capacity report. [https://oceans-and-fisheries.ec.europa.eu/system/files/2021-09/2020-fleet-capacity-report-uk\\_en.pdf](https://oceans-and-fisheries.ec.europa.eu/system/files/2021-09/2020-fleet-capacity-report-uk_en.pdf)

- Guille, H., C. Gilmour, & E. Willsteed (2021). UK Fisheries Audit. Report produced by Macalister Elliott and Partners Ltd. for Oceana. Lymington, UK. 116 pp
- House of the Commons (2022). UK fisheries statistics.
- Kemp, P. S., Subbiah, G., Barnes, R., Boerder, K., O'Leary, B. C., Stewart, B. D., & Williams, C. (2023). The future of marine fisheries management and conservation in the United Kingdom: Lessons learnt from over 100 years of biased policy. *Marine Policy*, 147, 105075.
- MRAG, I. F. M., CEFAS, A., & Tecnalia, P. (2009). An analysis of existing Rights Based Management (RBM) instruments in Member States and on setting up best practices in the EU. Final Report, London, MRAG Ltd.
- Reeves, S.A., Revill, A.S., Hutton, T.P. & Pinnegar, J.K. (2008) Technical Measures in the CFP and the reform of Council Regulation 850/98. Directorate General for Internal Policies of the Union, Policy Department B: Structural and Cohesion Policies, Study IP/B/PECH/IC/2007/090 Available at: [http://www.europarl.europa.eu/RegData/etudes/etudes/join/2008/408930/IPOLPECH\\_ET\(2008\)408930\\_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/etudes/join/2008/408930/IPOLPECH_ET(2008)408930_EN.pdf)
- Reeves, S. A., Bell, J. B., Davie, L., Dolder, P., Hyder, K., Pontalier, H., & Vaughan, D. (2018). A review of international fisheries management regimes. Cefas contract report C7372

## Annex 4: Link between fishing capacity metrics and harvesting capacity

This section explores the need for further studies that would research to investigate the relationship between fishing capacity and harvesting capacity. If a strong correlation is found, alternative methods for calculating fishing capacity, beyond those based solely on GT or kW, can be explored. These alternatives would help manage vessel modernisation while ensuring harvesting capacity remains under control. Specifically, such a metric would aim to:

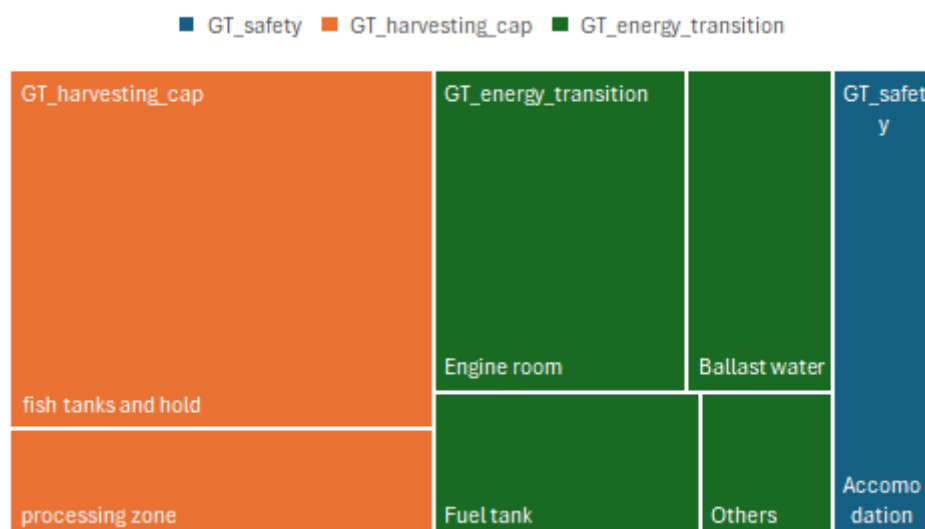
- Separate the vessel's propulsion power and fishing power.

The vessel's kW typically refers to propulsion power, but additional power is often used to operate fishing gear, effectively increasing the “ability to catch fish” (e.g. larger nets, faster towing, larger geographical range). Fishing gears typically operate by using hydraulic or electric pumps, electric power, etc. Depending on the size of the vessel, such pumps can be powered with auxiliary engines or directly assembled to the main engine with belts. In small-scale or artisanal vessels, there might not be any auxiliary engine, or it could be relatively small. However, in bigger vessels, the auxiliary power, in part used to move the fishing gears, may be considerable (see percentages in Section 7). Therefore, the auxiliary power may also give an approximate idea of the size of the fishing gear, in some specific fishing sectors.

- Separate the vessel's GT components contributing to fishing power.

Gross tonnage includes all enclosed spaces, but not all of these relate to fishing power. For example, space used for fuel tanks, refrigeration systems and gear storage (including number of nets and length of warps) contributes directly to fishing power, whereas the superstructure, ballast water or bulbous bows do not (Figure 48). Depending on the type of fishing vessel, the structure and relation between dimensions can change considerably (Thermes et al., 2023).

A trawler studied by Aalbers (2018) showed that the share of the total [GT\_safety] of the vessels could be: 13% for accommodation, 12% for fish processing, 39% for fish tanks/ holds, 10% for tanks (e.g. fuel, ballast water) and 21% for the engine room, with 5% unspecified. These figures highlight the need to better assess how increases in specific GT components (e.g. holds or tanks) impact fishing capacity.

**Figure 48 – An illustrative treemap showing the split of vessel GT into subcomponents**

- Identify unaccounted factors that increase “ability to catch fish”.  
Equipment such as fish-finding devices, advanced electronic equipment, high speed winches can significantly increase the vessel’s harvesting capacity. These elements are often overlooked in traditional capacity measurements but should be included in a more comprehensive approach.
- A strategy to accommodate the vessel modernisation challenges.  
To define fishing capacity metrics independent of the harvesting capacity, would allow vessels to increase kW or GT to improve safety and crew comfort on board when facing frequent rough sea conditions or installing larger, heavier engines to decarbonise the vessel (given more space is needed for new and alternative fuels and energy power sources) without increasing the “ability to catch fish”.

A study on such aspects would underline the precautions that should be taken in such endeavours. As mentioned, there is a precedent in Spain where fishing vessels were allowed increase their GT for safety reasons, which unexpectedly resulted in the installation of larger superstructures on deck, ultimately reducing vessel stability.

It is also important to distinguish between the capacity reviews related to the engine power (kW) and those based on GT. In the context of the energy transition, some solutions, such as optimised hull designs, would reduce engine power requirements, leading to lower kW needs and fuel savings.

One option is to develop additional metrics related to gear type in use. These metrics would consider fishing gear characteristics that would either correlate or be unrelated to GT and kW measurements. GT and kW may only be loosely correlated to the vessel’s actual “ability to catch fish”. In contrast, differences in gear characteristics, (such as mesh size, geometry, overall size, “fishing circle or

opening", fish herding effects of trawl warps, bridles and doors), are more likely to be related to fishing capacity, especially for trawlers. Other factors that determine the towing force of a vessel, such as the vessel's propeller diameter and the shape of the hull, also play a role.

This highlights the need to redefine how fishing capacity is measured, in order to more accurately reflect differences in harvesting capacity. This would involve for example, using complementary metrics rather than a complete replacement of existing definitions.

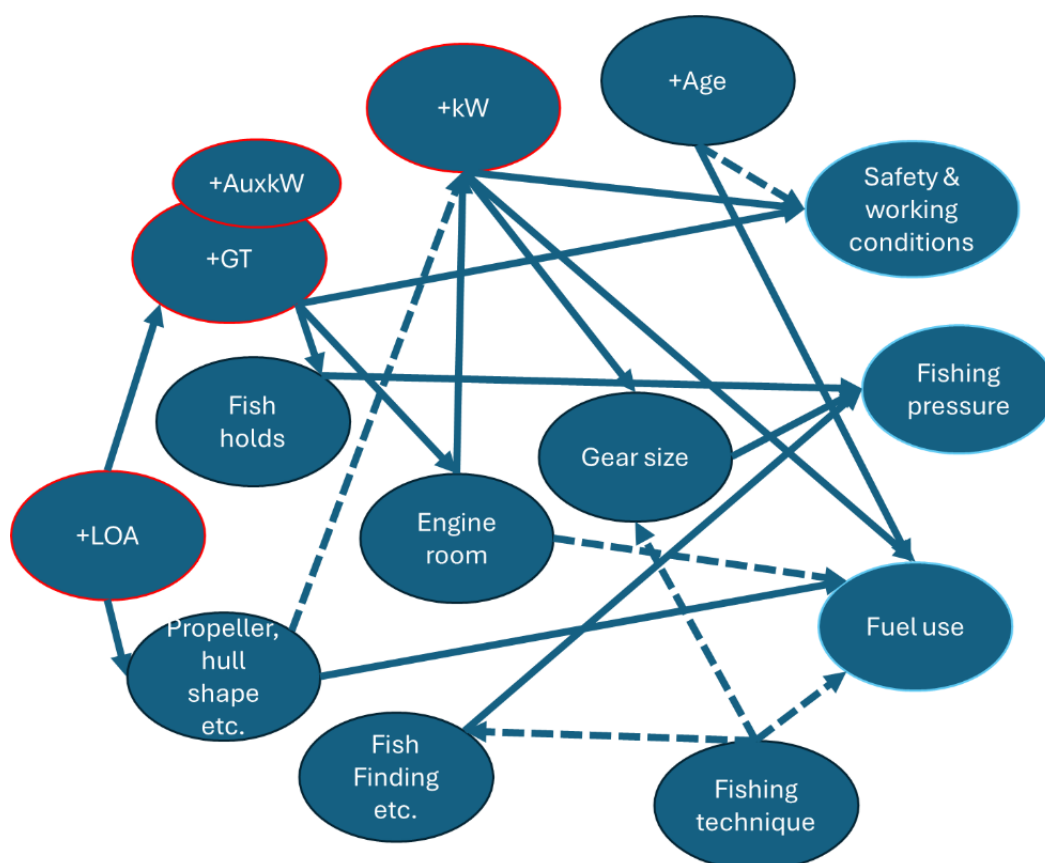
The fishing industry sector argues it is constrained by current metrics. For instance, GT-based limits can lead to trade-offs between safety and fish hold volume (see further below), potentially compromising safety. Similarly, vessel length thresholds can create incentives for abnormal hull shapes to stay within a specific vessel regulatory category. However, it should be recognised that such threshold effects on LOA will always be present if taxes are related to vessel length. Moreover, reshaping the hull to improve hydrodynamics may reduce engine power, thus reducing engine fuel. A shift in taxation or regulation linked to the installed kW might reduce these distortions. Any control procedure should clearly define how fishing capacity can be increased without increasing the gear size and, as a result, the fishing mortality (F) (if gear size is related to F).

Some research is needed that would use statistical modelling approaches and instrumental variables in causal graphs (see Figure 49 below) to distinguish the effects of various vessel characteristics on fishing capacity. For example:

- Larger kW -> larger gear size/reduced time to reach grounds/more trips -> larger F per kW -> better safety; or
- Larger GT -> larger ballasts/deck cranes/deck space/better vessel stability/safety/accommodation -> larger fish holds/winches/power-block/net drums/RSW -> larger F per GT -> more room for decarbonisation; or
- Larger LOA/optimised hull shape -> less water resistance to vessel displacement -> less kW -> less fuel use.

However, it is likely only possible to add kW without affecting F only if the relationship is found to be asymptotic (i.e. gains in F diminish at high engine power levels, see Kraak et al. 2013; Eigaard et al. 2016), or if a vessel switches to using a different fishing technique not directly linked to the vessel power, such as with passive gears. Switching to a more efficient fishing technique, such as using the Best Available Technique (BAT) (e.g. Bastardie et al. 2022) to minimise environmental impact, may improve fishing efficiency (e.g. in cases where trawlers are converted to seiners).

**Figure 49 – Draft of mapping the possible interactions/relationships (positive feedback in solid link, negative feedback in dashed link) between an increase in fleet capacity (+LOA, +GT, +kW, +auxkW, highlighted in red as the ones managed by the fleet policy) or ageing (+Age), the resulting fishing capacity, and the risk for imbalance (i.e. +fishing pressure), or opportunities for safety improvements, and fuel use reduction. As there is the presence of contradictory effects (e.g. a larger engine room can fit zero-carbon motors, or increase the kW), the net outcome is uncertain.**



The strength of the link between GT/kW and the “ability to catch fish” may change considerably from one fleet segment to another. In some cases, vessels may operate with gear smaller than what their potential capacity could use, due to constraints such as fuel costs. If those constraints are removed, gear size thus affecting vessel efficiency could increase even without any changes to GT or kW.

Until now, very little attention has been paid to the possible de-correlation between the GT and kW and actual fishing capacity. In some cases, the construction of smaller vessels has been proposed as a solution for overexploitation and to promote sustainability of specific fisheries (Tsitsika et al. 2008).

However, increasing GT does not always increase fishing capacity. For example, a purse seiner whose capacity increases from 300 GT to 500 GT, while maintaining the same fishing gear and fishing load capacity, might benefit from an increase in comfort and safety onboard without increasing its fishing capacity. Similarly, for the decarbonization technologies, such as hybrid propulsion

systems, need additional space onboard (see Section 6), which may not be used for fishing operations. On the other hand, it should be recognized that installed engine power (kW), may in some cases, be much larger than the actual power needed for fishing operations, a situation called “overpowering”.

One way to measure the fishing capacity of a vessel is through its fish hold volume (FHV). However, FHV values are not always available from public records. Therefore, it is useful to explore the relationship between FHV and other readily available metrics to estimate it (Annex 5). Another related metric is the Fishing Carrying Capacity volume (FCC), which can be defined as the maximum observed landing amount of a given vessel. This metric, however, requires access to landing data, such as logbook entries. In the absence of logbooks, the LOA provides a good proxy for estimating the fish-carrying capacity of a vessel.

There is also potential to decouple the current regulation on GT from the regulation on kW, by identifying possible innovative tonnage calculations. For example, allowing lengthening the vessels could enable hull designs that improve hydrodynamics and provide more living space. These longer, modified hulls may reduce water resistance <sup>(120)</sup>, thereby decreasing the engine power (and fuel) required for propulsion.

The study should recognize that there may be an incentive to increase a vessel's "ability to catch fish". Nevertheless, any effort to improve the economic efficiency of the fishing fleet while minimising the impact on the seafloor and bycatch, should be guided by the application of BAT. These techniques can help to ensure that increases in fishing efficiencies do not inadvertently raise fishing mortality beyond the intended levels.

Ideally, efforts in vessel modernisation, such as improvements in safety, comfort, or decarbonisation, should not be treated in the same way as changes aimed at increasing fishing capacity. However, any redefinition of fishing capacity should remain consistent with the objectives of the CFP. For example, while allowing increases in GT might lead to larger fish hold volumes, this should not contradict sustainability objectives. In this context, legislation such as the Landing Obligation (LO), might lead operators to use additional space to store unmarketable catch, and thereby incentivising capacity increases. Instead, the LO should function as a driver for changes in behaviour and increase selectivity to encourage gear modifications and fishing practices that avoid catching unmarketable fish in the first instance.

---

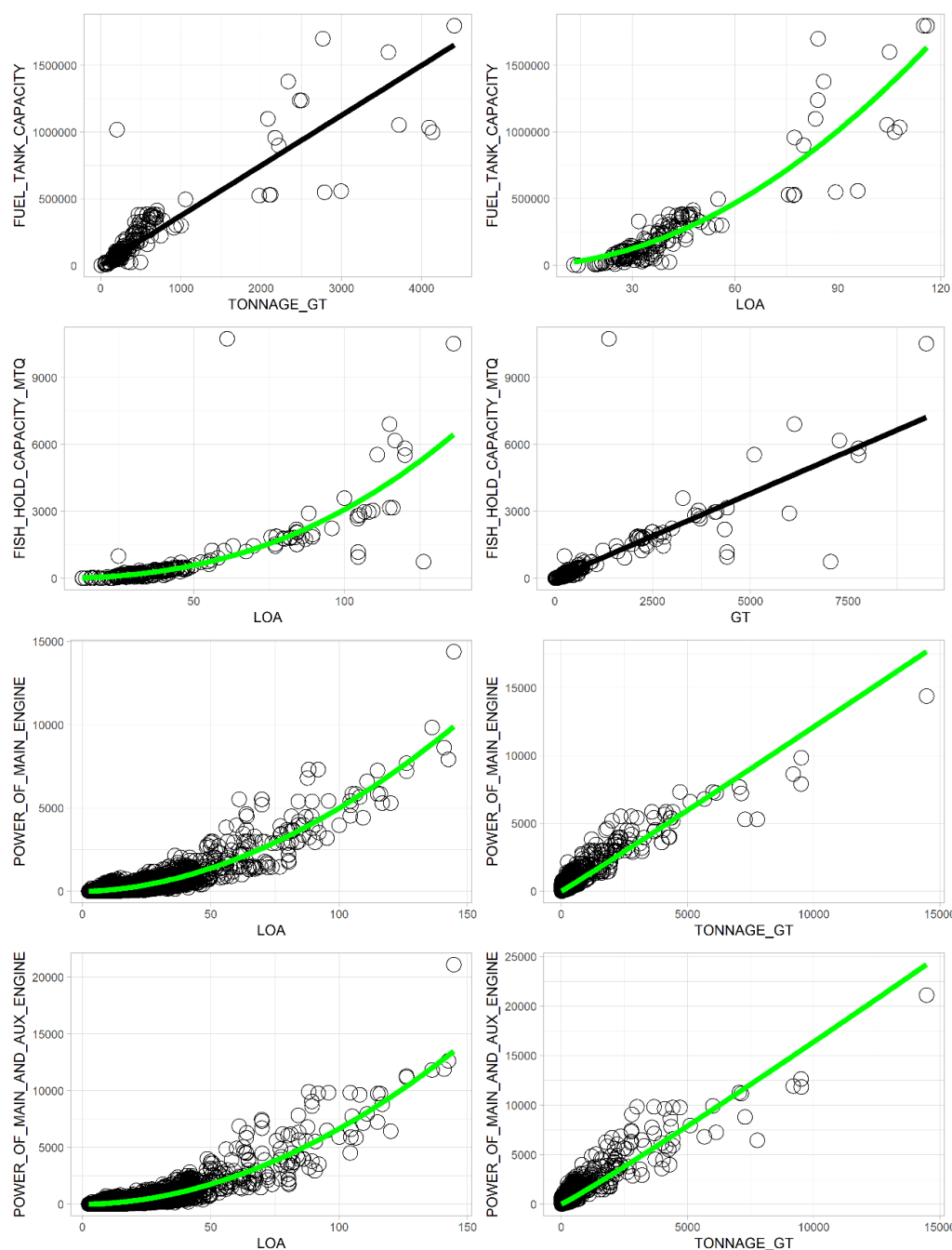
<sup>(120)</sup> See for example, so called “iso-fishing” vessels.



## Annex 5: Relationships with vessel physical characteristics to complement current GT and kW capacity metrics

The analysis of vessel's characteristics recorded in the EU Fleet Register (in its extended version reporting more details for vessels active outside EU waters), highlights some relationships between those characteristics and the capacity metrics currently managed under the fleet policy (Figure 50).

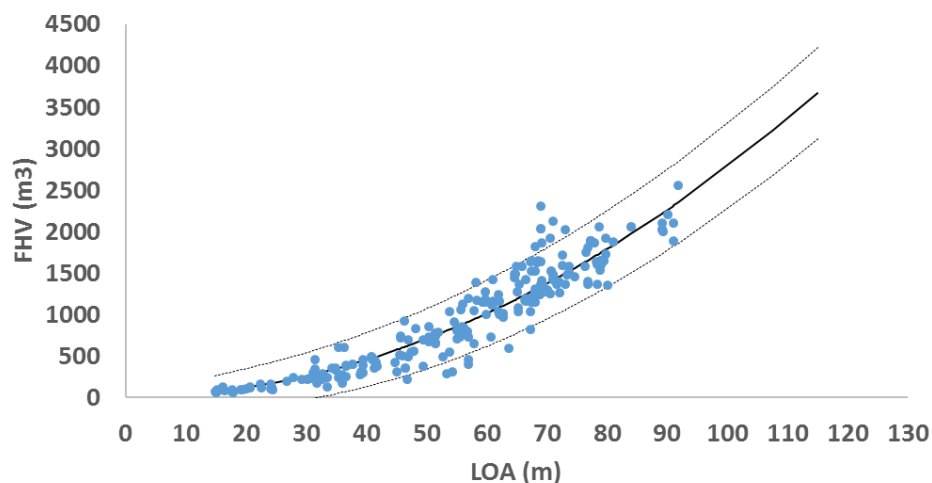
**Figure 50 – Fitted models relationships obtained from analysing the Extended EU Fleet Register records. Outliers likely correspond to recording errors (including entering values in different units, etc.). Black line: simple linear models, Green line: power models**



These relationships with the fish hold capacity (as a proxy of the “ability to catch fish”) show that a power law is the best fit for most in case of the LOA, compared to a proportional increase, making the volume and fish hold capacity increasing rate more pronounced alongside with longer vessel (LOA). Instead, such increase

in capacity (that link to the “ability to catch fish”) is found proportional with **the GT** (Figure 51).

**Figure 51 – A relationship between fish hold volume (FHV) and LOA for surveyed Spanish purse seiners for tuna listed at the IATTC records (n=259) as reported in Restrepo and Justel-Rubio 2016 - ISSF Technical Report 2016-10**



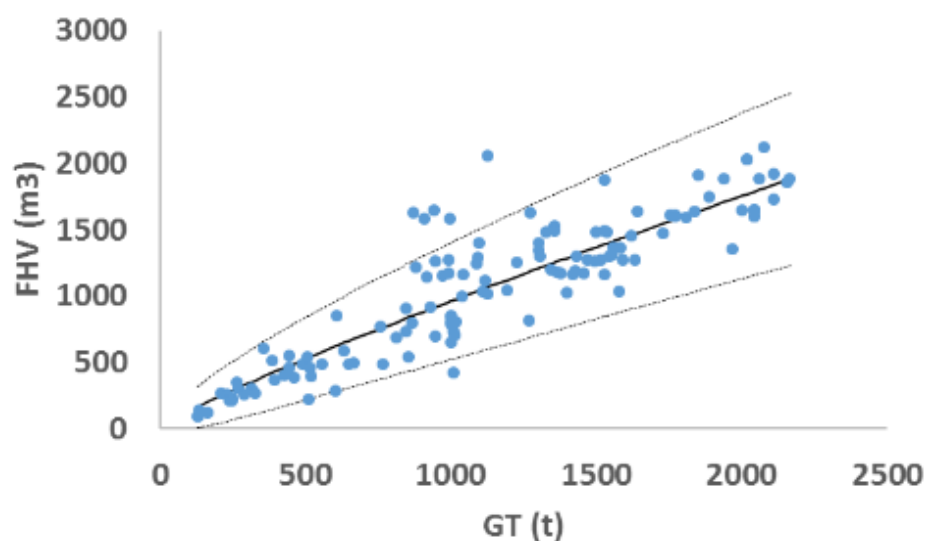
Where FHV (m³) as a function of LOA (L, in metres):

$$h_i = aL_i^b \text{ with } \sigma_i^2 = \sigma^2 L_i$$

With estimates on n=259 vessels given a=0.3043, b=1.9806, sigma=688.1274

A similar relationship has been shown between fish hold volume (FHV) and GT for surveyed Spanish purse seiners for tuna listed at the IATTC (Figure 52).

**Figure 52 – A relationship between fish hold volume (FHV) and GT for surveyed Spanish purse seiners for tuna listed at the IATTC records (n=148) as reported in Restrepo and Justel-Rubio 2016 -ISSF Technical Report 2016-10.**



## Annex 6: The Irish case around the request to increase GT on safety grounds

The case concerned a request to annul a decision made by the Commission (Commission Decision 2003/245/EC) which rejected a request from a number of claimants to increase the capacity of their vessels due to improvements made to vessel safety, navigation at sea, hygiene, product quality and general working conditions. The legal context behind this was based on their application of the Article 4(2) of Decision 97/413/EC of June 1997.

The process for undertaking this was outlined in Article 6 of Regulation (EC) 2792/1999, which defined the rules for applying for Community structural assistance, not just for vessel improvements but also through replacing old vessels with newer ones. Vessel exchanges could be approved, provided the Member State could:

*‘...demonstrate that entries and exits from the fleet will be managed in such a way that the capacity does not exceed the annual objectives fixed in the multiannual guidance programme, overall and for the segments concerned, or where appropriate that fishing capacity is gradually reduced to attain these objectives.’*

It also defined more clearly the scope of adjustments that would be allowed:

*‘Member States can submit a request for a clearly identified and quantified increase in the capacity objectives for measures to improve safety, navigation at sea, hygiene, product quality and working conditions provided that these measures do not result in an increase in the exploitation rate of the resources concerned.’*

The process for this has also been previously outlined in Paragraph 3.3 (*‘Authorised adjustments to the objectives’*) of the Annex to the Commission Decision 98/125 *‘Member States may at any time submit to the Commission a programme of safety improvements. In accordance with Articles 3 and 4 of Decision 97/413/EC the Commission will decide whether any capacity increase foreseen by such a programme justifies a corresponding increase in the objectives of the MAGP IV. Where a Member State implements technical measures that result in a reduction in the by-catch of critical stocks, the Commission will, at the request of that Member State, determine whether these measures justify a revision of the weighted reduction rates applicable to the segments or fisheries concerned. The Decisions of the Commission*

*concerning the provisions of this paragraph will be taken according to the procedures of Article 18 of Regulation (EEC) No 3760/92.'*

This is particularly relevant as this Decision provided the multiannual guidance specifically for Ireland over the period of time covered by Decision 97/413/EC.

The case of Boyle and others V the Commission concerns an appeal made by a number of Irish vessel owners against a decision made by the Commission rejecting their claims for 28 vessels. The names of the rejected vessels are given in Commission Decision 2003/245/EC, along with the names of vessels whose claims had been accepted. Other Member States had also applied, namely Belgium, the Netherlands, Sweden and the UK, all of whom had claims rejected but it is unclear if these were also contested.

The criteria for eligibility were defined in Article 1 of the Decision 2003/245/EC:

- 1. the requests have been forwarded on case-by-case basis by the Member State before 31 December 2001;*
- 2. the vessel must be properly registered in the Fleet Register of the Community;*
- 3. the vessel concerned has an overall length of 15 m or more;*
- 4. the increase in tonnage is the result of modernisation works over the main deck performed or to be performed on an existing registered vessel at least five years old on the starting date of the works. In the case where a vessel has been lost at sea, the increase in tonnage is the result of a greater volume over the main deck of the replacement vessel with respect to the vessel that was lost;*
- 5. the increase in tonnage is justified in order to improve safety, navigation at sea, hygiene, product quality and working conditions;*
- 6. the volume under the main deck of the modified vessel or the replacement vessel is not increased.*

The main area of contest is that most of these criteria were not in the original Decisions. For example, by requiring them to be registered, criteria 2 would effectively stop any new vessels entering in the fleet as being new they would not have been able to do this and criteria 4 and 6 require any modifications to be done above deck and on vessels at least 5 years old.

While what does constitute an acceptable adjustment is not defined, the Commission did go on to state in the judgement what would not be acceptable, even with the same tonnage and power:

- *the use of electronic equipment to find fish and to control precisely trawl depth and speed;*
- *the increased efficiency in the use of fuel;*
- *the increased efficiency of the propeller and the improvement of the hydrodynamic performance of the net, allowing the vessel to trawl a bigger net with the same engine power;*
- *the use of more powerful deck equipment, making it possible to haul the net more times per day (on the larger vessels the deck equipment is operated by auxiliary engines which are not taken into account when calculating the power of the vessel);*
- *the use of mechanised systems for deploying long lines, allowing more hooks to be deployed and recovered at the same time.*

With regards to the criteria that any works must be above deck the Commission:

*'...observed that according to Archimedes' principle, the weight carried by the vessel is equal to the amount of water displaced by the submerged part of the hull. Any increase in the size of the hull inevitably increases the quantity of water displaced and therefore the weight which the vessel can carry. Thus, increasing the size of the hull corresponds to an increase in the size of the vessel and therefore in the fishing effort.'*

This was incorrect as any increase in size and subsequent weight above deck would also lead to a greater displacement and the Court annulled Decision 2003/245/EC.

## Annex 7: The gross tonnage for safety (GT\_safety) declaration in the EU Fleet Register

The EU Fleet Registry contains information on all vessels flying the flag of an EU country and is based on submissions from Member States from their own fleet registries. Member States must inform the EU of any changes to the status of a vessel, for example if a vessel has been scrapped or modified. As of September 2024, the registry contained details of 69,278 vessels, including information on the GT as well as their Gross Safety Tonnage (GT\_safety), if it has one. GT\_safety is defined under the Commission Implementing Regulation (EU) 2017/218 as '*In GT, an increase in tonnage permitted on grounds of safety (historical data)*'. Currently there are only 242 vessels (<0.5% of the total number of vessels on the registry) with registered GT\_safety, the majority of these belong to Spain (62%), Poland (20%) and France (7%), the remaining vessels (11%) split between eight countries. Table 56 gives a breakdown of number of vessels and total GT\_safety by country and primary gear type.

**Table 56 – Vessels with a registered gross safety tonnage (GT\_safety) by country and primary gear type. Numbers of vessels and actual total GT\_safety in parenthesis**

| Country     | GNS         | LL          | LLS         | OTB           | OTM         | PS          | PT        | TBB      | Total         |
|-------------|-------------|-------------|-------------|---------------|-------------|-------------|-----------|----------|---------------|
| Spain       | 17<br>(457) | 28<br>(820) | 18<br>(639) | 56<br>(977)   |             | 31<br>(497) | 1<br>(7)  |          | 151<br>(3397) |
| Poland      | 2<br>(44)   | 1<br>(32)   |             | 35<br>(750)   | 12<br>(302) |             |           |          | 50<br>(1128)  |
| France      | 7<br>(243)  |             | 6<br>(279)  | 2<br>(55)     |             |             | 1<br>(3)  |          | 16<br>(580)   |
| Sweden      |             |             |             | 4<br>(61)     | 2<br>(18)   |             |           |          | 6<br>(79)     |
| Ireland     | 1<br>(22)   |             |             | 3<br>(83)     | 1<br>(11)   |             |           |          | 5<br>(116)    |
| Portugal    | 2<br>(26)   |             | 1<br>(54)   | 1<br>(24)     |             |             |           |          | 4<br>(104)    |
| Greece      |             |             |             | 2<br>(14)     |             | 1<br>(2)    |           |          | 3<br>(16)     |
| Italy       |             |             |             | 1<br>(16)     |             | 2<br>(17)   |           |          | 3<br>(33)     |
| Germany     |             |             |             | 1<br>(1308)   |             |             |           | 1<br>(2) | 2<br>(1310)   |
| Croatia     |             |             |             | 1<br>(23)     |             |             |           |          | 1<br>(23)     |
| Netherlands |             |             |             |               |             |             |           | 1<br>(4) | 1<br>(4)      |
| Total       | 29<br>(792) | 29<br>(852) | 25<br>(972) | 106<br>(3311) | 15<br>(331) | 34<br>(516) | 2<br>(10) | 2<br>(6) | 242<br>(6790) |

**GNS** – Fixed gill nets, **LL** – Drifting longlines and hand lines, **LLS** – Set longlines, **OTB** – Bottom otter trawl, **PS** – Purse seine, **PT** – Pair trawling (bottom and mid-water), **TBB** – Beam trawl

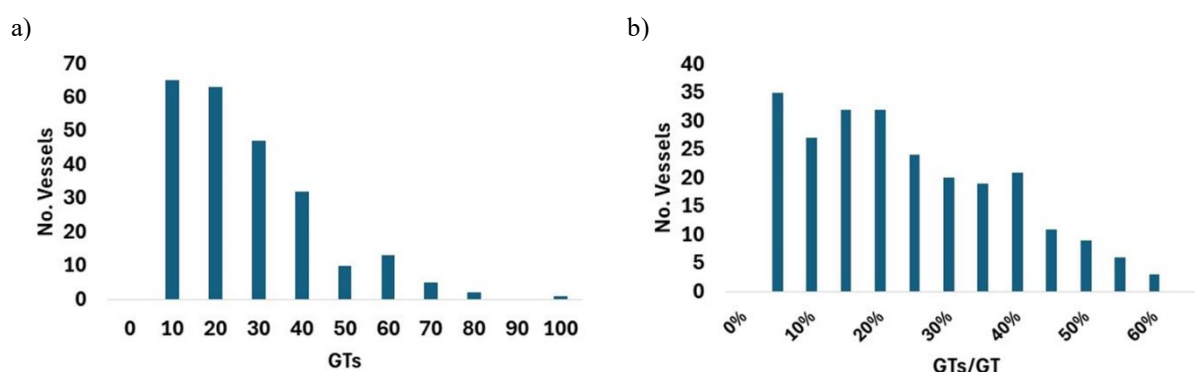
Source: EU Fleet Registry (accessed September 2024)



The individual GT\_s ranged from 0.3 tonnes to 1,308 tonnes representing between <0.5% up to 60% of the GT of the vessel (Figure 53) or, using the parameters defined in the Spanish Royal Decree **RD 2887/1998, increases between 1.003 and 1.605 of the vessel's GT. Of note in Table 56 is the single bottom otter trawl vessel flagged to Germany, the *Berlin***. This is one of the most recent vessels to enter the fleet and was first registered on 27<sup>th</sup> February 2024. It replaced the *Baldvin NC*, an older vessel built in 1992. Both are stern trawlers. However, the *Berlin* is larger with a GT of 4,345 compared to 1,906 for the *Baldvin NC* and is capable of towing three nets at any one time, a probable increase in fishing capacity compared to the vessel it replaced. At 1,308 it has the largest GT\_safety of any vessel on the registry with the next vessel down having only 167 and the remainder being below 100 (Figure 53a). It is the only vessel to have recorded a GT\_safety in nearly 10 years, the last one being in August 2015 so it cannot be classed as 'historical'. It is unclear why the GT\_safety is so high and is likely to be a recording error. However the vessel is newly built with the latest technology on board, there is a focus on 'quality of catch, safety of crew and sustainable operations' with enhanced living conditions, larger cabins, a lounge and a conference room which may have been considered sufficient to give it such a large GT\_safety. The manufacturer, the Norwegian shipbuilder Vard, has been contacted for more information.

It seems unlikely that the GT\_safety information held in the fleet registry is accurate or complete and most of the vessels that were originally given a GT\_safety allowance have been decommissioned. Most of the vessels on the list were constructed before 2000 with the oldest going back to 1953. It is possible that the national fleet registers may have better or more up to date information, although this should only be a subset of the EU Registry.

**Figure 53 – Gross safety tonnage (GT\_safety) as taken from the EU Fleet Register**  
**a) Actual GT\_safety (removing the two figures >100t) and b) as a proportion of GT**

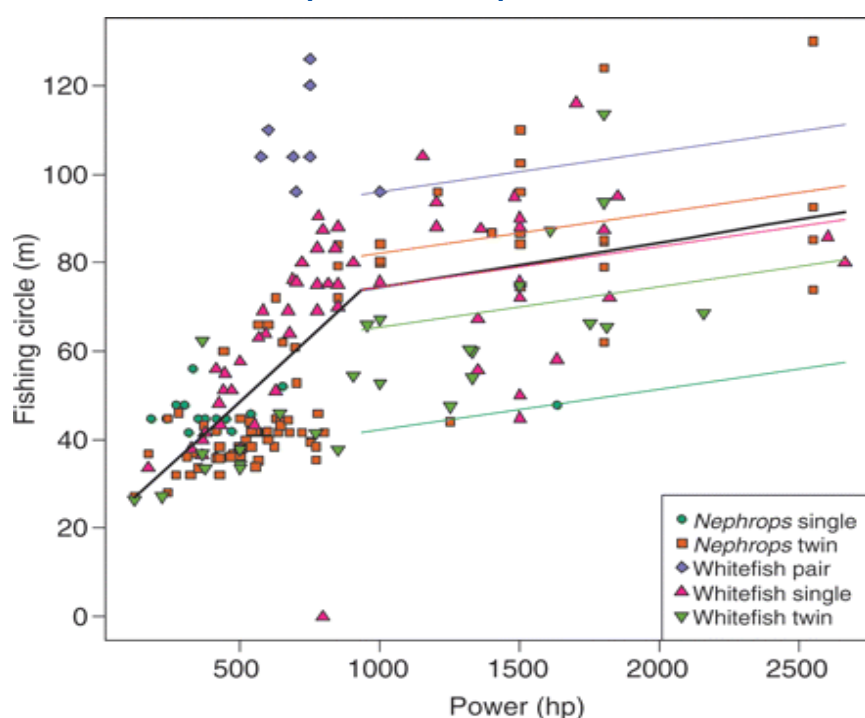


## Annex 8: Relationships between fleet capacity metrics and gear size and geometry

As observed by Reid et al. (2011), vessels of 500 and 1,000 horsepower towing the same size net at the same speed would have the same fishing power, assuming the net size defines the “ability to catch fish”. Observations (see Figure 54) show that vessels often tow the same gear size, regardless of engine power. However, more powerful vessels may be capable of towing at faster speeds, which increases the swept area, and consequently, their catching ability.

In many fleet segments in Scotland and Ireland, vessel power (kW) is not a good predictor for gear size, as larger vessels are often designed for reasons unrelated harvesting capacity. In such cases, gear size also becomes a poor predictor of the harvesting capacity. However, in some segments, a relationship between harvesting capacity and gear size does exist. Given that most effort-control regimes are based on the kW-day approach, this finding highlights a major flaw in the failure to account for gear size in effort calculations. To ensure effective effort-based management, more detailed categorisation, ideally at the fishery level, is needed to reflect these differences (see Section 3).

**Figure 54 – The relationship between fishing circle and vessel power. The black line is the segmented regression, and the coloured lines show the GLM fitted to data above the breakpoint of 934 hp**



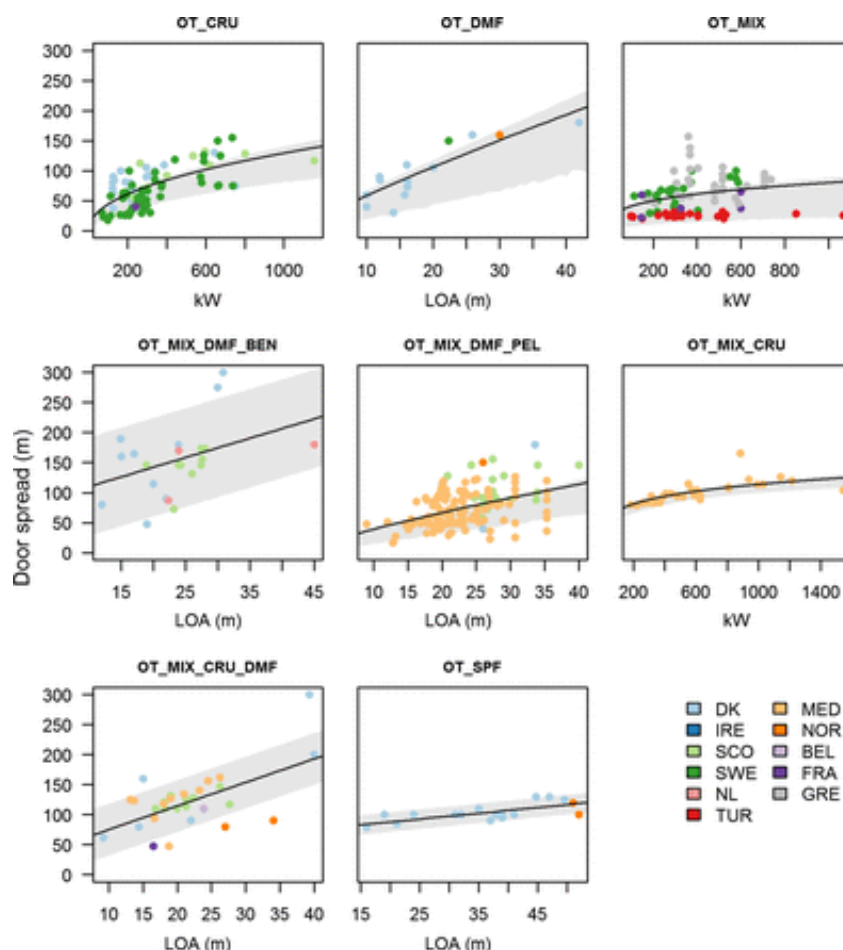
Source: Reid et al. 2011

For example, under a more restrictive kW-day regime, a large vessel that previously towed a small net could choose to increase the net size to maintain its catching potential despite a reduction in the available fishing days. If the net size

is a proxy for fishing power, then such an action could undermine, or entirely negate the intended impact of the management measure. In the case of whitefish single-trawl vessels, Reid et al. (2011), estimate the potential increase in fishing power through changes in gear size could reach 70%, which is a significant increase that should be considered in future management.

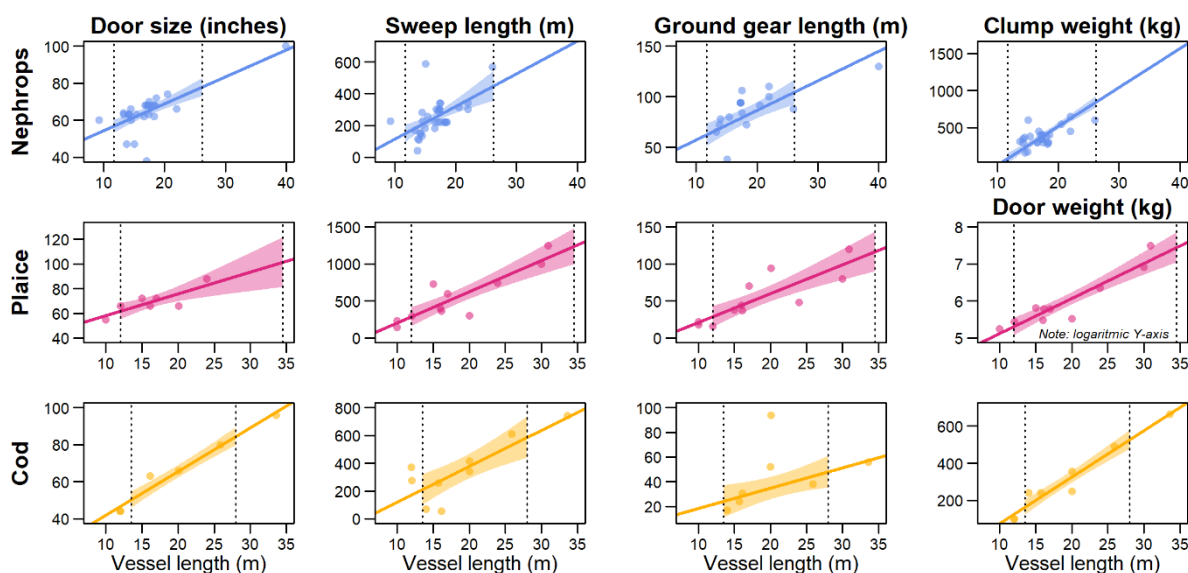
The BENTHIS industry-survey database ([www.benthis.eu](http://www.benthis.eu), Eigaard et al. 2016) represents the first attempt to include data on vessel characteristics (e.g. length, engine power), standard fishing practices (e.g. net type, fishing area, target species composition), and gear component specifications (e.g. door, ground gear, and sweep dimensions). Similar studies may also exist, particularly in technical reports and for fishing gears other than towed gears (Figure 55 and Figure 56).

**Figure 55 – Relationship between total gear width (door spread) and vessel size by BENTHIS métier for Otter Trawl (OT). The shaded (grey) areas define Monte Carlo boot-strapped 95% confidence intervals**



Source: Eigaard et al. 2016

**Figure 56 – Relationships between vessel length and various gear component dimensions for the three fisheries. Each graph includes the industry-survey based information (dots), the established relationship (line), and the 90% confidence interval (shading) for the vessel length values observed in the subsequent analysis (dotted lines). Note that door weight was log-transformed in the plaice fisheries before establishing a relation with vessel length**

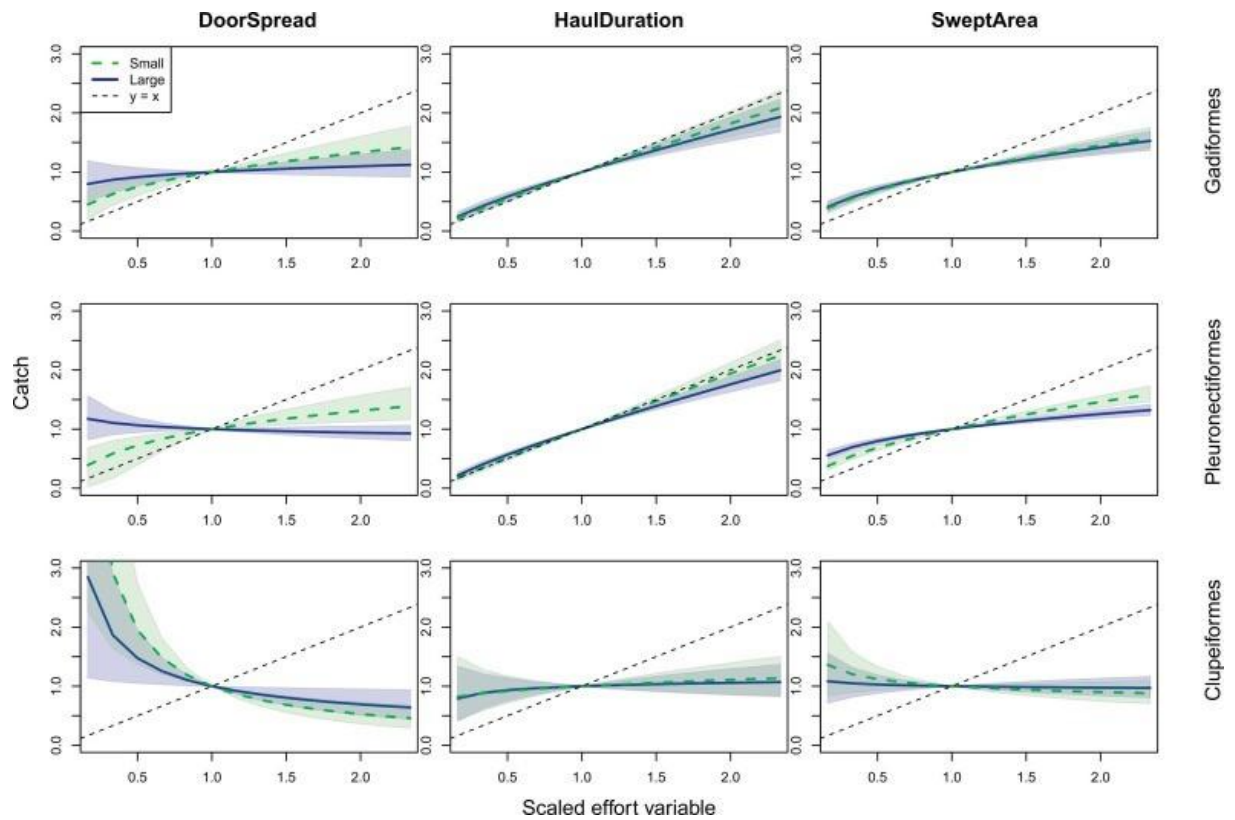


Source: van der Reijden et al. 2025

Relationships between gear geometry and catch efficiency vary depending on the target species assemblage. As shown by Berg et al. (2024) using scientific survey data, catches from a bottom trawl survey are not directly proportional to effort, and the level of this proportionality depends on the target species (Figure 57). For instance, haul duration has been found to be a better metric of effort than swept area.

In the case of Clupeiform species, catches are not correlated with effort, as expected catch levels remain largely unaffected by haul duration. It is presumed that Clupeiform catches are influenced more by the height of the top line of the trawl over the seabed. This height increases when trawl doors are positioned closer together, which may result in a negative effect of door spread on the catch of Clupeiforms.

**Figure 57 – Estimated relationship between catch and the three effort variables: door spread (M5.G, left column), haul duration (M3.HDn, middle column), and swept area (M4.SAn, right column). The dashed line indicates direct proportionality ( $y = x$ ). The x-axis has been rescaled to a mean value of 1.0 in all plots for easier comparison**



Source: Berg et al. 2024

## Annex 9: Auxiliary power in the EU Fleet Register

Among other factors, auxiliary power has been identified as a significant contributor to the overall fuel consumption in various fisheries. According to Basurko et al., (2013), the fuel consumed by auxiliary engines can account for up to 15.7% in trawling, 13.7% for purse seining, 12% in live-bait fishing, 16.5% in gillnetting, 14.3% and 10.9% for hand-line and trolling fisheries, respectively.

Any increase in auxiliary power, depending on its extent, may be directly linked to an increase in fishing gear power and, consequently, in the harvesting capacity (i.e. “ability to catch fish”). The consortium identifies the need for the power of auxiliary engines to be declared or considered, at least in vessels where a considerable percentage of fuel consumption is derived from auxiliary engines. This would ensure that the potential impact of auxiliary power on fishing is not overlooked. This would, however, exclude some fishing sectors, such as small-scale fishing vessels that, in some cases, lack auxiliary engines altogether.

**Table 57 – Percent of auxiliary kW power installed compared to kW power of the main engine as declared in the EU Fleet Register (records in Jan 2014), pooled by categories of the primary gear. Auxiliary power “includes all installed engine power not included under the heading ‘Power of the main engine’. The accuracy of the reporting of this variable is unknown and does not seem to cover all MS, even if this reporting is compulsory as stipulated in Regulation (EU) 2017/218 Annex 1.**

| Country of Registration | Beam trawl | Demersal trawl | Nets | Longline | Pelagic trawl | Pots | Seine | Purse seine | Dredge |
|-------------------------|------------|----------------|------|----------|---------------|------|-------|-------------|--------|
| BEL                     | 0          | 0              | 0    | 0        | 0             | 0    | 0     | 0           | 0      |
| BGR                     | 0          | 0              | 0    | 0        | 4             | 0    | 0     | 0           | 0      |
| CYP                     | 0          | 0              | 1    | 1        | 0             | 0    | 0     | 0           | 0      |
| DEU                     | 2          | 9              | 0    | 0        | 34            | 1    | 0     | 0           | 42     |
| DNK                     | 16         | 4              | 0    | 0        | 15            | 0    | 7     | 0           | 3      |
| ESP                     | 0          | 11             | 1    | 9        | 0             | 0    | 0     | 14          | 0      |
| EST                     | 0          | 13             | 0    | 0        | 8             | 0    | 0     | 0           | 0      |
| FIN                     | 0          | 4              | 0    | 0        | 7             | 0    | 0     | 0           | 0      |
| FRA                     | 0          | 0              | 0    | 0        | 0             | 0    | 0     | 0           | 0      |
| GRC                     | 0          | 0              | 0    | 0        | 0             | 0    | 0     | 0           | 1      |
| HRV                     | 0          | 0              | 1    | 1        | 0             | 1    | 1     | 2           | 2      |
| IRL                     | 17         | 2              | 0    | 0        | 2             | 0    | 4     | 4           | 1      |
| ITA                     | 0          | 0              | 0    | 0        | 0             | 0    | 0     | 0           | 0      |
| LTU                     | 26         | 16             | 2    | 0        | 29            | 0    | 0     | 0           | 0      |
| LVA                     | 0          | 23             | 0    | 0        | 10            | 0    | 0     | 0           | 0      |
| MLT                     | 0          | 3              | 23   | 28       | 0             | 27   | 0     | 15          | 0      |
| NLD                     | 17         | 10             | 1    | 1        | 19            | 3    | 38    | 0           | 20     |
| POL                     | 0          | 5              | 0    | 1        | 12            | 0    | 0     | 0           | 0      |
| PRT                     | 9          | 2              | 8    | 2        | 0             | 3    | 10    | 2           | 7      |
| ROU                     | 0          | 0              | 0    | 0        | 0             | 0    | 0     | 0           | 0      |
| SVN                     | 0          | 1              | 0    | 0        | 0             | 0    | 0     | 10          | 0      |
| SWE                     | 1          | 3              | 0    | 0        | 15            | 0    | 0     | 0           | 0      |



## Annex 10: Estimates for converting one unit of capacity from one fishery to another

The fishing industry faces challenges associated with vessel modernisation aimed at improving safety and working conditions, alongside the necessity of adaptation for energy transition. This report examines the regulatory constraints limiting fishing capacity – specifically, the limits on GT and kW capacity – as outlined in Articles 22 and 23 of the CFP and Articles 18 and 19 in the EMFAF. An analysis of the potential benefits of vessel lengthening for enhanced hydrodynamics and fuel efficiency is hereafter mentioned, that would be beneficial for some specific fisheries (those for which the time spent at steaming is important), alongside a discussion regarding the qualifications outlined in existing regulations. Recommendations for regulatory adjustments and technological advancements are made to optimise fishing fleet capacity monitoring while ensuring sustainability.

### State of the play

Vessel modernisation (to improve safety/working conditions) and adaptation to energy transition is warranted as a fraction of active EU vessels is quite old (see Table 31 – Deduced from the EU fleet register for all vessels present in the register on the 1st of January 2024 in Annex 3) and sometimes, for example, would not have the proper comfort (e.g. sanitation) to attract young fishers.

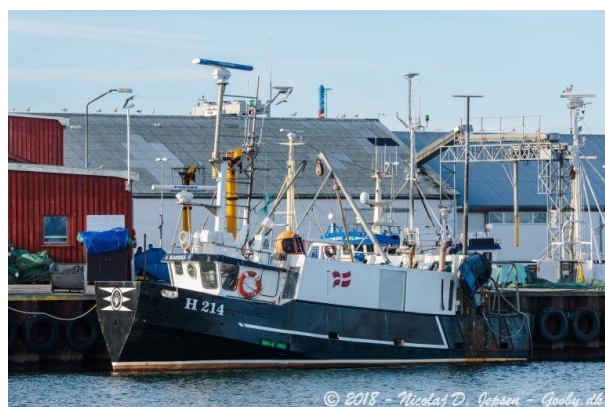
The ILO Work in Fishing Convention 188 (C188) in Annex 3 “Fishing vessel accommodation” lists the safety issues that should be avoided for the crew onboard fishing vessels, including design and construction, noise and vibration, ventilation, heating and air conditioning, lighting, sleeping rooms, mess rooms, tubs or showers, toilets and washbasin, laundry facilities, facilities for sick and injured fishers, recreational facilities, communication facilities, galley and food storage facilities, food and potable water, clean and habitable conditions. Control with inspections is key in this, and the ILO C188 stipulates that “the competent authority shall inspect the [crew] accommodation for compliance with the requirements of the Convention” each time such accommodation is refitted. Very few studies have found descriptions of safety issue specific to some fishing. However, Chauvin et al. (2017) found that the fishery types ('high seas fishery', 'offshore fishery', 'coastal fishery' and 'inshore fishing') are key for explaining risk. The highest incidence rates occur during operations related to operating the fishing gear. However, the incidence rate depends more on the fishery type than the fishing activity (active vs passive). For coastal fisheries, there is no difference in incidence rates between passive and active gears; in offshore fisheries there is a small difference (more incidences in active fisheries). For offshore fisheries, the weather conditions are related to the incidence rate. However, as expected, the type of accidents is related to the fishing activity. The ones in the category 'being struck, swept along, pinned' are overrepresented in the dredging activity

and underrepresented in netting activity. Accidents of the type 'being cut or pricked by' are over-represented in potting and lining activities.

Hence, albeit there is no specific comparison between gear types (e.g. beam trawl vs. otter trawl), according to Chauvin et al. (2017), fishery type (high seas, offshore, coastal, or inshore fishery) seems to be way more related to occupational injuries than fishing activity. There is a lack of public information about safety on the level of gear types.

Regulatory barriers exist that currently possibly prevent the agility that may be required for adapting fleet capacities to contemporary standards and environmental demands. The restrictions imposed by the CFP (Article 23) particularly limit the substitution of fleet capacity, possibly favouring the use of multiple smaller vessels over fewer, larger, and more efficient ones. Regulatory barriers (Article 22 and Article 23 of the CFP and EMFAF Articles 18 and 19 eligibility criteria) potentially prevent lengthening the vessel to accommodate such changes. This is sometime perceived as counterproductive when lengthening the vessel is likely to provide better hydrodynamics and save fuel (see the “Kanista” vessel picture (see Figure 58) and threshold effect on length size group). The same effect was also observed in Norway (Dag and Ahlquist, 2025). To maximize capabilities in fish handling, storage, and crew accommodations under new length restrictions, new vessels have been built with extreme breadth, height, and depth ratios. These vessels are also known as "paragraph vessels". However, the new design approach did not follow optimal hydrodynamic principles for either efficient seakeeping performance or fuel efficiency. The primary focus of these new built vessels was to conform to strict length restrictions while accommodating the fishers' strategy to enhance technical capacities.

**Figure 58 – Example of extreme threshold effects induced by the regulation on vessel length on the final LOA of the refit (left)/newly built (right) vessels.**



Source: MarineTraffic

In the EU, the 2013 CFP Article 23 restricts the substitution of fleet capacity, possibly allowing more but smaller vessels if a given capacity is dispatched among two or more vessels of similar overall capacity. However, it would be

expected that for optimisation purposes, two old vessels could be replaced by one more efficient new vessel, and CFP Article 23 does not prevent this.

Based on this, a question is posed about the feasibility of increasing a vessel's GT and/or kW without increasing its ability to catch fish. The relationship between vessel capacity (GT and kW) and fishing effectiveness is complex and linked to fishing techniques and technology (hereafter called “fisheries”). Larger vessels equipped with bigger fishing gears can achieve greater catch efficiency, moving to more remote fishing grounds and extending their time at sea (e.g., with Refrigerated Sea Water (RSW) systems onboard).

The search is for the “ability to catch fish” to remain unaffected by increasing GT solely for the purpose of installing alternative, non-fossil fuel engines or providing additional onboard space.

### **The need for a conversion matrix**

To reach this goal a clear conversion matrix would be developed for each refit solution. The ability to catch fish would ideally not link to increasing GT to accommodate a new engine using an alternative to fossil fuel solutions or to accommodate more space for living onboard, as long as a conversion matrix could be provided for each equipment/refit solution to provide the extra space needed per solution. Developing and ensuring a controlling procedure is necessary to verify no improvement in the ability to catch fish during the construction/refit phase.

Because various fishing techniques are not as efficient in catching the same or different species, it is observed that one kW or GT in a fishery is not equivalent to one kW and GT in another fishery. Statistical modelling can provide those units and the resultant catch efficiency (see Figure 59 and Figure 60). Such estimates can be deduced applying a (GLM-type) statistical model to the NEA dataset (see Section 3). Statistical modelling indicates variations in the equivalence of kW and GT across different fisheries. Furthermore, technological advancements (so-called “technological creeping”) can lead to gradual improvements in efficiency with similar kW or GT capacity.

The fishing capacity allocation among the segments of Member State is determinant to anticipate the overall harvesting capacity of a given national fleet. Removing some fishing capacity (e.g. via exit of vessels), is also not expected to remove the same harvesting capacity, or impacting the same stocks given the preexisting differences in harvesting capacity. This mainly links to the fact that kW and GT are not always relevant to measure the fishing capacity as the catching method and vessel size are major drivers in explaining the differential “ability to catch fish” (see Annex 5).

Converting the capacity measured in kW, conversion factors from existing to alternative innovative solutions or alternative fisheries to conduct the fishing are key. Hence, for example, a 1 kW output from a diesel engine is likely not

equivalent to a 1 kW output from an electric engine due to power conversion losses. Combustion processes in fuel use are inherently inefficient, resulting in some energy loss. Therefore, an electric engine may require significantly less kW to achieve the same speed or service. It is required to determine the translation or conversion factor, as both systems have wasted energy. Besides this, in a dual-engine setup, the power conversion dynamics differ because the diesel engine is used to recharge the battery pack of the electric engine. For example, this is seen in the SEAGLOW project (applied to small-scale fishing).

**Figure 59 – Predicted catch supplement per species (FAO code) if adding 1000 GT\_days in a given COUNTRY\_GEAR-GROUP combination. Based on 2023 catch and effort data in the NEA only, those data linked to the EU Fleet Register. A dark green cell marks zero-catch anticipated for this species and segment, while red cells marks a large catch is anticipated on a species per 1000 GT.days deployed into a segment**

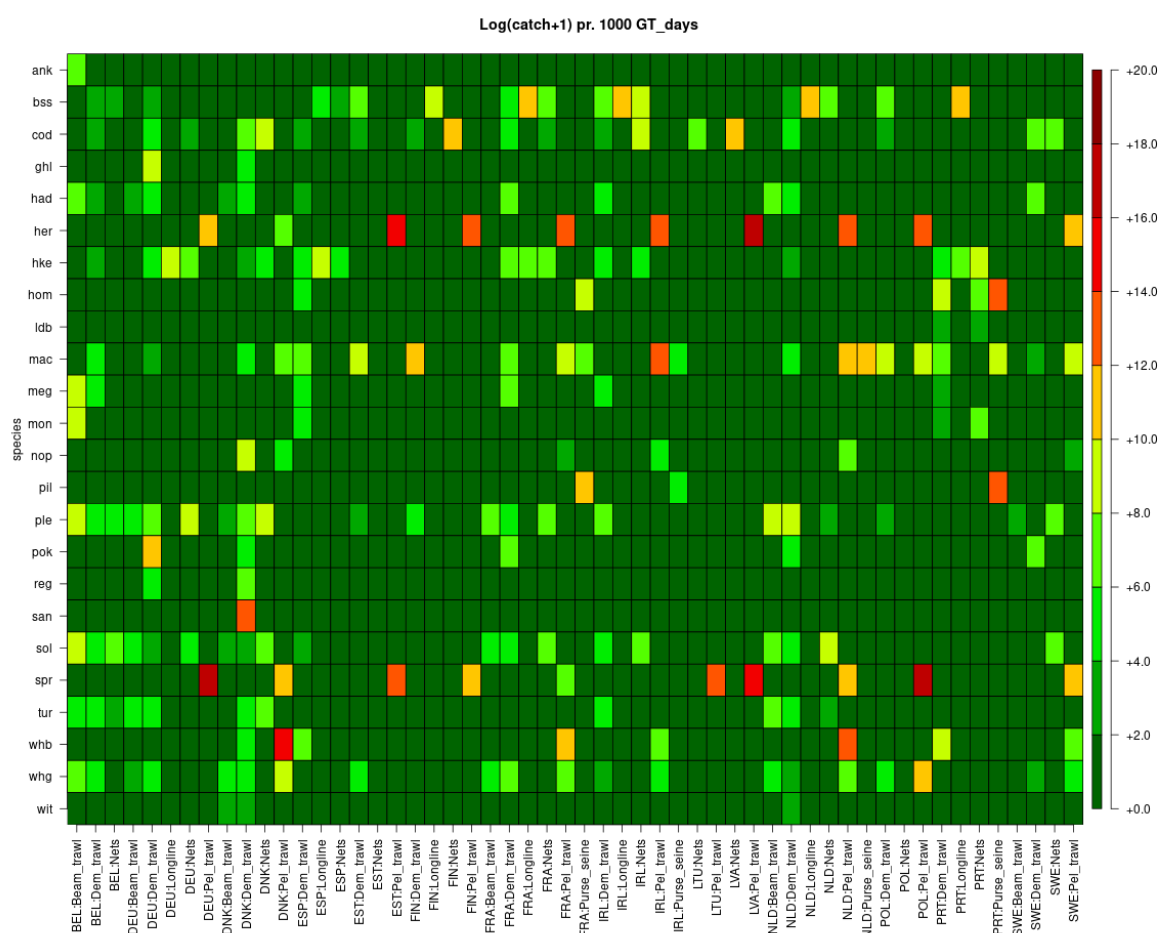
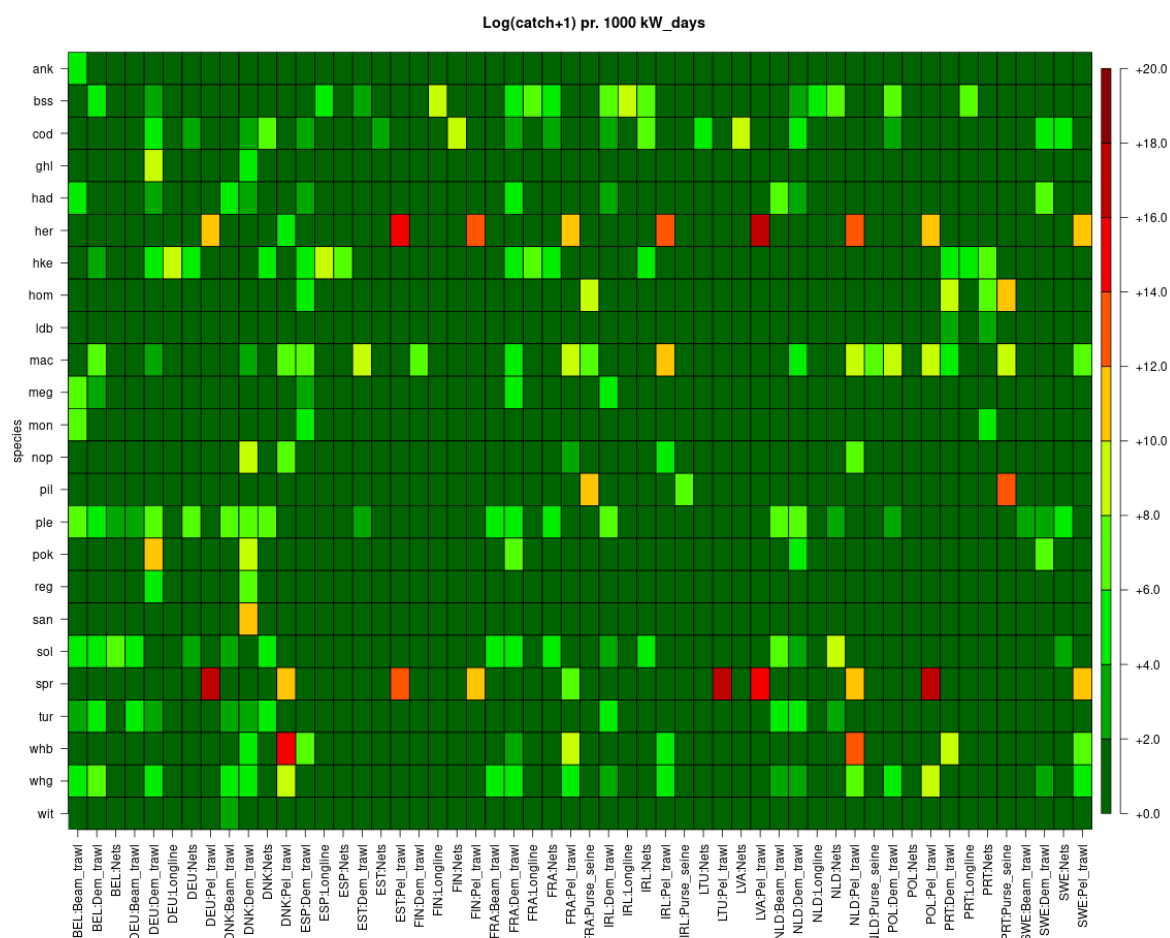
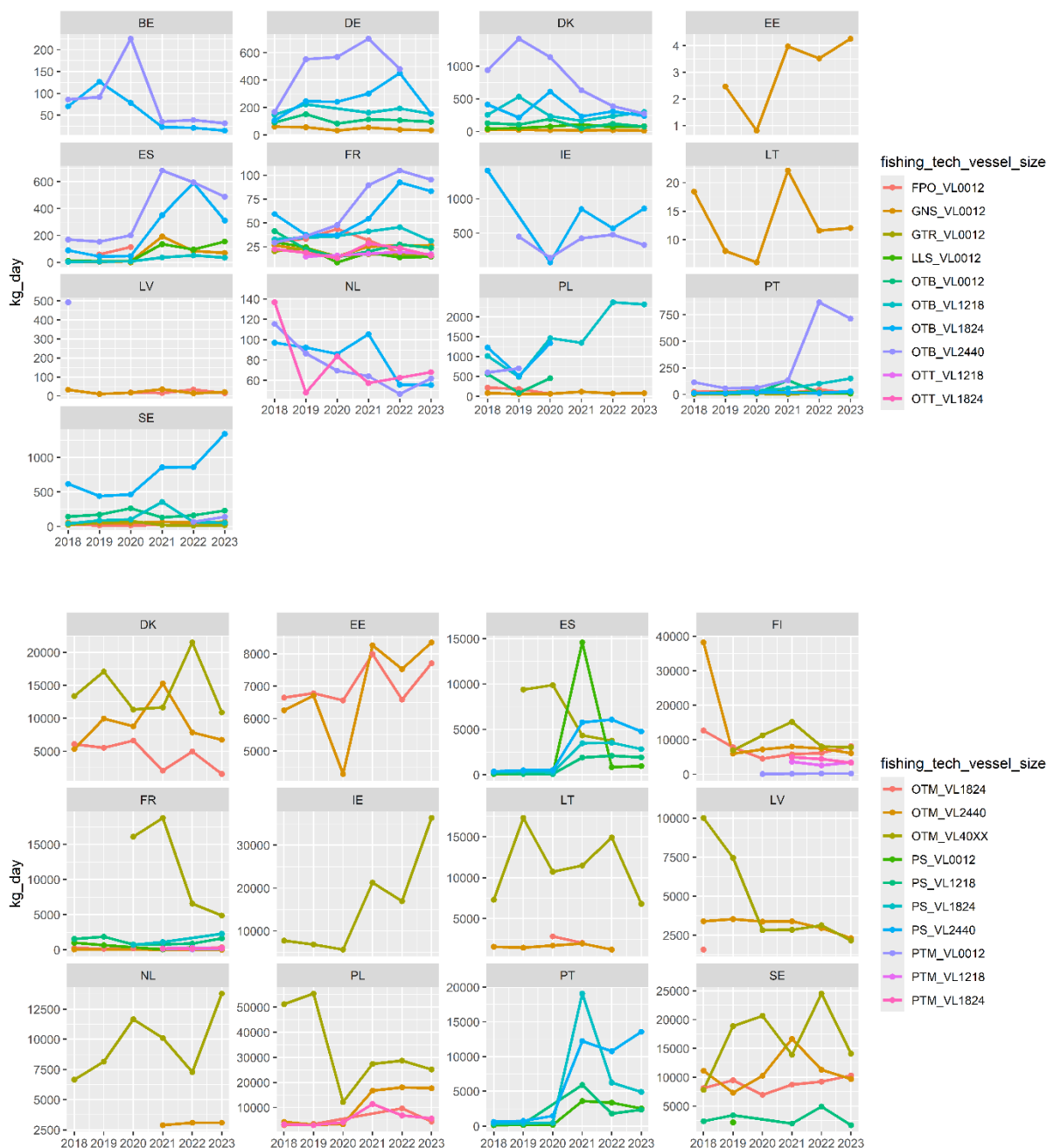


**Figure 60 – Predicted catch supplement if adding 1000 kW\_days in a given COUNTRY\_GEARGROUP combination. Based on 2023 catch and effort data in the NEA only, linked to the EU Fleet Register**



Ideally, such statistical analysis would be repeated on a time series of data, as the estimation of catch efficiency should account for the various underlying stock biomasses. This would make possible to identify the effect of an improvement of the catch efficiency over years (“technological creeping”), if any (see Figure 61).

**Figure 61 – Catch rates (kg per day, all species pooled) over 2018-2023 years per fleet-segments in the NEA and split per Member State. Top: demersal segments, bottom: pelagic segments**



## Considerations when converting across fisheries

The advice is to “not electrify the vessel, but rather the operation.” When examining the fishing operation, it may be the case that much less kW power is needed than what is currently installed. In some instances, SEAGLOW found that some vessels are heavily over-motorized compared to the required kW for operating the fishing equipment (SEAGLOW, personal communication). For example, vessels with installed power of several kW, can sometimes only



requires about 5 kW for its operations, as some fishing techniques (e.g. jigging and netting) may require very little engine power. This oversizing of engines can be problematic. It is also known that the optimal use of a diesel engine occurs at 85% load. Over-motorization can be detected whenever the actual 85% load on engine power is much bigger than the required to operate/tow a trawl. As a side effect, an oversized engine may also make it unsuitable to advise for “slow steaming” because it is not optimal sometimes to reduce speed with such an engine. Hence, converting a given vessel capacity into several vessels could save fuel by downscaling the engine. Still, the FUI could be negatively impacted as the catch outcome is likely to be reduced as well (if a non-linear relationship is observed between kW and catch outcome). Over-motorisation is common when vessels' skippers fear they lack enough power to handle rough weather conditions at sea. Therefore, we must remember that introducing an electrical vessel solution is electrifying not just the vessel but the fishing operation itself. For instance, many vessel captains are hesitant to shut down their engines while at sea. Pertaining to this, there are some indications that over-motorisation is widespread <sup>(121)</sup>. Fishers usually anticipate that they may go in the future for bigger nets, therefore requiring more kW. Hence it appears there is some room for decreasing individual kW vessel from such a misfit, either by limiting the oversizing, or by switching to passive gears, require much less power, even if some enough power is needed to ensure safe operation in rough weather.

In practice, a hybrid dual-engine system is often seen as more practical, as certain segments of the trip are more suited for the electric engine, while others are better for the diesel engine. Hence different fishing techniques may pose different risks when operating fishing. What should be investigated is then what are the relative risks in safety operating different fishing techniques such bottom trawls vs bottom set nets, etc. (occupational risk is fishery related) <sup>(122)</sup>. The switch of numerous fishers to operate trawling in the 70s or 80s instead of longlining may have been driven by trawling being easier to operate than the latter, also with higher initial profitability.

## References

- Bastardie, F., Hornborg, S., Ziegler, F., Gislason, H., & Eigaard, O. R. (2022). Reducing the Fuel Use Intensity of Fisheries: Through Efficient Fishing Techniques and Recovered Fish Stocks. *Frontiers in Marine Science*, 9, 817335.
- Basurko, O.C., Gabiña, G., Uriondo, Z., 2013. Energy performance of fishing vessels and potential savings. *Journal of Cleaner Production* 54, 30-40.
- Chauvin C, Le Bouar G, Lardjane S. Analysis of occupational injuries in the sea fishing industry according to the type of fishery and the fishing activity. *Int Marit Health*. 2017;68(1):31-38. doi: 10.5603/IMH.2017.0006. PMID: 28357834.
- Corvus-Energy, 2015. KAROLINE. <https://corvusenergy.com/projects/karoline-2/>

<sup>(121)</sup> ASFEECH Rapport Final (Amop, FFP, Cevalmar)

<sup>(122)</sup> [https://www.europarl.europa.eu/RegData/etudes/STUD/2024/747290/IPOL\\_STU\(2024\)747290\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2024/747290/IPOL_STU(2024)747290_EN.pdf)



- Marine Instruments, AZTI, Newcastle University, Zephyr, Maridis, Sintef, EHU, Echebaster,, 2022. Sustainable tuna fisheries through advanced earth observation technologies. SUSTUNTECH, in: 2020., E.U.H. (Ed.).
- GFCM, 2023. Workshop on the Decarbonization of the Fishing Industry (WKDECA). FAO headquarters, Rome, Italy, 14–15 March 2023. Report. 18 pp.
- ILO C188.  
[https://normlex.ilo.org/dyn/nrmlx\\_en/f?p=NORMLEXPUB:12100:0::NO::P12100\\_INSTRUMENT\\_ID:312333](https://normlex.ilo.org/dyn/nrmlx_en/f?p=NORMLEXPUB:12100:0::NO::P12100_INSTRUMENT_ID:312333)
- Sala, A., Damalas, D., Labanchi, L., Martinsohn, J., Moro, F., Sabatella, R., Notti, E., 2022. Energy audit and carbon footprint in trawl fisheries. *Scientific Data* 9(1), 428.
- Standal, D., & Ahlquist, I. H. (2024). Transforming coastal fisheries in Norway: Institutional implications of green technology implementation. *Marine Policy*, 171, 106471. <https://doi.org/10.1016/j.marpol.2024.106471>

## Annex 11: Illustrative images of different technology installation designs

The European fishing fleet needs to transition to reduce greenhouse gas emissions. Although the fishing sector is relatively small in terms of overall emissions, it is nonetheless necessary to invest in new engine technologies. These new technologies, based on what is currently known, may need more onboard space, which implies that vessels may need to be larger in order to maintain the same level of productivity. An example from Germany illustrates a concept design for a new type of coastal fishing vessel (see Figure 62). The proposal involves exchanging old shrimp fishing vessels, mostly 16.5 m in length with a new 19.5 m long new vessel that offers more flexibility regarding fishing methods. The new vessel will be equipped with a methanol engine, and its fuel tanks will be significantly larger than those on the older diesel-powered vessels. However, such a new vessel is likely to be feasible only if vessel owners benefit from the removal of several vessels to accommodate a single replacement, given the extra GT needed to fit such engines.

**Figure 62 – Concept for a new coastal fishing vessel**



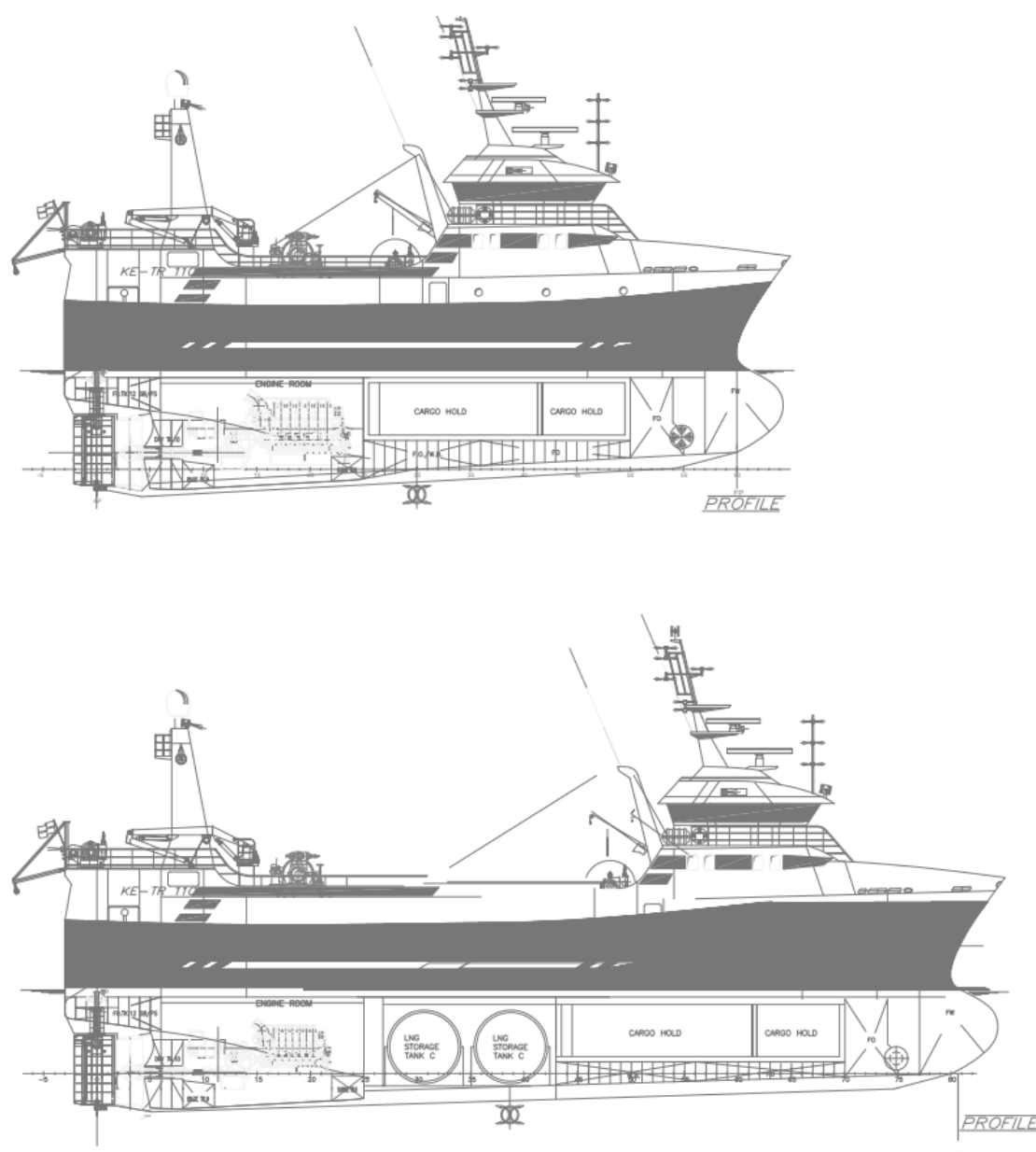
Source: Konzept eines emissionsarmen Fischereifahrzeuges <sup>(123)</sup>

The need for more space to fit new facilities onboard fishing vessels when retrofitting existing vessels is exemplified from previous studies. A study was carried out by Leira (2018) to assess the feasibility of using LNG in fishing vessels (see Figure 63).

<sup>(123)</sup> <https://www.deutsche-flagge.de/de/redaktion/dokumente/dokumente-sonstige/handout-konzept-eines-emissionsarmen-fischereifahrzeug-1-003.pdf>

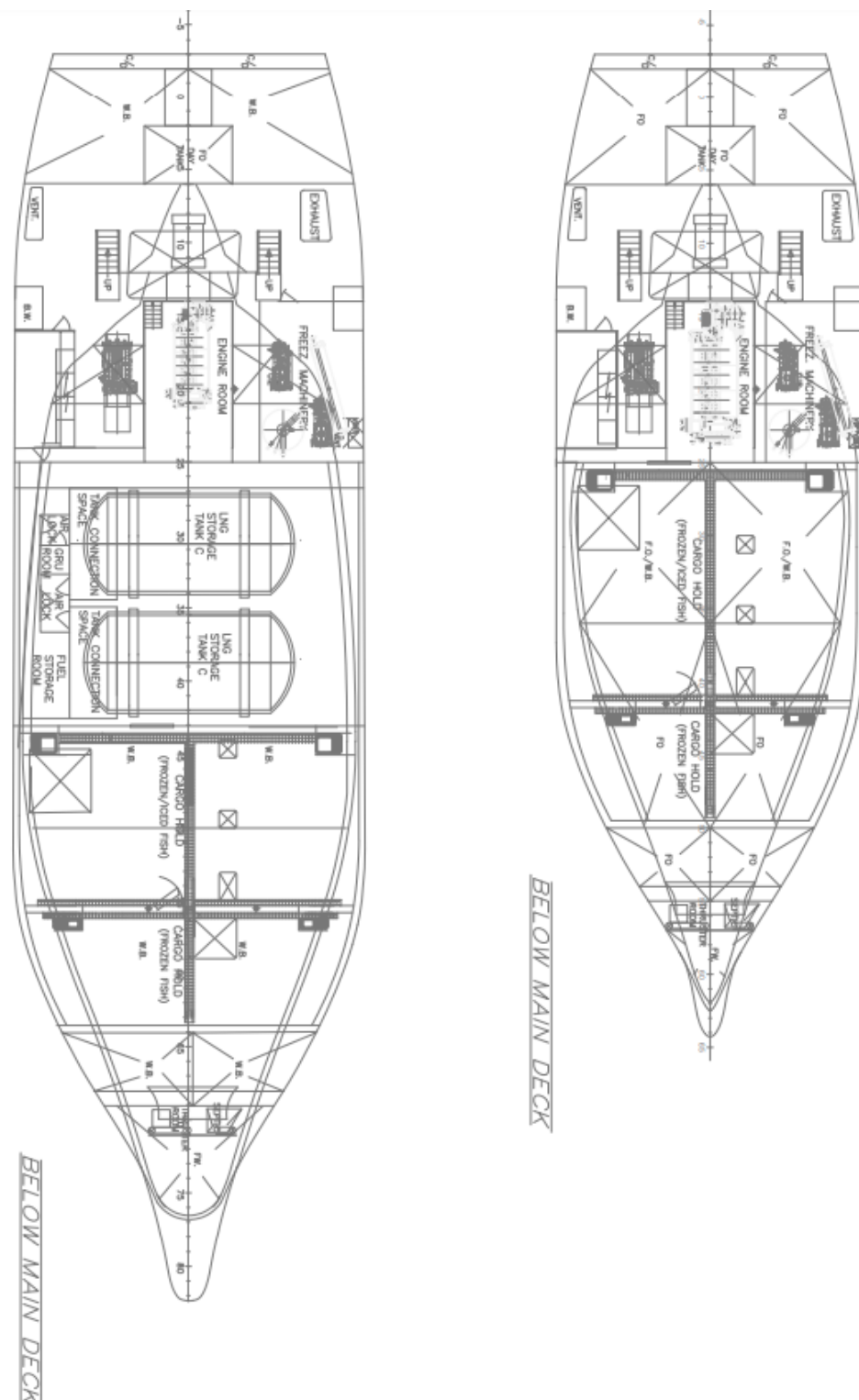
Further examples, shown in Figure 64, Figure 65, Figure 66, Figure 67, and Figure 68 are drawn from a recent feasibility study carried out by Fisheries Innovation and Sustainability (FIS, 2023), which explored different propulsion systems aimed at reaching net zero emissions in different types of fishing vessels. These designs broadly assess the structural modifications needed and illustrate the required changes in vessel dimensions.

**Figure 63 – Details of 39.79 m factory trawler modification to install LNG propulsion system would lead to a 41.06 m refit vessel to accommodate for the larger fuel tank volume required for LNG**



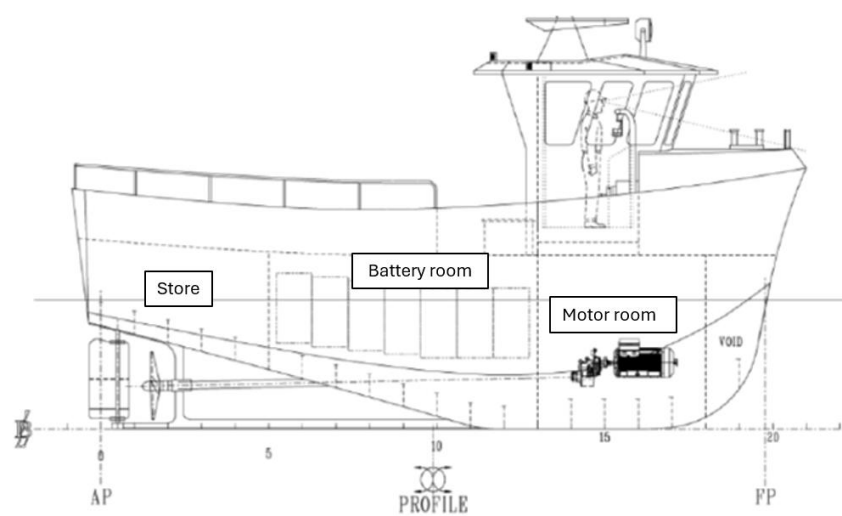
Source: Leira, 2018 (pp. 57-58)

**Figure 63 (cont.) – Details of 39.79 m factory trawler modification to install LNG propulsion system would lead to a 41.06 m refit vessel to accommodate for the larger fuel tank volume required for LNG**



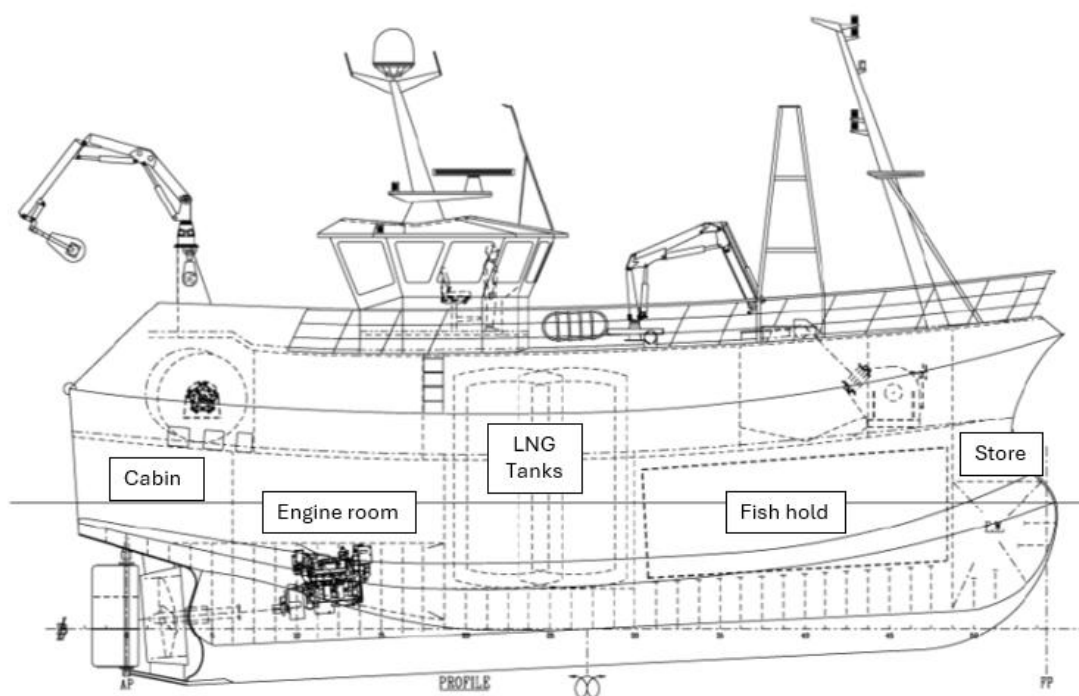
Source: Leira, 2018 (pp. 57-58)

**Figure 64 – Details of 10 m pot fishing vessel with electric propulsion**



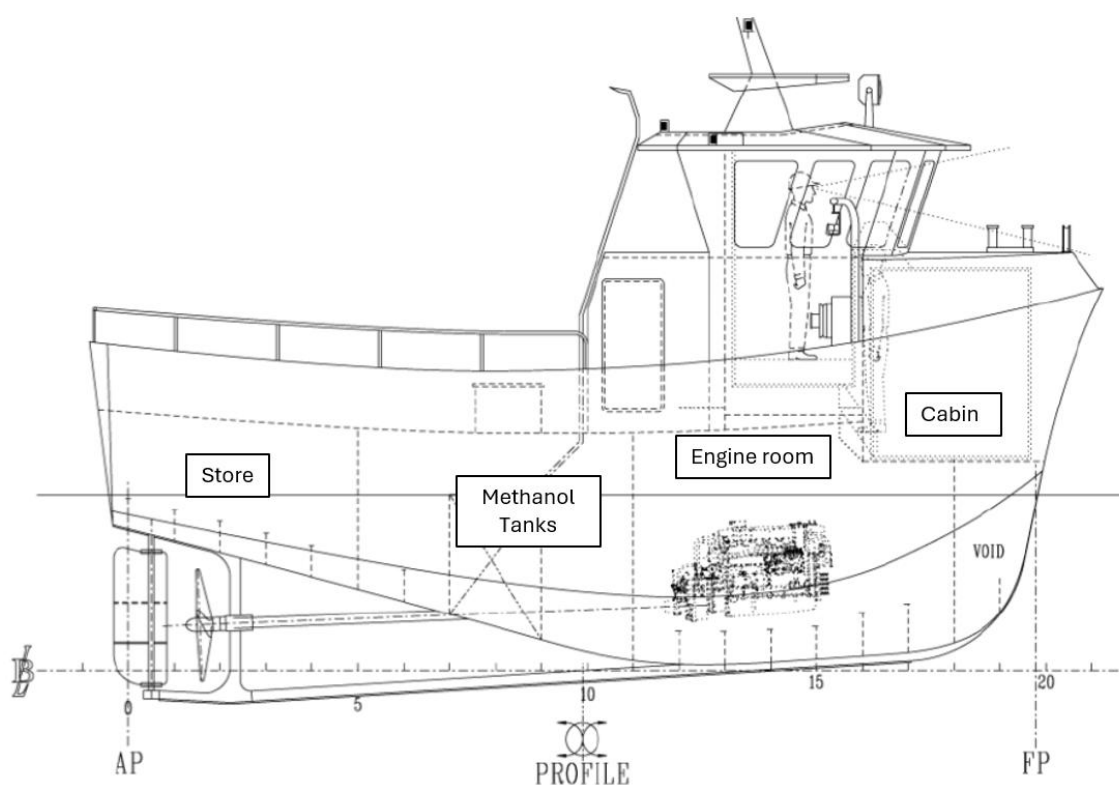
Source: FIS, 2023 (p. 17).

**Figure 65 – Details of 16.7 m trawler using LNG**



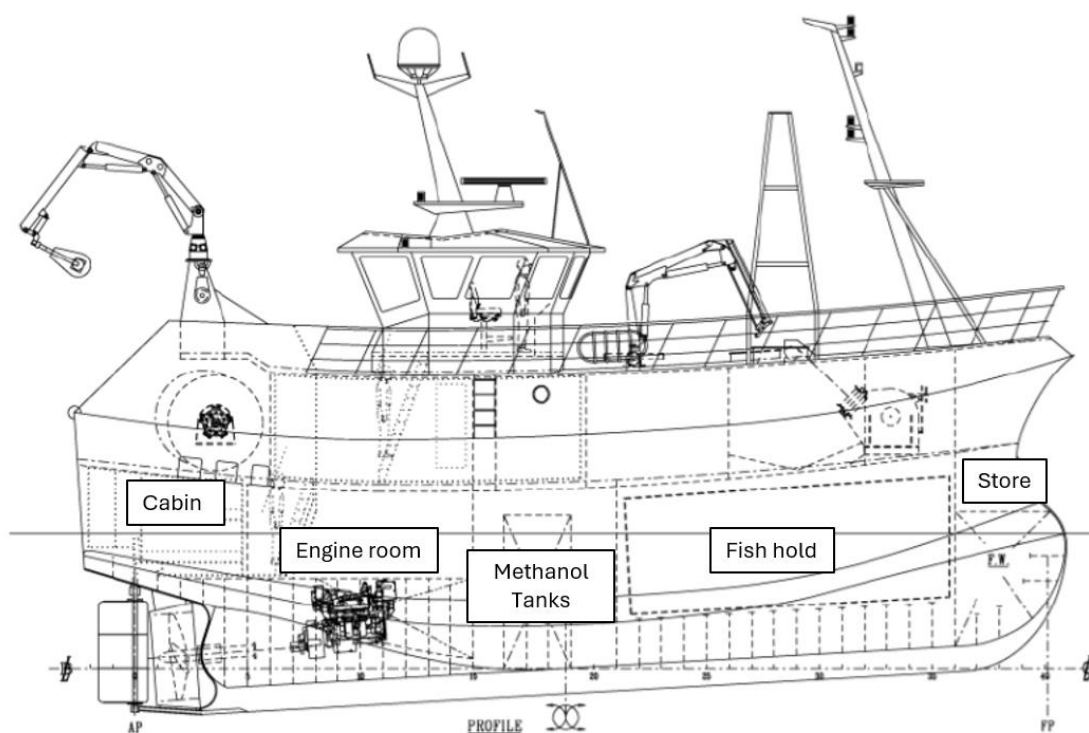
Source: FIS, 2023 (p. 33)

**Figure 66 – Details of 10 m pot fishing vessel using methanol**



Source: FIS, 2023 (p. 22)

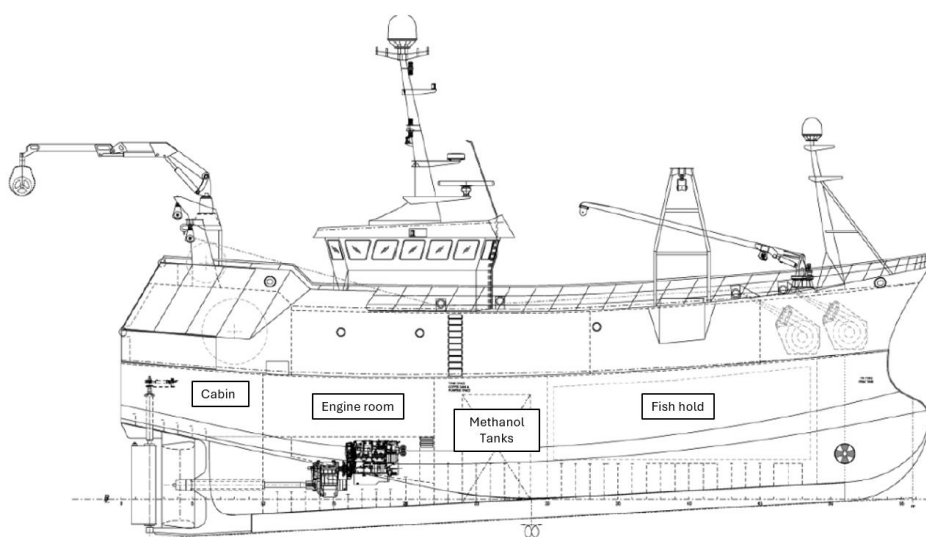
**Figure 67 – Details of 16.7 m trawler using methanol**



Source: FIS, 2023 (p. 27)



**Figure 68 – Details of 24.5 m trawler using methanol**



Source: FIS, 2023 (p. 39)

In France, much stress is put to develop new hydrogen-powered fishing vessels or retrofit old vessels to this technology. The PILOTHY project, for example, introduces a hydrogen fuel cell in refit on a fishing vessel to cover 10-15% of energy needs and save 500 litre of diesel per trip, consuming 90kg H<sub>2</sub> per trip for 3.5 days autonomy (Figure 69). However, besides financial unviability of the retrofit (the retrofit also costs 75% of the cost for a new vessel), unexpected consequences discovered alongside the project included a ca. 20% GT increase, a 30% reduction in vessel fish hold capacity and a 30% increase in power consumption

**Figure 69 – Example of a hydrogen-powered fishing vessel: PILOTHY project (Coprexma naval architect)**

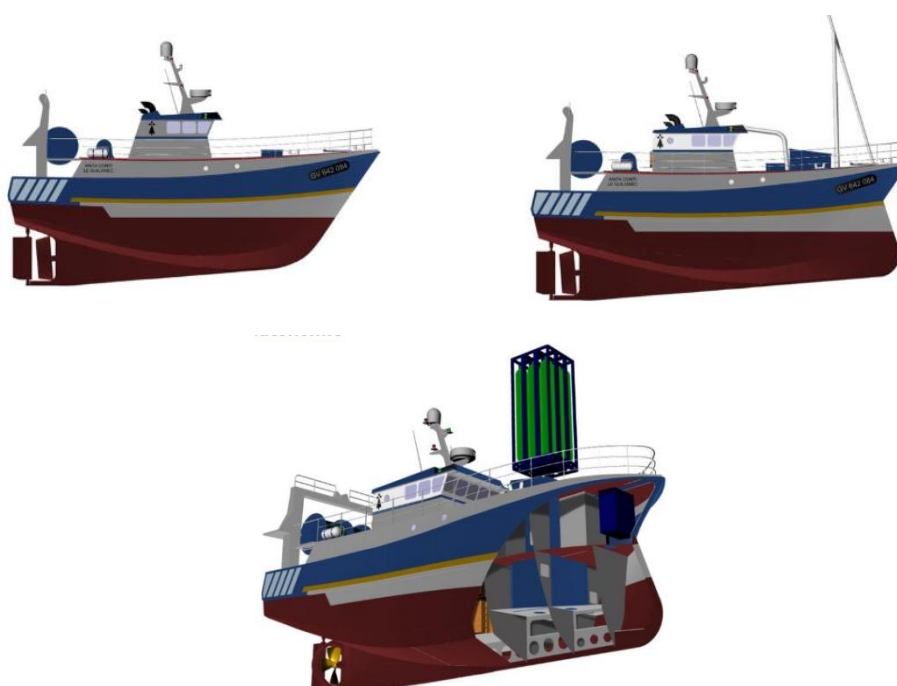
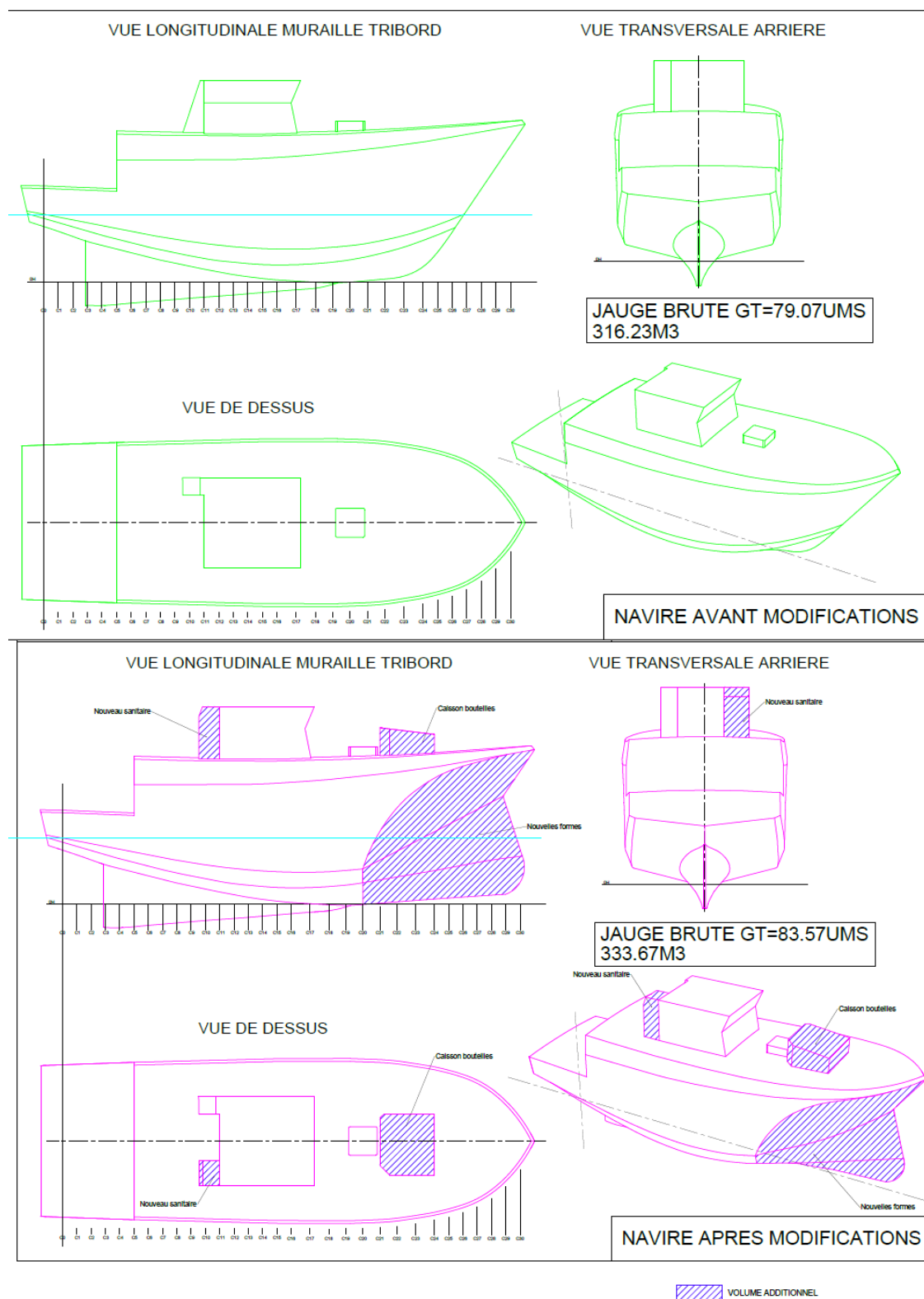




**Figure 69 (cont.) – Example of a hydrogen-powered fishing vessel: PILOTHY project (Coprexma naval architect)**



## Annex 12: Challenges in funding support to managing EU fishing capacity

Despite the availability of financial tools, several challenges remain in aligning the EU's financial capacity with its policy ambitions for managing fishing capacity, notably:

- overcapacity persistence: Despite financial support for decommissioning and scrapping vessels, overcapacity remains an issue. Political and economic pressures from Member States, particularly those with large fishing industries, have often led to the reluctance to implement necessary fleet reductions. Moreover, such overcapacity impairing the profitability of the sector prevents the fleet modernisation to be achieved by own financial means as it would be expected in healthy and balanced private businesses.
- Vessel modernisation vs. capacity reduction: Funds meant for fleet modernisation (e.g., improving energy efficiency or safety) have often indirectly led to increased fishing efficiency, offsetting the capacity reduction efforts (see Task 5 findings). This has been recurring criticism, especially in evaluations of the EFF and EMFF.
- Socio-economic Impact: Financial programs like the EFF, EMFF, and EMFAF have struggled to balance fleet reduction with the socio-economic needs of coastal communities (see Task 1 outcomes). The loss of livelihoods and decline of coastal economies followed and amplified by vessel decommissioning have led to a push back from some local populations, making fleet reduction politically challenging (see German or Dutch cases).
- Data and monitoring gaps: While tools like the DCF and the Fleet Register have provided valuable data, there are still gaps in data collection and inconsistent reporting across Member States, which hinders the ability to fully evaluate and enforce fleet capacity management.

The evaluation of scientific instruments and monitoring programs reveals significant progress in tracking fishing capacity and sustainability, particularly through the evaluation made by the **STECF** based on the DCF data. However, challenges remain in data accuracy and political commitment of some MS. Financial instruments such as the **EFF**, **EMFF**, and current **EMFAF** have provided crucial support for fleet management, but balancing fleet reduction with modernisation and socio-economic concerns has proven difficult. Aligning financial capacity with policy ambitions requires continued attention to the social impact of fleet reduction and the need for improved monitoring and enforcement.

Hence, there are opportunities that may enable the fishing sector to address the energy transition. For example, the EMFAF <sup>(124)</sup> includes some changes to financial support for investments on board vessels for energy efficiency or

---

(124) OJ L 247, 13.7.2021, ELI: <http://data.europa.eu/eli/reg/2021/1139/oj>

improved working and safety conditions, even if the individual gross tonnage of the vessel increases, as long as this does not lead to an increase in the Member States' overall fishing capacity.

**Box 2 - EMFAF (Regulation (EU) 2021/1139) Article 19**

Increase in the gross tonnage of a fishing vessel to improve safety, working conditions or energy efficiency.

1. By way of derogation from point (a) of Article 13, the EMFAF may support operations that increase the gross tonnage of a fishing vessel for the purposes of improving safety, working conditions or energy efficiency.

The support referred to in the first subparagraph shall contribute to the specific objective referred to in point (a) of Article 14(1).

2. Support under this Article may be granted only under the following conditions:

- (a) the fishing vessel belongs to a fleet segment for which the latest report on fishing capacity, referred to in Article 22(2) of Regulation (EU) No 1380/2013, has shown a balance of the fishing capacity of the segment with the fishing opportunities available to that segment;
- (b) the fishing vessel is not longer than 24 metres in overall length;
- (c) the fishing vessel has been registered in the Union fleet register for at least the 10 calendar years preceding the year of submission of the application for support; and
- (d) the entry into the fishing fleet of new fishing capacity generated by the operation is compensated for by the prior withdrawal of at least the same amount of fishing capacity without public aid from the same fleet segment or from a fleet segment for which the latest report on fishing capacity, referred to in Article 22(2) of Regulation (EU) No 1380/2013, has shown that the fishing capacity is not in balance with the fishing opportunities available to that segment.

3. For the purposes of paragraph 1, only the following operations shall be eligible:

- (a) the increase in gross tonnage necessary for the subsequent installation or renovation of accommodation facilities dedicated to the exclusive use of the crew, including sanitary facilities, common areas, kitchen facilities and shelter deck structures;
- (b) the increase in gross tonnage necessary for the subsequent improvement or installation of on-board fire prevention systems, safety and alarm systems or noise-reduction systems;
- (c) the increase in gross tonnage necessary for the subsequent installation of integrated bridge systems to improve navigation or engine control;
- (d) the increase in gross tonnage necessary for the subsequent installation or renovation of an engine or a propulsion system that demonstrates a better energy efficiency or lower CO<sub>2</sub> emissions compared to the previous situation, which does not have a power exceeding the fishing vessel's previously certified engine power pursuant to Article 40(1) of Regulation (EC) No 1224/2009, and whose maximum power output is certified by the manufacturer for that engine or propulsion system model;
- (e) the replacement or renovation of the bulbous bow provided that it improves the overall energy efficiency of the fishing vessel.

4. As part of the data provided pursuant to Article 46(3), Member States shall communicate to the Commission the characteristics of the operations supported under this Article, including the amount of the fishing capacity increased and the purpose of that increase.

5. Support under this Article shall not cover operations related to investments aimed at improving safety, working conditions or energy efficiency where such operations do not increase the fishing capacity of the vessel concerned. Those operations may be supported in accordance with Article 12.

Article 13 of the EMFAF introduces some exceptions to the ineligibility of expenditures that increase a vessel's fishing capacity. This issue is developed in Article 19, which states that increases in GT can be financed for safety, better working conditions, and better energy efficiency, if they do not increase fishing capacity (i.e. in this case, the harvesting capacity).

It is worth noting that Article 19 uses the term "fishing capacity," which appears inconsistent. While the term aligns with what can be increased, such as GT, it more accurately refers to characteristics that refer to a vessel's "harvesting capacity". Thus, the use of the term "fishing capacity" seems inconsistent. The EMFAF is an improvement on the EMFF in that it includes social considerations not part of the previous regulation, such as safety and working conditions. This improvement is needed to improve the attractiveness of the fishing fleet for the new generations of fishers and other crew, particularly when dealing with the problem of low generational replacement (see Box 2).

One factor limiting the adoption of new technologies and switching to new practices is the availability of capital (CAPEX) and the subsequent payback time (increased OPEX) in reduced fuel consumption (Alma Maris 2023, EP STOA decarbonisation 2023, ECORYS, 2023).

Another factor limiting adoption is likely to be the subsequent payback time in reduced fuel consumption. For larger changes, the EMFAF funding is also not fit to support and was not purposed for the investment for building new vessels or conversion to alternative fuels that would require different vessels, also because ineligibility criteria disqualify any attempt to increase the fishing capacity in terms of engine power while an increase in gross tonnage is permitted. EMFAF Regulation Article 18c and d "other vessels up to 24 metres in overall length, the new or modernised engine does not have more power in kW than that of the current engine and emits at least 20% less CO<sub>2</sub> compared to the current engine." Hence, EMFAF makes the funding of energy transition easier for vessels under 24m and would then not contribute to help segments > 24 m sufficiently. Eligibility criteria focusing on fleet capacity (GT, kW, length) may limit innovation, in an attempt to reduce the risk of increased fishing capacity that can come along (see Section 6). It is also assumed that larger vessels (>24 m) are more profitable and can reinvest their profit into the required change without the need for accessing public money support.

**Table 58 – Percentage of eligible vessel and 2023 capacity for the EMFAF funding, if the <24m criterion only would apply. In effect, a vessel should also belong to a segment that is not perceived as out of balance to be eligible, while such information is not accounted for in the table estimates**

| Country | Mean LOA | Mean Age | Sum kW  | Sum GT  | No Vessels | % Nb Ves Eligible | % KW Eligible | % GT Eligible |
|---------|----------|----------|---------|---------|------------|-------------------|---------------|---------------|
| BEL     | 22.3     | 36.6     | 5 723   | 2 236   | 26         | 43                | 13            | 16            |
| BGR     | 6.6      | 25.5     | 48 922  | 4 655   | 1 766      | 99                | 94            | 80            |
| CYP     | 7.2      | NaN      | 37 887  | 3 228   | 812        | 99                | 95            | 83            |
| DEU     | 8.4      | 36.9     | 64 140  | 10 954  | 1 100      | 96                | 51            | 19            |
| DNK     | 8.1      | 37.9     | 110 902 | 18 430  | 1 732      | 97                | 55            | 28            |
| ESP     | 9.1      | 38.0     | 355 177 | 72 615  | 7 897      | 92                | 47            | 23            |
| EST     | 5.5      | 25.9     | 23 545  | 2 960   | 2 010      | 99                | 48            | 18            |
| FIN     | 6.3      | 31.0     | 156 205 | 8 701   | 3 219      | 99                | 90            | 58            |
| FRA     | 9.0      | 30.2     | 743 477 | 66 356  | 5 817      | 97                | 81            | 42            |
| GRC     | 7.4      | 34.4     | 294 063 | 39 621  | 11 301     | 99                | 86            | 66            |
| HRV     | 6.5      | 42.5     | 284 133 | 26 271  | 7 217      | 99                | 84            | 63            |
| IRL     | 8.2      | 32.5     | 90 276  | 17 810  | 1 937      | 95                | 50            | 28            |
| ITA     | 9.4      | 39.3     | 797 517 | 101 373 | 11 951     | 98                | 84            | 69            |
| LTU     | 6.5      | 32.3     | 3 519   | 436     | 101        | 86                | 9             | 1             |
| LVA     | 5.5      | 36.2     | 7 504   | 1 188   | 624        | 94                | 19            | 5             |
| MLT     | 7.2      | 34.1     | 64 428  | 4 936   | 824        | 99                | 93            | 76            |
| NLD     | 12.4     | 36.3     | 69 910  | 13 632  | 568        | 74                | 28            | 14            |
| POL     | 9.4      | 36.4     | 44 672  | 8 322   | 777        | 94                | 53            | 23            |
| PRT     | 7.1      | 37.8     | 243 717 | 32 209  | 6 701      | 98                | 71            | 38            |
| ROU     | 8.8      | 21.7     | 5 794   | 1 406   | 172        | 99                | 91            | 86            |
| SVN     | 7.5      | NaN      | 8 760   | 668     | 136        | 100               | 100           | 100           |
| SWE     | 8.8      | 39.2     | 97 156  | 10 321  | 936        | 98                | 74            | 43            |

The EMFAF in the EU can grant financial compensation to fishers under specific conditions if they permanently cease their fishing activities. Buyback programmes, also called de-commissioning schemes, of fishing vessels have been widely used to reduce fishery overcapacity. Their effectiveness in achieving their intended objectives has been disputed, but equally, through effective design, successful programmes have been documented. A buyback programme is also one of the actions the Commission can approve when embedded in national plans deployed to fix imbalances reported by EU Member States (NSAC, 2022).

Hence, the EMFAF budget is considered very small for each nation under EMFAF to finance the energy transition (See Energy Transition Partnerships, the initiative led by DG MARE, and related workshops) <sup>(125)</sup>. The EMFAF also seeks to limit the risk of supporting further overcapacity and overfishing through ambivalent

<sup>(125)</sup> [https://fishreg.jrc.ec.europa.eu/documents/d/fishreg/2023-11-28\\_energy\\_transition\\_finance\\_workshop\\_report%20](https://fishreg.jrc.ec.europa.eu/documents/d/fishreg/2023-11-28_energy_transition_finance_workshop_report%20)

measures, and it therefore lacks flexibility in the eligibility criteria to access the funding. As a result, it was found that essential parts of the EU fleet are de facto excluded by the eligibility rules (an eligible vessel must be less than 24 m in length and must belong to a segment perceived as in balance) as described in an EP PECH Committee Study of 2024. It also appears from the same report that the fishing industry is underusing the opportunities to use EMFAF to arrange the transition of individual vessels, as shown by the low number of applicants to Article 18, and no application for Art 19 (as of July 2024).

However, underusing Article 18 or not using EMFAF Article 19 is likely the result of the precondition requiring the extra GT to come from removing prior capacity (Article 19d) or from the ineligibility given imbalanced fleets.

Besides, the 2021-2027 EMFAF has been proposed in 2024 to be cut by 105 million (see COM 2024 100 final 2024/0060), for the money to be redirected toward urgent needs (EU support to Ukraine).

Additional sources of funding besides the EMFAF should be used, including the European Regional Development Fund (ERDF, designed to strengthen economic, social and territorial cohesion in the European Union), Horizon Europe, Innovation Fund, state aid, and private investors as long as the fisheries sector would be attractive.

## References

- Alma Maris Consulting, & Oceana. (2023). A pathway to decarbonise the EU fisheries sector by 2050. <https://doi.org/10.5281/zenodo.7670976>
- EP STOA 2023. Decarbonising the fishing sector: Energy efficiency measures and alternative energy solutions for fishing vessels, Ziegler and Hornborg.
- EP PECH Committee report 2024. The future of the EU fishing fleet. First assessment of Member States' EMFAF programmes for 2021-27. Policy Department for Structural and Cohesion Policies. Directorate-General for Internal Policies. November 2024
- ECORYS 2024 "Techno-economic analysis for the energy transition of the EU fisheries and aquaculture sector" report
- European Union. (2021). Regulation (EU) 2021/1139 of the European Parliament and of the Council of 7 July 2021 establishing the European Maritime, Fisheries and Aquaculture Fund and amending Regulation (EU) 2017/1004.
- European Commission 2023 POSSIBILITIES AND EXAMPLES FOR ENERGY TRANSITION OF FISHING AND AQUACULTURE SECTORS <https://op.europa.eu/en/publication-detail/-/publication/23464c13-b1c0-11ed-8912-01aa75ed71a1>
- European Commission: Directorate-General for Maritime Affairs and Fisheries, *Guide on financing the green energy transition of fisheries and aquaculture – Supporting the energy transition in fisheries and aquaculture through EU funding opportunities under the 2021-2027 multiannual financial framework, NextGenerationEU and beyond*, Publications Office of the European Union, 2023, <https://data.europa.eu/doi/10.2771/377801>

- North Sea Advisory Council (NSAC). (2022). NSAC Advice Ref. 17-2122, NSAC Advice on decarbonisation of fishing fleet. <https://www.nsrac.org/latest-advice/> The '8th Environment Action programme' at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32022D0591>
- European Parliament (2023). Energy transition in the EU fisheries and aquaculture sector. Briefing document, European Parliamentary Research Service. June 2023, 3  
[p.\[https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/747916/EPRS\\\_BR I\\(2023\\)747916\\\_EN.pdf\]\(https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/747916/EPRS\_BR I\(2023\)747916\_EN.pdf\)](https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/747916/EPRS_BR I(2023)747916_EN.pdf)  
[https://webgate.ec.europa.eu/fleet-europa/stat\\_list\\_vr\\_en](https://webgate.ec.europa.eu/fleet-europa/stat_list_vr_en) Scientific Technical and Economic Committee for Fisheries (STECF) – Monitoring the Performance of the Common Fisheries Policy (STECF-Adhoc-24-01), GRAS, M., PIERUCCI, A., MANTOPOULOU PALOUKA, D., KUPSCHUS, S. and KONRAD, C. editor(s), Publications Office of the European Union, Luxembourg, 2024
- Skerritt, D.J., Arthur, R., Ebrahim, N., Le Brenne, V., Le Manach, F., Schuhbauer, A., Villasante, S., U Sumaila, R. U. 2020. A 20-year retrospective on the provision of fisheries subsidies in the European Union, *ICES Journal of Marine Science*, Volume 77, Issue 7-8: 2741–2752



## Getting in touch with the EU

### In person

All over the European Union there are hundreds of Europe Direct centres. You can find the address of the centre nearest you online ([european-union.europa.eu/contact-eu/meet-us\\_en](https://european-union.europa.eu/contact-eu/meet-us_en)).

### On the phone or in writing

Europe Direct is a service that answers your questions about the European Union. You can contact this service:

- by freephone: 00 800 6 7 8 9 10 11 (certain operators may charge for these calls),
- at the following standard number: +32 22999696,
- via the following form: [european-union.europa.eu/contact-eu/write-us\\_en](https://european-union.europa.eu/contact-eu/write-us_en).

## Finding information about the EU

### Online

Information about the European Union in all the official languages of the EU is available on the Europa website ([european-union.europa.eu](https://european-union.europa.eu)).

### EU publications

You can view or order EU publications at [op.europa.eu/en/publications](https://op.europa.eu/en/publications). Multiple copies of free publications can be obtained by contacting Europe Direct or your local documentation centre ([european-union.europa.eu/contact-eu/meet-us\\_en](https://european-union.europa.eu/contact-eu/meet-us_en)).

### EU law and related documents

For access to legal information from the EU, including all EU law since 1951 in all the official language versions, go to EUR-Lex ([eur-lex.europa.eu](https://eur-lex.europa.eu)).

### EU open data

The portal [data.europa.eu](https://data.europa.eu) provides access to open datasets from the EU institutions, bodies and agencies. These can be downloaded and reused for free, for both commercial and non-commercial purposes. The portal also provides access to a wealth of datasets from European countries.

