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COMMISSION STAFF WORKING DOCUMENT

Roadmap for the energy transition in EU fisheries

Accompanying the document

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

Vision 2040 for fisheries and aquaculture

{COM(2026) 701 final} - {SWD(2026) 750 final} - {SWD(2026) 751 final} - {SWD(2026) 753 final}

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Executive summary

The Communication (COM (2026) 701) on the Vision 2040 for fisheries and aquaculture outlines the future for a sustainable, viable and competitive fisheries and aquaculture sectors by 2040. It highlights two particular points of action to help achieve this ambition: i) reducing the sector's dependence on fossil fuels through the energy transition, and ii) strengthening fisheries external action. To support progress on these two points, the Vision includes a dedicated roadmap for the energy transition as well as a strategy on fisheries external action. The roadmap for the energy transition in fisheries and aquaculture aims to provide additional guidance to the European Union, its Member States and stakeholders on collectively setting a course for making this transition.

This staff working document (SWD) accompanies the Commission Communication on a Vision 2040 for fisheries and aquaculture and its roadmap for the energy transition in fisheries and aquaculture, which forms an integral pillar of the Vision 2040. It aims to provide the evidence and analysis underpinning the fisheries dimension of the roadmap and take stock of the extensive work done with fisheries stakeholders in drawing up the roadmap, in particular under the Energy Transition Partnership for EU fisheries and aquaculture.

The evidence provided in this SWD reaffirms that the EU fisheries sector continues to be highly dependent on fossil fuels. This causes parts of the fleet to be particularly vulnerable to fuel price changes and contributes to the emission of greenhouse gases. Making an energy transition is therefore both an economic and an environmental imperative.

On the basis of the extensive collaboration with stakeholders, as well as the results of several studies on the topic, six considerations emerge which are crucial for ensuring a fair, realistic and feasible energy transition in the sector. First, the energy transition requires a coordinated approach across different levels of governance (from EU to local action), as well as strong collaboration between sectors, in particular the maritime and waterborne sectors. Second, the energy transition must be achieved in full synergy with the other objectives of the common fisheries policy (CFP), in particular as regards progress on achieving fishing capacity balance. Third, the energy transition requires moving towards a stronger business model for fisheries that can enable private investment in a sustainable way. This is one of the key enablers for the transition and it is strongly linked to the broader challenges of modernising the fleet and making the sector more attractive. Fourth, the speed of the energy transition is bound by progress in the development of viable, net-zero technologies, shipyard capacity and port infrastructure. Strong alignment with the wider EU initiatives aimed at decarbonising the maritime sector is therefore crucial for achieving the energy transition in fisheries. Lastly, adequate consideration should be given to the fairness of the transition in the fisheries sector. This includes considering the impacts on coastal communities, balancing the costs and benefits of the transition, ensuring opportunities to develop workforce skills during the transition and ensuring an inclusive governance.

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1. Introduction

In February 2023, the European Commission adopted a Communication on the energy transition in EU fisheries and aquaculture[1] as part of the fisheries and oceans package[2]. In 2022, alarmed by the impact of rising energy prices on the profitability of the fisheries and aquaculture sectors, the Commission set the ambition for resilient and carbon-neutral sectors by 2050. This was to be achieved by steering the sectors towards an energy transition in line with the Commission's ambitions for climate neutrality and the Green Deal. The energy transition has the aim of reducing the sectors' costly vulnerability to fluctuating fossil fuel prices, while setting a course for their long-term decarbonisation.

The urgent need to reduce reliance on fossil fuels became clear once again in 2026, following the start of the war in Iran and the blockage of the Strait of Hormuz. Prices spiked for the fuel types that are most important for fisheries and aquaculture, in particular marine gas oil (MGO). This pushed many fishers and aquaculture operators into financial difficulty for the second time in the space of four years. In response, the Commission activated the temporary crisis mechanism under the European Maritime Fisheries and Aquaculture Fund (EMFAF) for the second time, as well as additional support measures allowing Member States to help the industry absorb the worst impacts of the crisis[3].

This shows once more that it is imperative, from both an economic and an environmental perspective, to break the dependence on fossil fuels through an energy transition in the fisheries and aquaculture sector, in order to ensure a resilient, competitive and sustainable future, in line with the Vision 2040 for fisheries and aquaculture.

The energy transition in the fisheries and aquaculture sectors cannot happen overnight but rather requires sustained effort. Rather than proposing quick fixes, the 2023 Communication proposed launching a new form of cooperation with stakeholders on the energy transition, namely an Energy Transition Partnership (ETP) for EU fisheries and aquaculture. The ETP offers an open platform for all stakeholders, facilitating cooperation, coordination and the sharing of knowledge.

With over 690 members[4], the ETP has enabled a unique, constructive and collaborative approach. As a concrete deliverable, the ETP supported and informed the development of the roadmap for the energy transition. An overview of the activities and progress made under the ETP, and other initiatives, is provided in Annex 2. This SWD provides the underlying analysis and considerations made for the roadmap for the energy transition in the EU fisheries sector, as set out in COM(2026) 701. A parallel SWD [SWD(2026)753] sets out a dedicated roadmap for the aquaculture sector.

As a key input to the roadmap, the ETP carried out extensive consultations with stakeholders and experts. These were consolidated into a set of 10 key considerations, as well as detailed recommendations by each of the 10 working groups of the ETP[5]. In addition, efforts by the European Parliament, advisory councils, Member States and sector initiatives have equally informed the roadmap. The recommendations and considerations were presented by the ETP stakeholders on 17 February 2026 at the conference on the energy transition in EU fisheries and

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1 COM(2023) 100 final on the energy transition in EU fisheries and aquaculture. The fisheries and oceans package included also the CFP Communication, CMO Report and the marine action plan.

2 Common fisheries policy (CFP) - Oceans and fisheries - European Commission.

3 Emergency funding to shield fisheries and aquaculture from Middle East crisis - EU Blue Economy Observatory.

4 In April 2026.

5 Joint Considerations of the ETP Support Groups on EU Fisheries and Aquaculture.

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aquaculture[6]. Besides, the Commission and national administrations have provided support for pilot and research projects, including with the European Parliament, of which the results are also reflected[7].

Energy transition comes at the same time that the EU, together with the Member States and stakeholders, is reflecting on a broader set of questions on the future of the fisheries and aquaculture sectors in the EU. The evaluation of the Regulation on the common fisheries policy ('CFP Regulation')[8] indicates that, despite progress in rebuilding commercial fish stocks towards the maximum sustainable yield, the sector continues to face several critical challenges, including an ageing fleet, lingering overcapacity and a weak profit base. This raises more fundamental questions about the future of the fisheries sector. The energy transition roadmap set out in this SWD is an integral pillar of the reflections in the Vision for 2040 and the future policy considerations on the CFP.

A clear, sector-specific long-term roadmap setting out priorities in the different phases of the transition can reduce policy uncertainty for stakeholders. It facilitates coordination among shipyards, ports, fuel suppliers and fishers, as key stakeholders in the transition. In short, the roadmap aims to serve three main objectives.

1) Make the energy transition an integral part of the Vision for 2040 on the future of the fisheries and aquaculture sectors in the EU.
2) Set out a realistic and feasible pathway for the energy transition towards 2050 with several intermediary milestones.
3) Develop a common understanding and coordinated approach across stakeholders on the crucial steps, aiming for collective ownership of the actions and enablers for implementing such a transition. This in turn will provide a clear policy direction and guidance for investment in the energy transition.

This document is divided into four chapters that aim to describe the reasoning behind the energy transition roadmap presented in COM(2026)701 on the Vision 2040 for fisheries and aquaculture. Chapter 2 analyses the data used to determine the starting point for the transition. Chapter 3 highlights the six main considerations for the energy transition, which underpin the choices made in designing the roadmap and which are based on the complex work with stakeholders, as well as the results of various studies and projects. Annex 1 includes a short overview of the progress made with stakeholders since 2023. Annex 2 includes the joint considerations and sectoral recommendations made by the ETP and its working groups.

Energy transition in the Vision 2040 for fisheries and aquaculture

Energy transition is one of the key pillars of the transition towards the overarching Vision 2040 for fisheries and aquaculture. The energy transition roadmap is therefore not a stand-alone initiative but has been developed in order to be fully aligned with the broader objectives set out in the Vision. This has several implications.

First, fisheries are likely to be profoundly affected by: i) ongoing technological progress, ii) the inevitable and increasing effects of climate change on the marine environment, iii) biodiversity loss and pollution, iv) demographic changes and v) the development of EU coastal communities[9], among other things. When developing a roadmap for the energy transition in

6 Navigating Change: Towards the Energy Transition in the EU Fisheries and Aquaculture - European Commission.

7 Including through the European Maritime, Fisheries and Aquaculture Fund (EMFAF) and Horizon Europe.

8 Register of Commission Documents - SWD(2026)120.

9 COM(2026) 530 final.

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fisheries and aquaculture towards 2050, the goal is therefore not the transition of today's sector, but shaping the pathway towards a carbon-neutral, profitable and low-impact sector for the decades ahead.

Second, the full **recovery of fish stocks and a healthy marine environment are the true fundamental pillars** for the future of the EU fisheries sector, including for the energy transition. Healthier and more productive stocks strengthen the basis for economic performance in fisheries and support the decrease in energy intensity, which in turn enables investment, including in the energy transition.

Third, the **energy transition should anticipate that the EU fishing fleet will look different in the future than it does today**. The Vision for 2040 recognises that, in order to move to a more productive and viable fleet, EU fisheries will need to operate even more in balance with marine ecosystems. There will likely be fewer, newer and more efficient vessels in the future in order to remain competitive and operative in a viable business model.

It is thus crucial that the energy transition roadmap takes a holistic approach to the transition towards a low-impact, viable fleet, in line with the Vision for 2040, of which energy transition is just one dimension. Synergies with other EU fisheries policy objectives should be considered carefully in this roadmap, while acknowledging that the outcomes of parallel processes, such as the ongoing negotiations on the future of EU funding, are unknown. This is discussed in Chapter 3.

2. Baseline: a short analysis of the energy transition in fisheries

Before setting out a pathway for the energy transition towards 2050, it is important to better understand the main sources of emissions and vulnerabilities in the fisheries sector. The presented graphs and findings in this chapter are based on the socio-economic data collected under the EU's data collection framework (DCF)[10], as well as the two dedicated studies[11,12].

Finding #1: Total fossil fuel consumption has reduced, but this is also caused by a reduction in fishing effort.

The EU fishing fleet remains highly dependent on fossil fuels as a main source of energy for propulsion and on-board operations. In 2023, the EU fleet consumed approximately 1.564 billion litres of fossil fuel[13]: by far the majority being Marine Gas Oil (MGO). At the same time, the overall fuel consumption of the EU fleet is part of a long-standing reducing trend, with a decline of 28% since 2008.

The large-scale fleet, responsible for 75% of total emissions in 2022, saw a 45% reduction in fuel consumption since 2005.[14] The small-scale fleet also almost halved its emissions over the same period, representing 8% of total emissions in 2022, while landings were about 7% of the

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10 Home - Data Collection Framework - DCF - European Commission.

11 European Commission: European Climate, Infrastructure and Environment Executive Agency, ECORYS, SML, BlueFarm and CE Delft, *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**.

12 European Commission: Directorate-General for Maritime Affairs and Fisheries, CE Delft, Ramboll, Scholten, P., Hindriks, I. et al., *Study on greenhouse gas emission (GHG) reduction costs, scenarios and pathways for EU fisheries to achieve net zero by 2050*, Publications Office of the European Union, 2026, **https://data.europa.eu/doi/10.2771/3293497**.

13 On the basis of data collected under the EU data collection framework (DCF).

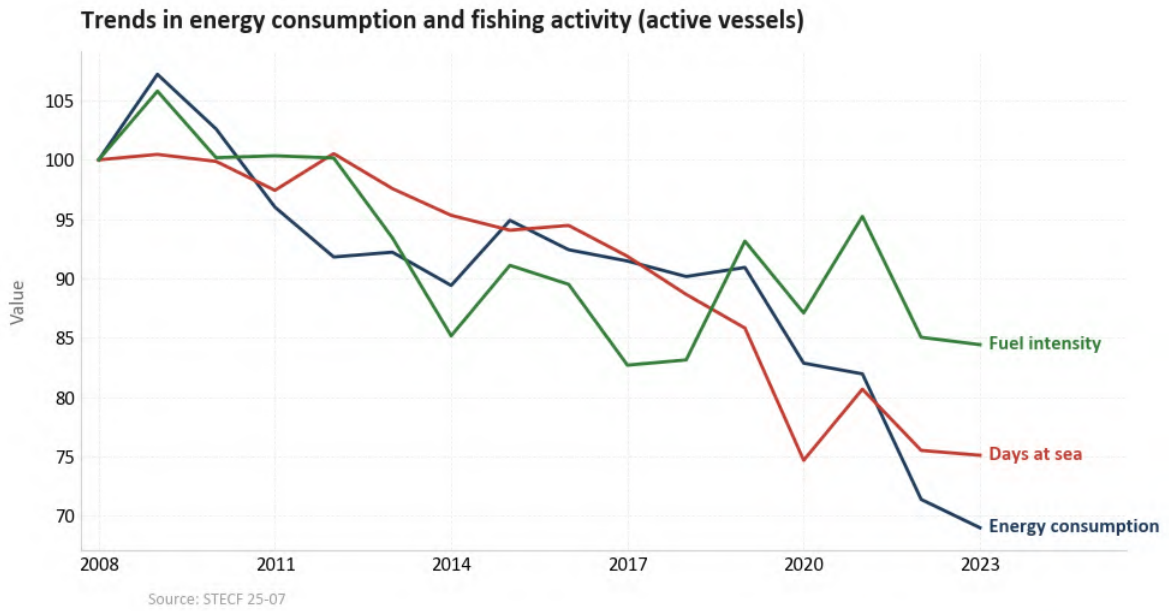
14 i.e. the reference year for the EU Effort Sharing Regulation (ESR), under which fisheries' emissions are covered.

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EU total. The distant water fleet increased its baseline emissions by roughly 22% between 2005 and 2022, and accounted for about 17% of total fisheries emissions by the end of the period.

At EU level, this reduction can partly be attributed to the progress made on energy efficiency in the fleet, such as by adopting modern gear, energy-efficient on-board equipment and engines, stock recovery, and possibly changes in the composition of landings and structure of the fleet. This has led to an overall reduction of about 15% of emissions per tonne of landings. However, as shown in **Figure 1**, fleet fuel consumption also correlates strongly with fishing activity indicators, such as the number of fishing days, which ultimately lead back to available fishing opportunities. This suggests that a significant part of the emission reductions achieved is driven by a reduction in fishing activity, rather than progress on increasing energy efficiency.

Figure 1 – Trends in energy consumption, fishing effort (days at sea) and fuel intensity (litres of fuel per tonne of landings). (2008=100) (AER, 2025)[15]

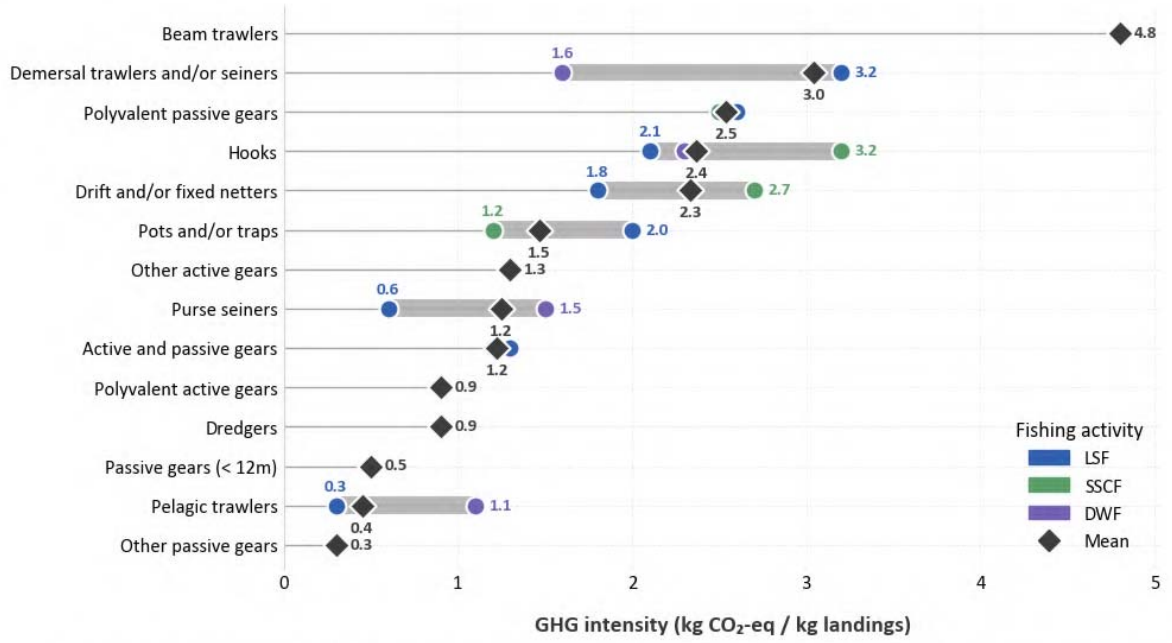


Finding #2: Energy use per kg of landings is highly diverse across different fleet segments.

As explained in Finding 1, the energy transition aims to reduce both the vulnerability of fisheries products to fuel prices, and their carbon footprint. It is therefore useful to consider not only the total emissions, but also the greenhouse gas (GHG) footprint per unit of landed product. **Figure 2** shows the GHG emissions per fishing technique and fleet category[16]. It shows that there is a high diversity of energy and carbon intensity in landings across different parts of the EU fishing fleet. Both the small-scale and large-scale fleets have energy-intensive and non-energy-intensive sectors, in terms of their direct emissions. In fact, both highly energy-efficient fishing methods, for example pelagic trawling, and the least efficient methods, namely beam trawling, are in the large-scale fisheries (LSF). The carbon intensity of the techniques used within the small-scale coastal fisheries (SSCF) also varies greatly. All parts of the fleet are therefore responsible for the energy transition, requiring an inclusive approach while taking into account also their specific challenges and opportunities while making the energy transition.

[15] Data collected under the 2025 Annual Economic Report of the EU fishing fleet (AER) data call of the DCF.
[16] i.e. Large-scale fisheries (LSF), distant water fleet (DWF) and small-scale coastal fisheries (SSCF).

Figure 2 – CO_2-equivalent emissions per kilogram of landings by fishing technique

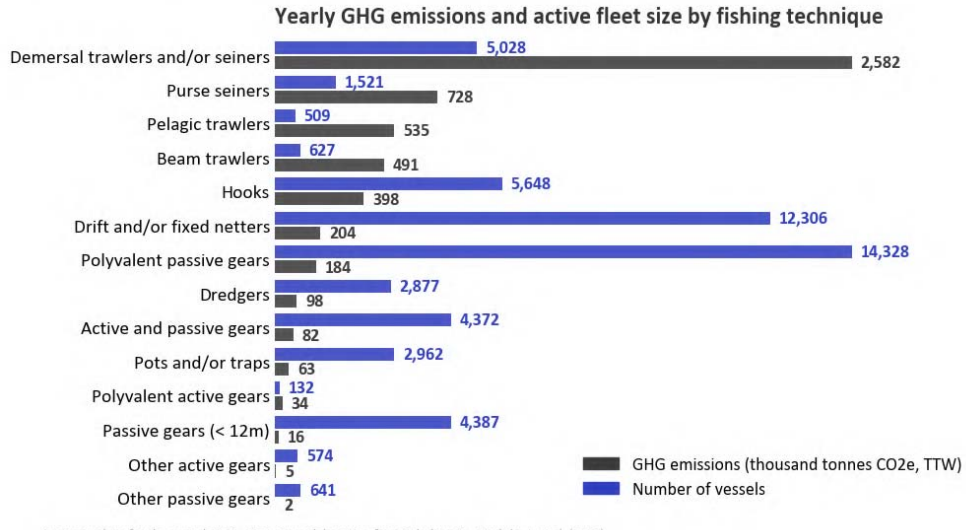


Average values for the period 2018–2022. Own elaboration from Scholten, P., Hindriks, I. et al., Study on greenhouse gas emission (GHG) reduction costs, scenarios and pathways for EU fisheries to achieve net zero by 2050 (2026)

Finding #3: Direct emissions from fisheries are concentrated in a small number of energy-intensive fleet segments.

Despite differing levels of emissions per unit of landings, overall emissions remain significantly concentrated in relatively small subsets of the sector – in particular the energy-intensive parts of the large-scale fleet. Figure 3 shows the concentration of emissions across different parts of the fishing fleet. Demersal trawlers and seiners, and the beam trawl segments in particular have a high total emissions and high energy costs. Combined, they account for around 60% of total emissions, while also accounting for 40% of landings value and making up 10% of active vessels in the EU fishing fleet.

Figure 3 Annual total greenhouse gas emissions in CO_2-equivalents and number of vessels.



Average values for the period 2018–2022. Own elaboration from Scholten, P., Hindriks, I. et al. (2026)

Finding #4: The large-scale fleet is especially vulnerable to fuel price hikes.

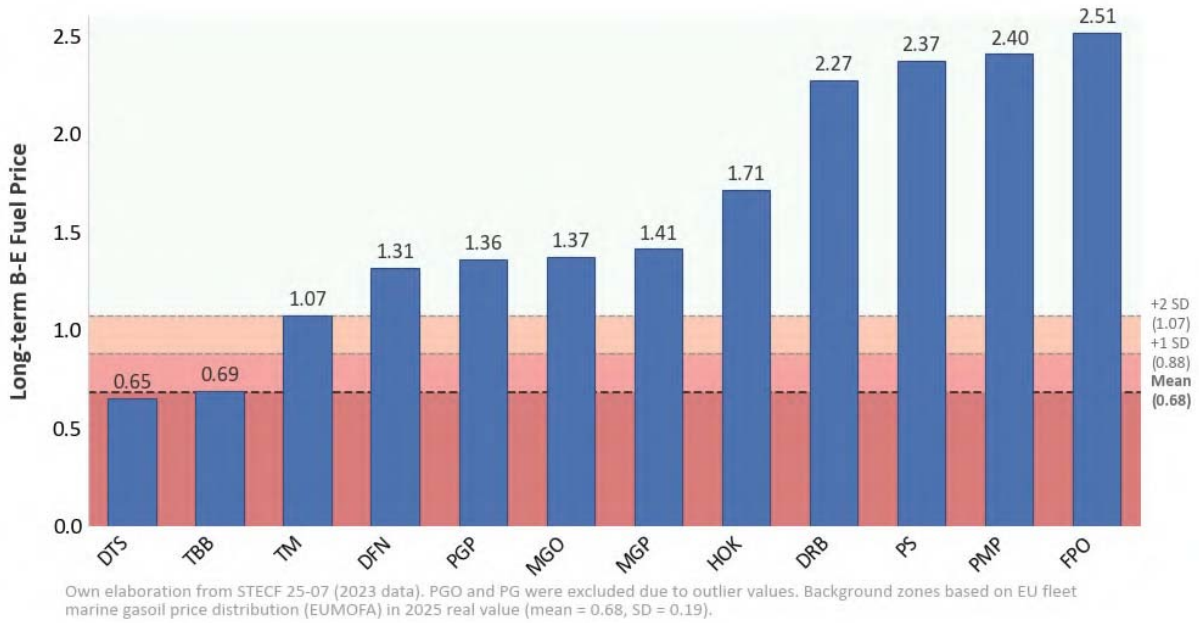
Large fluctuations in fossil fuel prices over the last five years, as well as the increasingly unpredictable geopolitical environment affecting global oil markets, have further underlined the need for the transition.

The sensitivity of different parts of the sector to fuel prices can be assessed by looking at their long-term break-even fuel price. The long-term break-even fuel price is the fuel price at which a fisher no longer makes an operational profit[17]. For example, if the long-term break-even price is EUR 1.50 per litre, it means that, at this price, fuel costs would be at a level that yields zero operational profits, assuming everything else stays the same. A low break-even fuel price thus implies that a small increase in fuel price from the average would result in losses for that fleet.

Figure 4 shows that demersal trawlers and seiners, and beam trawlers (and to a lesser extent pelagic trawlers) are by far the most sensitive to fuel price fluctuations. Their real break-even fuel prices of EUR 0.68 and EUR 0.73, respectively, are the lowest among the EU fleet, meaning that these are the first to suffer losses when fuel prices increase. Put differently, even a minor increase above the historic average real fuel price could render this part of the fleet unviable in the long run. These three segments together represent about half of the value of landings of EU fisheries. Note that these figures are in real terms and represent averages, and that there may thus be substantial variation between individual vessels using the same fishing techniques. Besides, even if segments are not likely to make losses as a result of fuel price increases, the socio-economic impacts can still be significant when returns from fisheries reduce.

Figure 4 thus highlights that the energy transition is not only a long-term consideration, but that there is an urgent short-term need to reduce vulnerability to fossil fuel price fluctuations by strengthening profit margins and increasing fuel intensity.

Figure 4 – Long-term break-even fuel price by fishing technique, and mean and distribution of EU marine gas oil (MGO) price



Abbreviations used: DTS = Demersal trawlers and/or demersal seiners; TBB = Beam trawlers; TM = Pelagic trawlers; DFN = Drift and/or fixed netters; PGP = Vessels using polyvalent passive gears only; MGO = Vessels using other active gears; MGP = Vessels using polyvalent; HOK = Vessels using hooks; DRB = Dredgers; PS =

[17] i.e. the gross profits minus the depreciation of assets.

Purse seiners; active gears only; PMP = Vessels using active and passive gears; FPO = Vessels using pots and/or traps.[18]

Box 1: Considerations on the indirect emissions of the fisheries sector.

A subject of debate has been how to consider the indirect emissions stemming from the fisheries sector, other than those from fossil fuels. The focus of discussions has been on strengthening the resilience of the sector in the wake of the energy price shock of 2022, as well as on the need to align with the wider energy transition of the EU's economy. The efforts of the ETP have primarily focused on reducing the sector's dependence on fossil fuels, i.e. emissions from the burning of fossil fuels by fishing vessels. However, the Vision 2040, of which this roadmap is part, takes a holistic approach to the future role of fisheries and aquaculture in the EU. This raises questions about how to consider possible indirect emissions in the context of the sector's transition towards 2050.

Beyond the direct emissions from fossil fuels combustion, the indirect emissions of the fisheries sector are linked, among other things, to transportation of crew, electricity use in port, production of physical capital, waste and consumables. And there is a considerable amount of ongoing scientific research focused on better understanding other possible impacts that fisheries could have on the potential for ocean carbon sequestration. This research includes the effect of removing biomass that contribute to the ocean carbon flux, the reduction of living biomass that stores carbon and the disturbance of the seabed sediments by benthic trawling. Research on the latter subject (i.e. sediment disturbance leading to carbon release) was prompted by recent publications. The results of these strands of research could require consideration for the future when clearer evidence is available.

3. Considerations on a realistic, affordable and fair transition

Chapter 2 provided quantitative insights into the baseline sources of emissions and the vulnerability of the sector. Looking forward, a complex set of social, economic and technical considerations, as well as important normative and political considerations, must be made when drawing up a feasible roadmap, as done in the Vision Communication.

This chapter aims to provide evidence and reflections on some of the key strategic, political, technical and economic considerations for the transition. These considerations aim to underpin the choices made when drawing up the energy transition roadmap as set out in the Communication on the Vision 2040 for fisheries and aquaculture. The joint considerations prepared by the ETP, and the recommendations delivered by its 10 dedicated working groups, informed these considerations[19]. In addition, insights from various studies[20] were also used. These analysed the technological and economic feasibility of the transition, such as economic viability of technologies, projected fuel availability and the relative costs of different emission reduction pathways.

3.1. Modelling projections for the energy transition in EU fisheries

In 2025, the Commission procured a modelling study on a set of alternative pathways for the energy transition in the fisheries sector, to help develop the energy transition roadmap. This

[18] Note that this graph is made on the basis of average historic fuel price of MGO (EUMOFA) in the period 2015-2025. It should be noted that the SSCF, at least in some MSs, may buy fuel at higher prices, or used other types of fuels such as gasoline, this may, in overestimate their ability to cope with fuel prices.

[19] ETP Support Group - Maritime Forum - European Commission.

[20] Study on greenhouse gas emission (GHG) reduction costs, scenarios and pathways for EU fisheries to achieve net zero by 2050 - Publications Office of the EU.

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modelling study builds on the results of an earlier techno-economic study on the energy transition, which assessed the technical and economic feasibility of different technologies for the energy transition.

This modelling exercise allows the different aspects of the transition to be linked together in a coherent way. It allows different scenarios to be tested and compared, ballpark estimates of the costs of the transition to be made, and the key bottlenecks that hamper the transition to be identified. This also helps to identify more clearly where collective actions and efforts could be focused, while also giving an idea of which technologies are technically and economically most feasible for driving the transition in the future. While recognising the limitations of modelling approaches, which always involve simplifying a complex reality, the study models five alternative scenarios on the basis of different assumptions, policy measures and market environments for making the transition in the sector. The authors of the study came to the following conclusions.

- Adopting quick-gains measures for energy efficiency is the most effective and economic way to reduce both costs and emissions and step up resilience in the short run. Policy measures should focus especially on this in the short run.
- Fleet renewal is one of the key enablers for the energy transition. However, the current socio-economic situation in the fleet, the availability of infrastructure, the accessibility of alternative fuels and the capacity of shipbuilders are major barriers that need to be addressed.
- The transition to alternative fuels will likely happen only later in the transition, as fuel prices fall and the availability of fuels and fuelling infrastructure improves. An important policy consideration is how to overcome the price gap between conventional and alternative fuels.
- Infrastructure is a crucial enabler that requires planned effort with other stakeholders, including port authorities and the maritime sectors.

The results of the study, while taking into account its limitations, helped to inform the roadmap. Further details and results can be read in the published study[20].

3.2. Considerations for developing the roadmap

Consideration 1: *Progress on the energy transition can only be achieved through a coordinated and multi-level governance approach.*

Achieving the energy transition in the fisheries sector is a highly complex endeavour, both from an economic, technical and governance perspective, and in light of the increasing impacts of climate change. A coordinated approach is needed due to the diversity of the fleet, the structure of the sector and the fact that competence is spread across different levels of governance, different sectors and a wide range of stakeholders, amongst others.

Need for a regional and tailored approach

The EU fishing fleet is diverse, in terms of vessel types and sizes, target species, gear use, trip length, management practices and local contexts. This means that, depending on the Member State, **tailored national, regional and/or local strategies will be needed for making the transition**. Examples of such strategies are emerging throughout the EU. By aligning these national, regional and local approaches to the fishing fleet with the possibilities under EMFAF and the future multiannual financial framework (MFF)[21] programming, Member States have

[21] https://commission.europa.eu/strategy-and-policy/eu-budget/long-term-eu-budget/eu-budget-2028-2034_en.

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the opportunity to promote selective low-impact fishing practices and energy-efficient practices and facilitate a just transition that preserves coastal livelihoods and increases competitiveness.

Cross-sector coordination

Furthermore, the transition requires strong cooperation across different sectors. The energy transition requires close coordination between stakeholders such as fishers, port authorities, energy providers and shipyards, in order to overcome fundamental market coordination problems. As in other sectors, stakeholders in the fisheries and surrounding maritime sectors often face information asymmetries or they risk coordination failures[22] that hinder the energy transition. These gaps lead to hesitation and postponed investments, while misaligned economic incentives and planning horizons create vicious cycles, such as ports delaying bunkering capacity without guaranteed demand, and shipowners avoiding orders for vessels dependent on unavailable fuels. The EU ports strategy refers to some of these challenges, and some flagship actions for the way forward, in the measures under the European Grids Package[23].

In terms of innovation and technology development, the fisheries sector can benefit from cross-innovation in other maritime sectors, such as the waterborne transport sector. This is especially relevant given that, due to its size and structure, parts of the sector have a lower capacity to drive fundamental technological development, such as future propulsion technology, and will therefore need to benefit from solutions, infrastructure and innovations in the wider maritime cluster.

Lastly, coordination across the value chain, from harvesting to processing, logistics and marketing, is essential to ensure that there is a comprehensive approach to decarbonisation efforts on fisheries and aquaculture products. In this context, multi-stakeholder governance and multi-level governance are crucial enablers for the energy transition in the sector.

Consideration 2: *Progress on the energy transition should be achieved in synergy with other objectives of the CFP.*

The energy transition is only one of the pillars of the transition towards a viable, resilient and low-impact EU fishing fleet, as set out in the Vision. The approach and actions put forward in the roadmap should therefore be addressed holistically and, as far as possible, seek synergies with other EU fisheries policy objectives, such as reducing environmental impacts, supporting the transition towards a viable business model and improving working conditions and safety on board.

An important aspect in that regard is the balance between EU fishing capacity and available resources. Historically, imbalances between the capacity of the EU fishing fleet and available resources have played an important role in the overexploitation of resources, and they undermine the socio-economic performance of the sector[24]. In order to prevent this, the CFP Regulation provides measures and safeguards aimed at preventing overcapacity, notably the measures laid down in Articles 22 to 24[25]. The total capacity of the EU fishing fleet is capped

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22 European Commission: Directorate-General for Maritime Affairs and Fisheries, CE Delft, Ramboll, Scholten, P., Hindriks, I. et al., *Study on greenhouse gas emission (GHG) reduction costs, scenarios and pathways for EU fisheries to achieve net zero by 2050*, Publications Office of the European Union, 2026, https://data.europa.eu/doi/10.2771/3293497.

23 COM/2025/1005 European Grids Package

24 European Union's fishing fleet - Publications Office of the EU

25 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

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by national ceilings to prevent excessive fishing capacity and reduce pressure on limited fish stocks. As highlighted in the 2026 evaluation of the CFP Regulation[26], overcapacity persists within the EU, and ensuring capacity balance remains a core challenge for EU fisheries to date.

However, stakeholders, including those under the ETP, are concerned that the existing rules on fishing capacity might limit the possibility for the industry to adjust to new challenges, including the energy transition. Alternative fuels and batteries often require more space and are heavier, which may in some cases take up more space on board at the expense of, for example, storage capacity. At the same time, most stakeholders acknowledge that capacity control remains crucial for conservation and economic performance.

As highlighted in the latest comprehensive study on the EU fishing fleet[24], a challenge for the EU fleet policy within the CFP is thus to ensure the transition towards cleaner propulsion systems, improved working conditions and greater crew comfort, without increasing the ability to catch fish, as capacity imbalances are already occurring in a high number of fleet segments. As highlighted in the Vision, climate change and environmental factors other than fishing may further exacerbate these imbalances.

The study concludes, among other things, that Member States' fishing capacities currently remain below their capacity ceilings and are therefore in most cases not limited by those ceilings, at fleet level. The study also reaffirms earlier findings that there are multiple technological solutions for improving energy efficiency, to reduce the energy dependence and carbon footprint of the fishing fleet. These solutions do not typically involve more GT/kW. Minimising energy use by implementing 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.

The CFP already allows new fishing vessels to be built with private money, within the safeguards laid down therein to prevent the fleet's total fishing capacity from increasing. Achieving 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 study also explores alternative capacity management systems in non-EU countries and provides a set of proposed measures and recommendations to effectively address and reallocate fishing capacity across fleet segments.

Related to the same issue, public support that stimulates or incentivises increases in fleet capacity undermines the long-term environmental and economic sustainability of fisheries. Therefore, current public support under EMFAF and State aid frameworks restricts investments that increase fishing capacity for fleet segments that are out of balance. EMFAF supports the energy transition of the fleet, reduction of overcapacity, modernisation, particularly for small-scale fleets and aquaculture, and data collection, and may compensate for temporary or permanent cessation. The Commission has recently proposed an amendment to the EMFAF Regulation aimed to simplifying the applicable requirements in order to facilitate funding for the energy transition in the fisheries and aquaculture sectors, while preventing harmful impacts.

Similarly, the transition towards low-carbon technologies and fishing techniques can in some cases provide trade-offs with other dimensions of environmental or economic sustainability, such as the impact on sensitive species, selectivity and the capacity to provide substantial

repealing Council Regulations (EC) No 2371/2002 and (EC) No 639/2004 and Council Decision 2004/585/EC (OJ L 354, 28.12.2013, p. 22, ELI: http://data.europa.eu/eli/reg/2013/1380/oj).

26 Register of Commission Documents.

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landing amounts. Technological advancements therefore require an integrated assessment of their potential impacts, extending beyond the energy transition aspect.

Consideration 3: *Financing the energy transition in the long run requires a stronger business model for fisheries.*

The energy transition, as part of the wider transition of the EU fishing fleet, will require substantial investments in vessels, gears, port and fuel infrastructure, skills, research and innovation, amongst other things. In order to finance such a transition, a strong business model is required that can support such investment into the future.

As underlined also in the recently published 'Evaluation of the CFP Regulation'[27], the profitability and returns on investment in the fisheries sector have been relatively low on average, especially in the last 5 to 10 years. As reported in the evaluation, in 2022 and 2023, the returns on investment in the fisheries sector were estimated at around 5%. This provides also an economic explanation for why substantial parts of the fleet have seen low private investment, and fleet renewal has been limited in most parts of the fleet. The lack of private investment and low fleet renewal are linked to a simultaneous increase in the average age of vessels (Figure 5) and a strong decline in the entry of new vessels over the last 15 to 20 years (Figure 6).

As highlighted also in the joint considerations of the ETP, heavy retrofits, on vessels that are nearing the end of their technical or economic lifetime, are expected to offer limited long-term benefits and are relatively less cost-effective compared to investing in modernisation. Substantial advancements in energy-efficient vessel design, propulsion, safety and innovative gears are more likely to be achieved on modern vessels than by retrofitting older vessels. Results reported from state-of-the-art modern fishing vessels gathered in the online compendium of the ETP point to reductions in energy consumption of roughly 25-60%, underlining the potential for the energy transition in modern vessels[28].

The Vision for 2040 therefore highlights that it is crucial to strengthen the business model for EU fisheries to support the socio-economic objectives of the CFP and the modernisation and energy transition in the sector.

27 SWD(2026) 120 final.

28 3. Fishing and aquaculture vessels with alternative power sources - Maritime Forum.

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Figure 5 – Fleet size and average vessel age (DG MARE analysis based on DCF data)

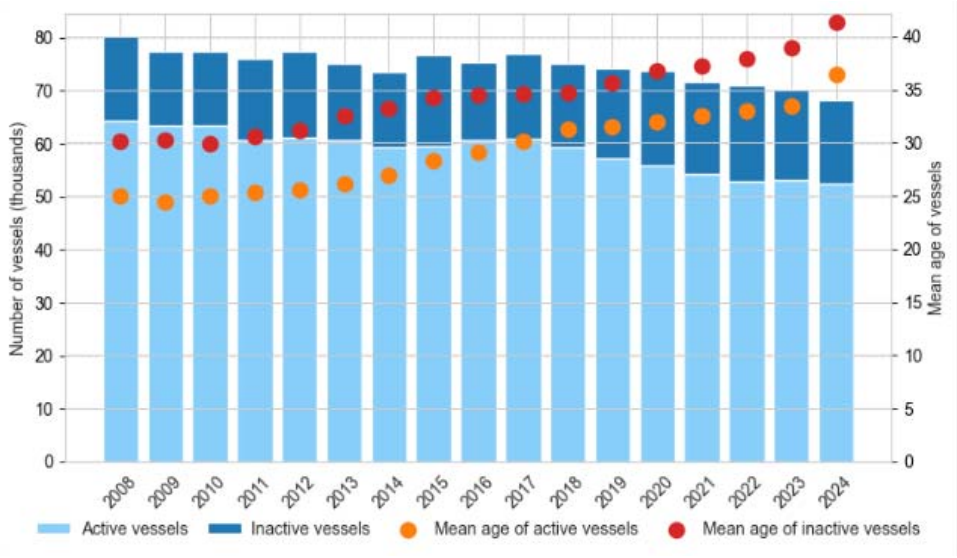
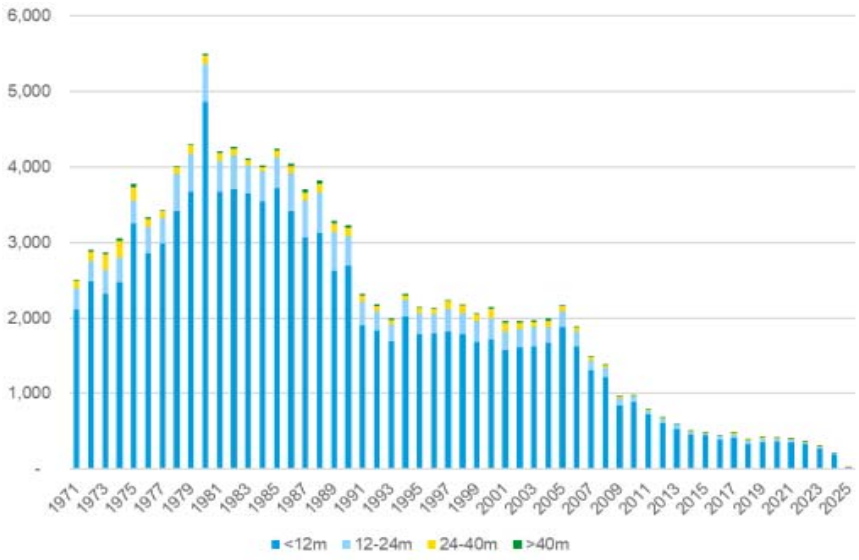


Figure 6 – Number of vessels by construction year (European Commission, 202622).



The Vision for 2040 highlights the need for a stronger economic performance of the fishing fleets, by restoring capacity balance for fisheries and understanding that profitability may be driven by several interlinked root causes, some of which were also highlighted in the evaluation of the CFP Regulation.

First, despite substantial progress over the last two decades in sustainable fisheries management and reducing of fishing pressure, **overexploitation of resources** and poor environmental conditions in some sea basins can compromise environmental objectives and can lead to substantial forgone incomes for fisheries[29]. Besides, more predictable fishing opportunities through healthier stocks can reduce risks. The prospects for higher future incomes, as well as lower income uncertainty could give a new impulse to sustainable private investment in the sector.

[29] Sustainability now or later? Estimating the benefits of pathways to maximum sustainable yield for EU Northeast Atlantic fisheries - ScienceDirect.

Second, **overcapacity of the sector** in relation to the available stocks means that the productivity of the sector is low, at the cost of competitiveness, resilience and profitability. In other words, there are 'too many vessels for too few fish', which increases the average costs of landings, as the maintenance, capital and crew costs are higher per tonne of landings. This is partly driven by historic subsidies and management approaches that incentivise overcapitalisation. Rebalancing capacity with the available fishing opportunities is one of the ways to improve the profitability of the fisheries sector and thus also the conditions for investment[30].

Third, a **lack of collateral** to make bankable investments in the sector can hamper private investment. The investment costs needed, e.g. for the acquisition of a new large-scale vessel, are high, often several million euro. Such an investment is only bankable if there are i) predictable prospect returns and ii) an underlying recovery value if an investment fails. This is especially important as the vast majority of EU fishing vessels are owned individually or by small enterprises. Moreover, recovery value also depends on a liquid market for second-hand vessels.

In 2024, the European Investment Bank (EIB) noted that investment in the sector's sustainability remained limited, in particular because investment amounts in the fisheries sector are relatively small and fragmented, which can be unattractive for the current investment models, and strong safeguards are required to avoid financing that unintentionally increases fishing pressure[31]. The Commission is working with the EIB to identify if and how the fisheries sector can best be served towards the future.

Consideration 4**:** *The speed of the energy transition in fisheries is bound by progress on developing viable net-zero technologies and fuels, shipyard production capacity and port infrastructure.*

There are several external factors constraining progress on the energy transition, in particular the development of technologies, the availability of fuels, port infrastructure and industrial capacity. Broader development in these areas will determine the capacity of the sector to transition. The transition of the sector in these areas needs to be strongly aligned with the EU's agenda for wider decarbonisation of the maritime sector and ports.

Development in feasible net-zero technologies

Not all technologies for the transition are sufficiently mature to provide viable alternatives for the transition across all parts of the fleet. The techno-economic analysis[32] on solutions available for the energy transition in the EU fisheries and aquaculture sectors concluded that, although numerous promising technologies for the energy transition are being developed, a part of the needed technologies are not yet technically or economically viable, or are not proven in practice and are therefore currently not widely adopted in the sector.

Currently, existing solutions that are known to be technically and financially viable are concentrated in gear innovations, such as novel trawling gears that reduce energy consumption, or quick wins such as the application of antifouling, the adjustment of steaming operations and

30 Bastardie F, Wakeford RC, Torreele E, Aranda M, Doering R, Ligas A, Mele I, Castresana J, Gabiña G, Maes SM, Sabatella R and Malvarosa L (2026) How to ensure sustainable fisheries while renewing the EU fishing fleet for modernisation and energy transition?. Front. Mar. Sci. 13:1812898. doi: 10.3389/fmars.2026.1812898.

31 Finance Earth & European Investment Bank, 2024.

32 De Vet, J. M., Gardner, H., Sala Pérez, M., Matheus, D., Mirambell Huguet, M., Bessin, A., Reyes, M., Pastres, R., Herpers, F., Nelissen, D., de Gelder, E., van Seeters, D. and Raphaël, S., Technoeconomic analysis for the energy transition of the EU fisheries and aquaculture sector, Publications Office of the European Union, 2024, doi:10.2926/425550.

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the performance of energy audits. The prevailing level of conventional energy prices also strongly influences how affordable alternative options appear.

It is therefore clear that **substantial efforts are still needed to develop, to higher technology readiness levels, the technologies that will allow an economically and technologically viable energy transition in the sector** in the medium to long run. This requires stepping up fundamental research on new technologies, enabling real-life testing and experimentation with new innovations, and increasing efforts to close the persistent price gap between conventional and low-carbon technologies. The energy transition roadmap therefore emphasises the need to quickly adopt existing energy efficiency solutions to reduce vulnerabilities and operational costs, while at the same time progressing on technology developments.

Availability of alternative fuels and port infrastructure

The widespread **availability and timing of alternative fuels** is a crucial enabler for energy transition in the sector, not just for fisheries but for the wider maritime sector. However, the availability and affordability of fuels are currently projected to remain limited over the short to medium run. The large-scale, affordable supply of alternative fuels, such as advanced biofuels, e-fuels, hydrogen and ammonia, is not expected to ramp up until later in the transition period, as they are needed to serve the energy transition in many other (maritime) sectors. This may also cause port and grid infrastructure in fishing ports to lag behind larger shipping ports. Fisheries therefore risks being a relatively late-served market, delaying its switch to alternative fuels. **It is therefore crucial that the fisheries sector is well integrated into the EU's wider initiatives aimed at decarbonising the maritime sectors**.

While a multi-fuel approach ensures flexibility and resilience, uncertain demand for fuels delays investment. It is therefore important to match these two market forces. The Commission will consider in the context of the Energy Union Package, how to promote the availability of sustainable fuels in ports. The revision of the Alternative Fuels Infrastructure Regulation (AFIR)[33] will consider measures to accelerate the deployment of alternative fuels infrastructure for shipping. In parallel, in context of the post 2030 energy framework the Commission will assess how renewable and low-carbon fuel supply at ports could be harmonised across the EU aiming at avoiding discrepancies and distortion of competition within the EU internal market.

Local electricity grids, safety rules and spatial planning often need reinforcement or redesign before charging or bunkering of alternative fuels is possible. The European Grids Package and the Guidance on efficient and timely grid connections[34] will speed up connections to the grid for viable projects, including in ports of all sizes.

At the same time, efforts are ongoing to accelerate the energy transition in the maritime transport sector, including investments in the availability of renewable and low carbon fuels, including through the sustainable transport investment plan (STIP)[35] and the latest ETS review proposal.[36] The STIP estimates that decarbonising the inland waterways and fisheries sectors will require 3.1 Mt of sustainable maritime fuels in addition to the 20 Mt of waterborne transport needs by 2035. Although these initiative do not directly target the fisheries sector, they do support the needed investments in availability and affordability of alternatives fuels which in the long-term also serve the energy transition in the fisheries sector.

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33 Regulation (EU) 2023/1804

34 COM/2025/1005 European Grids Package

35 COM(2025) 664 final

36 EUR-Lex - 52026PC0616 - EN - EUR-Lex and the proposed Sustainable Maritime Alternative Propulsion (SMAP) mechanism

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Ports are critical hubs for enabling the energy transition in the fisheries sector, not only for developing the right infrastructure but also for creating clean energy ecosystems, renewable energy generation, storage and the deployment of innovative solutions and testing. The EU ports strategy, launched by the Commission in 2026, highlights ports as becoming strategic energy hubs and 'multi-fuel production and supply hubs', and states that accelerating port electrification (including onshore power supply and grid connections) is a foundation for decarbonisation.

Ensuring that ports, particularly small and medium-sized ports, are equipped with adequate grid capacity and infrastructure for renewable and low-carbon fuels can enable and help de-risk the uptake of cleaner energy solutions by fishing and aquaculture operators. At the same time, it reduces the risk of fisheries being served late in an increasingly competitive market for alternative fuels. This is directly relevant for fisheries and aquaculture, which are structurally dependent on ports for landing, auctioning, maintenance, cold storage and logistics. The decarbonisation of these activities will often be driven by port energy infrastructure. Besides, substantial emission reductions and cost savings can be achieved by electrifying the shore-side services used by fishing and aquaculture operators (e.g. refrigeration, processing, equipment, charging of port machinery), provided that ports, especially smaller ones, have adequate access to the grid.

Maritime industrial capacity

Making the energy transition will require substantial shipyard capacity. **The current shipyard capacity** for constructing and retrofitting fishing vessels, reflects the current low demand for new-built vessels and retrofits. The number of new large-scale fishing vessels delivered by shipyards in Europe was relatively low[37], which has also been signalled in regular engagements with EU shipyards and equipment suppliers, for example in the context of the ETP. As fleet renewal is one of the main enablers for the energy transition, requiring a ramp up period and standardisation, constraints in shipyard capacity can provide a barrier to progress on the energy transition. This could result in long lead times and high unit costs for fishing vessel construction if fleet renewal is deemed an important transition enabler. Besides, consideration should be given to the aspects of international competitiveness and strategic autonomy for the the construction of new vessels.

The issues of shipyard capacity go beyond the fisheries sector alone. They must be developed as part of broader EU and national efforts to strengthen the competitiveness of the EU's maritime cluster. The European maritime industrial strategy (EMIS), adopted in 2026 by the Commission, provides an overarching strategy to drive competitiveness, innovation and technological leadership in the EU's maritime manufacturing and shipping industries. It aims to mobilise EU, national and private funding, as well as support investments in fleet decarbonisation and innovation. It will leverage instruments such as Horizon Europe, the Connecting Europe Facility (CEF) and the Innovation Fund, as well as risk-sharing instruments. The involvement of fisheries stakeholders is therefore important in context of the upcoming EU Industrial Maritime Value Chain Alliance.

Implications for the roadmap

The development constraints in viable net-zero technologies, shipyard production capacity and port infrastructure, and fuel availability and affordability call for careful consideration of the approach to the transition to climate neutrality, and in particular the speed of that transition. Pushing beyond the progress in these 'hard constraints' can substantially increase the costs of

[37] SEA Europe - MARKET INTELLIGENCE REPORT 2025

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the transition, with negative socio-economic impacts on the sector. At the same time, progress on these framework conditions should be ambitiously pursued in parallel. A carefully paced transition should be economically realistic for the stakeholders and ambitious at the same time. It should initially focus on the widespread options of currently available technologies – which are mostly in the area of energy efficiency – while at the same time stimulating progress on new solutions, by means of innovation from basic research to market uptake. Furthermore, technological progress unknowns require careful reflection on investment timing for the energy transition. Early investments, which are hard to reverse, can lead to a technological and financial lock-in, given that fishing vessels generally have a technical and economic lifetime of around 30 years.

Lastly, given the dependence on the development of fuels, infrastructure and industrial capacity that goes beyond strictly the fisheries sector, and the realm of fisheries policy, it is crucial not to create parallel work strands but to integrate work on these enablers into broader work strands initiated by the EU and its Member States.

Consideration 5: *The long-term energy transition requires closing the price gap between conventional and alternative technologies.*

Under current conditions, but also under some future projections[20], capital investments and operating costs (e.g. for costs of alternative fuels) for alternative propulsion systems remain relatively high compared to the current prices of conventional diesel.

Achieving cost parity between conventional fossil fuels and alternative technologies will be critical for accelerating the widespread uptake of technologies and ensuring the long-term viability and competitiveness of the energy transition in EU fisheries. There are several strands of action that could help close price gaps in the future.

First, technological improvements through continuous **innovation** in promising technologies are a main driver for bringing down production costs of alternative technologies and fuels. They also improve the performance, reliability and operational suitability of alternative propulsion systems, fuels and energy-saving technologies. Research, development and demonstration efforts can support advances in batteries, fuel cells, hybrid propulsion systems, renewable and low-carbon fuels, hull design, digital optimisation tools and energy-efficient fishing gear, which lower costs of production and operation. Innovation can also help address current operational constraints specific to fisheries, such as the relatively small size of fishing vessel, long operating hours and variable energy demands.

Second, scaling up production of technologies over time is expected to reduce costs through economies of scale, manufacturing standardisation and increased operational efficiencies, facilitating broader commercial adoption. In this regard, the fisheries sector can also benefit from progress and demand for technologies and sources in adjacent sectors. The AFIR and the FuelEU Maritime Regulation[38] aim to accelerate the availability and cost-competitiveness of alternative marine fuels by deploying mandatory bunkering infrastructure and introducing targets for the progressive reduction of greenhouse gas intensity in shipping. This will provide a foundation that can benefit fisheries vessels operating in shared maritime spaces.

Third, current policy settings and market dynamics favour conventional diesel fuels and disincentivise the transition in the fisheries sector. Energy tax exemptions increase the price gap between conventional fuels and clean alternatives. Moreover, they distort incentives for

[38] 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 (OJ L 234, 22.9.2023, p. 48, ELI: http://data.europa.eu/eli/reg/2023/1805/oj).

reducing energy consumption. Integrating the fisheries sector into harmonised carbon pricing frameworks such as the EU ETS can further incentivise decarbonisation in line with other economic sectors. In addition, the emerging architecture of EU carbon pricing, including the extension of the EU ETS to new sectors through ETS2, reflects a broader policy direction towards more comprehensive and consistent carbon price signals across the economy. Fisheries are included on a voluntary basis.

Fair taxation and the progressive phasing-out of fossil fuel tax exemptions are essential to enable the energy transition in fisheries. The Commission's 2021 proposal to revise the Energy Taxation Directive[39] supports this objective. While negotiations in Council remain ongoing and require unanimity, the Commission will keep the file on the table and continue supporting Member States to reach a compromise, in the context of a socially fair transition and a level playing field.

At the same time, consideration should be given to mitigating potential negative effects from phasing out such exemptions. Figure 4 (chapter 3) showed that parts of the fleet are highly vulnerable to fuel price increases (or any other sudden cost increase), with many operating at the limit of their long-term break-even fuel price. Accompanying measure may therefore be needed to support the sector's clean transition.

Consideration 6: *A fair transition for the fisheries sector.*

A fair energy transition in EU fisheries requires careful consideration of key social dimensions to ensure that advances in decarbonisation are equitable across stakeholders, without exacerbating existing vulnerabilities or leaving some communities or people behind.

First, the energy transition must prioritise strategies preserving economic vitality and social cohesion, in particular in remote and fisheries-dependent coastal communities. It can do this through infrastructure upgrades, job creation and retention and reskilling, and support for diversification of activities. As highlighted in the communication on resilient, prosperous and liveable coastal communities[40], fisheries play a key role in these areas, including to preserve local identity, local value chains, traditions and maritime heritage.

Second, the transition should ensure that the costs and benefits of decarbonisation are distributed fairly across fleet segments and operators. Smaller operators and SSCF vessels may face proportionally higher barriers to investment in low-emission technologies due to more limited access to finance, lower revenues and asset. Targeted financial support, risk-sharing instruments and accessible funding mechanisms will therefore be essential to avoid disparity within the sector during the transition.

Third, fishers should be placed at the centre of the transition. Skills development, vocational education and training (VET), and reskilling initiatives can equip fishers and fisheries workers with competencies related to hybrid and low-emission propulsion systems, energy-efficient fishing practices, digital technologies and vessel optimisation. In particular partnerships between VET provides and businesses can be effective in developing the skills needed for innovative technologies. Such measures can help transform decarbonisation challenges into opportunities for improved working conditions, increased employability and generational renewal in the sector. The Union of Skills provides frameworks to set-up such partnerships. The ports strategy and the European innovation monitoring system (EIMS) both set out actions to

39 COM(2021) 563 final
40 COM/2026/530.

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promote upskilling of the workforce in the maritime industries (some of them linked to decarbonisation), which fisheries and aquaculture stakeholders may also benefit from.

Fourth, the transition should promote inclusive governance and stakeholder participation. Fishers, producer organisations, coastal communities, social partners and regional authorities should be actively involved in designing and implementing transition pathways to ensure that measures are realistic, socially acceptable and adapted to local realities.

4. Conclusions

This SWD describes the core issues underlying the roadmap for the energy transition in EU fisheries and aquaculture, as set out in the Communication on the Vision for 2040 for fisheries and aquaculture (ref.) and its Annex. The analysis assesses the main structural, technological, economic and regulatory challenges affecting the transition towards a more resilient, competitive and decarbonised fisheries and aquaculture sectors in the European Union. It also identifies key enabling conditions, investment needs and possible pathways to support the uptake of low- and zero-emission energy solutions across the sector.

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Annex 1: Progress through the Energy Transition Partnership

Arguably, it was not the recent developments in terms of energy consumption and intensity since 2023 that were more important for the energy transition in the short term, but rather the significant efforts made by stakeholders preparing the ground for making the energy transition in the long run.

Since its inception in June 2023, the **Energy Transition Partnership** (ETP) has successfully mobilised over 690 stakeholders for the energy transition of EU fisheries and aquaculture in an innovative and inclusive way. They are cooperating with each other to face the key challenges for making the energy transition in the sector.

In figures: key achievements of the **Energy Transition Partnership** for EU fisheries and aquaculture

- **690** members cooperating under the Energy Transition Partnership
- **10** support groups, with stakeholder-led coordinators
- **2** high-level conferences
- **14** thematic workshops and 40 working group meetings under the ETP
- Presence in key forums and conferences, including the **European Maritime Days**
- **600+** subscribers to the ETP newsletter

In 2024, the Commission appointed 10 support group coordinators for thematic groups representing all key stakeholders: i) small-scale coastal fisheries (SSCF), ii) large-scale fisheries (LSF), iii) distant water fleet (DWF), iv) non-governmental organisations (NGOs), v) research and academia, vi) shipbuilding, vii) inland aquaculture, viii) offshore aquaculture, ix) fishing ports, and x) the processing sector[41]. The support group coordinators have been key in facilitating discussions and directly involving the subsectors and stakeholders in the work of ETP and its different working groups.

The ETP working group delivered a set of joint considerations and 10 sectoral recommendations for energy transition in 2050. Together with the results of in-depth analysis and studies, the **ETP joint considerations and sector recommendations form the backbone of the roadmap for the energy transition**. For reference these joint considerations and recommendations are included as an integral part of **Annex 1** to the SWD. The key outcomes were also presented and discussed by the working group coordinators at the high-level conference on the energy transition and fisheries and aquaculture, held on 17 February 2026.

Beyond collaboration, the ETP serves as a key hub offering practical resources to support fisheries and aquaculture stakeholders in their transition: a best practices compendium[42], an interactive financing guide[43], updates on relevant projects and Member State initiatives. A quarterly newsletter (600+ subscribers since October 2025) showcases these initiatives and informs the sector about the latest developments.

In May 2026, the ETP launched its pilot ambassador programme – building on ETP knowledge – appointing contacts in Member State administrations to provide on-the-ground guidance to fishers and operators, facilitate access to funding and technical support, and channel national

41 ETP Support Group - Maritime Forum - European Commission.

42 Best practices - Maritime Forum - European Commission.

43 Guide on Financing opportunities for the Green Energy Transition of Fisheries and Aquaculture - Maritime Forum.

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feedback into ETP activities. Lessons learned from the pilot will inform decisions on the programme's continuation and expansion of its network after September 2026.

Initiatives on the energy transition

The action on the energy transition has extended far beyond the Energy Transition Partnership. Many other private and publicly financed initiatives have emerged since 2023, including from the fisheries sector, public authorities, research institutes and beyond.

Institutional stakeholders have been constructive in making progress on the transition. In 2024, Parliament adopted, by a large majority, a resolution on the decarbonisation and modernisation of EU fisheries[44] and recently prepared an own-initiative report on the decarbonisation and modernisation of EU fisheries (92024/2123(INI)). The AGRIFISH Council adopted conclusions on the energy transition, among other things. In March 2026, on the initiative of the Cyprus presidency, EU ministers responsible for fisheries and aquaculture held an exchange of views on advancing the energy transition in EU fisheries and aquaculture. The discussion focused on how to accelerate the shift away from fossil fuels while maintaining the sector's economic viability and competitiveness.

Member States and regional authorities have deployed their own tailored plans for making the energy transition in the sectors. They have been proactive in working at EU and regional level on creating the conditions needed to progress on the transition in the fisheries and aquaculture sectors. Some have launched specific funding opportunities for improving the energy efficiency of their fishing fleet within the possibilities of the EMFAF, with substantial uptake by the sector.

A major achievement has been launching a range of pilot projects throughout the EU. Parliament, together with the Commission, launched its own Zero Emission Demonstrative Fishing Vessel powered by a hybridised system of hydrogen fuel cell and batteries (Hy2Fish)[45]. Other Horizon Europe projects[46] [47], have focused on digital technologies, energy efficiency and small-scale fishing vessels. The ETP website contains a continuously updated repository of demonstrators and other projects relevant for making the energy transition in the sector[48].

44 https://oeil.europarl.europa.eu/oeil/en/procedure-document-summary/pdf?id=1881375.

45 HY2FISH | The Future starts today.

46 HORIZON-MISS-2025-03-OCEAN-03 Digital technologies and energy transition in fisheries and/or aquaculture.

47 HORIZON-MISS-2023-OCEAN-01-05 Lighthouse in the Baltic and the North Sea basins - Green and energy-efficient small-scale fishing fleets.

48 Best practices - Maritime Forum - European Commission

Annex 2: Joint Considerations - EU Energy Transition Partnership for Fisheries and Aquaculture

***Disclaimer** *This document has been prepared by the ETP Support group members, it reflects the views only of the authors. The European Commission is not liable for its content and any consequence stemming from the reuse of this publication.*

Background

The ETP Support Group is a collaborative advisory body that supports the Energy Transition Partnership (ETP) in advancing the energy transition for EU fisheries and aquaculture. It is organised into ten working groups, each focused on a core segment of the sector: distant water fleet, large-scale fisheries, small-scale coastal fisheries, inland and offshore aquaculture, ports, fishing shipbuilding, processing and trading, research and academia, and NGOs.

From February to September 2025, these working groups, guided by their coordinators, convened stakeholders to identify challenges and develop sector-specific solutions. Over this period, 38 online meetings brought together nearly 400 participants, contributing to the formulation of sector specific recommendations for the energy transition roadmap.

The first phase of the process concludes with a coordinated set of cross-sector considerations that complement the sector-specific guidance. Acknowledging that a "one-size-fits-all" approach is not suitable, the support group calls for regionally tailored policies that reflect ecological, cultural, technical, and economic diversity, as well as different gear types, production systems, and infrastructure.

Guiding principles

A successful energy transition in European fisheries and aquaculture requires a holistic approach focusing on reducing energy use and carbon emissions across the food system; while ensuring marine ecosystems are in good health so they provide optimal natural sequestration and storage. It must integrate ecological restoration and conservation, technological innovation, vessel and infrastructure capabilities, and social equity while addressing climate pressures, biodiversity loss, ageing fleets, competitiveness challenges, and ecosystem degradation. Policies should be regionally tailored, aligned with EU and international frameworks, and provide long-term certainty, while being consistent with ending overfishing, **sustainable stock recovery** and supporting coastal communities through **inclusive**, socially just approaches.

Advancing the transition requires **coordinated governance**, stronger research collaboration, and improved information sharing, alongside practical testing of **cleaner propulsion systems**, **energy audits,** and the development of **resilient port and fuel infrastructure**, as well as appropriate **support for the industries underpinning the transition**, such as shipyards and maritime equipment suppliers. For the seafood processing and trading sector, this also includes improving energy efficiency, optimising logistics, and supporting low-carbon supply chain solutions**.** It is key to

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provide policy certainty to all segments, in particular the small-scale sectors for enabling a viable future which at the same time addresses its generational renewal. **Fleet modernisation**—through energy efficiency, impacts reduction, renewal and targeted retrofits—should prioritise **profitable**, **modular**, **adaptable**, safe, and future-proof vessel designs. **Regulatory simplification** and alignment with climate and maritime objectives are essential, including evaluating relevance of fishing capacity measurement and certification frameworks to accommodate emerging technologies.

Effective **financing and investment incentives**—through financial instruments, guarantees, and tax measures—are needed to support clean-technology uptake, while **skills development**, **training**, and **generational renewal** will build the workforce required for new energy systems and digital tools. By embedding these principles, the transition can reduce fossil-fuel dependence, strengthen **environmental resilience**, and secure a **competitive**, **sustainable future** for European fisheries and aquaculture.

1. ***De-risk investments with EU funding to incentivise decarbonisation in fisheries and aquaculture and unlock capital for the energy transition.***

High costs and perceived risks in the fisheries and aquaculture sector limit funding and private investment in the energy transition. Although the European Commission's proposes to relax eligibility conditions in the 2028–2034 MFF, current funding—especially EMFAF until 2029— remains restrictive, with caps on retrofitting and thresholds.

Targeted reform is needed to unlock funds quickly and equitably, including easing restrictions on newbuilding and retrofits, enabling pilots and demonstrators, allowing pre-financing, and simplifying access for small operators. Grants should complement loans and guarantees and be tied to clear sustainability, climate, and biodiversity objectives.

In parallel, State aid frameworks should be made more flexible to allow targeted national support for decarbonisation, innovation, and fleet modernisation, while ensuring a level playing field. Stronger engagement of the European Investment Bank (EIB)—through guarantees, blended finance, and tailored instruments—can further crowd in private capital and reduce risk.

Transparent, accountable funding is essential to support a fair and just transition toward energy-efficient, low-impact, and resilient fisheries and aquaculture while safeguarding food security.

How the Roadmap can address this:

- Discuss the current EMFAF rules to remove retrofitting and fleet renewal restrictions and simplify access for all operators, including pre-financing and reduced reporting.
- Establish a ring-fenced, meaningful funding window in the EU budget for small or capital-constrained operators.

- Support regional and community demonstrators, cooperative financing, and shared infrastructure projects.
- Define policies that can provide public guarantees to de-risk private investment, complemented by grants for the riskiest projects.
- Facilitate flexible State aid for decarbonisation and innovation and strengthen EIB support to de-risk private investment and scale clean technologies.

2. Demonstrate technical and economic feasibility of the energy transition through EU demonstration programme to strengthen business case in the sector

Fisheries and aquaculture have limited experience with low-carbon propulsion and energy efficient, low-impact technologies, slowing adoption due to uncertainty. Demonstration programmes tested under real operating conditions are essential to build confidence, assess technical and economic feasibility, and accelerate the transition to cleaner, more efficient operations.

Regionally tailored, participatory approaches—actively involving the entire fisheries and aquaculture value chain, and local authorities—ensure technologies meet real needs. Demonstrators should integrate port and onshore infrastructure, creating "living labs" for holistic testing of innovation ecosystems. For aquaculture, programmes should include energy-efficient systems, renewable integration, and low-carbon processing. Results should feed into the Knowledge Hub and guide wider replication across the EU.

How the Roadmap can address this:

- Launch co-designed EU demonstration programmes for low-carbon propulsion, energy-efficient, and low-impact technologies, including prototype vessels and aquaculture systems, validated under real-world conditions.
- Implement regionally tailored "living labs" that integrate vessel technologies, port infrastructure, and renewable solutions, reflecting environmental, operational, and socio-economic diversity.
- Support pilot projects and collaborative initiatives that actively involve industry, research, and local communities, ensuring validation of environmental, social, and economic performance, as well as practical relevance and cross-sector learning.

3. Establish a Decision-Support Programme for energy efficiency assessment in the entire value chain of fisheries and aquaculture

Entire EU fisheries and aquaculture value chains lack a systematic way to assess energy use, identify inefficiencies, and guide technology adoption. Existing audits are fragmented, inconsistent, and often inaccessible, limiting evidence-based investment and slowing sector wide efficiency gains.

Without a coordinated approach and an appropriate baseline, opportunities for quick improvements, cost reductions, and low-carbon, low-impact adoption may be missed, and policy decisions risk being uninformed. A structured, EU-wide system could

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generate comparable data, support planning and assess progress, and provide a foundation for equitable, technically feasible, and economically viable energy transition measures across the sector.

How the Roadmap can address this:

- Establish a coordinated EU-wide energy audit programme and funding support for operators, including a methodology, tools and devices that enable assessment and efficiency improvements.

- Establish a baseline that takes into consideration direct emissions and impact, indirect emissions, impacts on biodiversity and emissions related to the destruction of carbon sinks and that takes into consideration the entire value-chain. It should also take into account: the reduction previously made by the fisheries and aquaculture sectors since 1990 in accordance with the Climate Law.

- Conduct regional audits and pilot studies to reflect different environmental and operational conditions, informing targeted decision-support tools and national energy transition strategies.

- Engage industry actors in testing and implementing energy-efficiency measures and collective approaches, while integrating results into shared knowledge systems to track progress and support wider adoption.

4. ***Strengthen energy infrastructure and supply systems for fisheries and aquaculture to support the uptake of clean fuels, electrification, and renewable energy.***

Fisheries and aquaculture lack the port and energy infrastructure needed to adopt cleaner fuels and low-emission technologies, creating a major barrier to the energy transition. Investments in port electrification, renewable energy connections, and bunkering infrastructure for low-carbon fuels are therefore essential to enable modern, low-impact operations.

Planning must be based on a clear understanding of existing infrastructure, future energy needs, and regional differences, covering both maritime - ports and inland aquaculture facilities. Reliable access to renewable electricity, smart grid systems, and small-scale local generation will be key, particularly for small-scale operators.

A coordinated rollout—supported by (EU-level) funding and integration into broader clean transport and energy strategies—will ensure cost-effective, regionally adapted infrastructure development and support cross-border operations for fleets operating beyond national waters.

How the Roadmap can address this:

- Map existing ports, piers, quays and landing sites used for fishery and aquaculture operations, landing site, and energy infrastructure, and assess fleet, aquaculture and processing energy needs to guide targeted investment and planning.

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- Integrate fisheries and aquaculture into EU sustainable transport and energy strategies, prioritising renewable and low-carbon fuels, charging, and refuelling infrastructure.

- Promote interoperable, scalable, and regionally adapted infrastructure solutions through pilot projects, public–private partnerships, and stakeholder engagement.

- Coordinate across ports, fleets, and aquaculture operators to align infrastructure development with operational realities, regional contexts, and the broader energy transition.

5. ***Establish a progressive and incentivised transition plan for the fleet that promotes tailored solutions.***

European fisheries and aquaculture operate some of the oldest fleets in the maritime domain. Heavy retrofits on end-of-life vessels offer limited long-term benefits compared with strategic fleet renewal. Fleet renewal, however, is not just an energy transition measure — it also provides opportunities to reduce climate and biodiversity impacts, enhance crew safety, improve working conditions, and support inclusivity and the attractiveness of maritime professions.

A progressive, incentivised fleet transition plan should prioritise renewal of older vessels while targeting retrofits for mid-life vessels where technically and economically viable. New vessels should integrate advanced propulsion, circular design, safety features, lower impact gears diversifications and accessibility considerations. Financial support must address the limited investment capacity of small-scale coastal fleets, ensuring a fair and inclusive transition. Coordinated renewal and retrofitting, aligned with the broader energy transition roadmap, will contribute to deliver environmental, social, and operational benefits across the sector.

How the Roadmap can address this:

- Develop a European Fleet Transition Strategy integrating energy transition, profitability, climate and biodiversity impacts, safety, circularity, and inclusivity, with clear eligibility and prioritisation criteria for vessel renewal, retrofitting, and prototype development.

- Establish coordinated funding mechanisms, including EMFAF, Horizon Europe, and EIB facilities, and later the Competitiveness Fund, with facilitated support for small-scale operators.

- Promote regional demonstration clusters and shared retrofitting/maintenance facilities to test and deploy new designs adapted to local fleet and operational needs.

- Support training, capacity building, and partnerships to ensure adoption of safe, low carbon, inclusive, and circular vessel designs across the sector.

6. ***Strengthen the workforce and attract new generations through education, training, and upskilling in advanced technologies.***

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The fisheries and aquaculture sectors face a critical need for workforce renewal and skills development to support the energy transition. Technological innovation is accelerating, but the workforce often lacks the expertise to operate, maintain, and manage clean technologies. At the same time, an ageing workforce and limited recruitment of young professionals threaten knowledge transfer and the social and economic resilience of coastal communities.

A future-oriented strategy must combine technical training, generational renewal, and inclusivity, ensuring stable and rewarding careers. Education and upskilling should equip workers to manage hybrid vessels, alternative fuels, digital tools, and circular economy practices, while embedding gender equality and equal opportunities across the value chain. Lifelong learning, entrepreneurial skills, and awareness of climate, biodiversity, and sustainability issues will empower workers to lead the transition toward energy-efficient and low-emission operations.

Mentorship, apprenticeships, and demonstration projects can bridge experience gaps, fostering knowledge transfer and trust between generations. A comprehensive, inclusive skills strategy is essential to ensure that the energy transition delivers economic opportunities, social resilience, and a sustainable future for fisheries and aquaculture.

How the Roadmap can address this:

- Assess workforce gaps in energy transition relevant areas and integrate together with digital, and sustainability skills into education, training, and upskilling programmes, including apprenticeships and mentoring schemes.

- Promote gender equality, inclusivity, and practical skills development through targeted funding, micro-credentials, and innovation-driven training initiatives.

7. Integrate energy transition of fisheries and aquaculture into broader EU policies and harmonise regulatory frameworks

Fisheries and aquaculture face regulatory fragmentation across ports, shipbuilding, trading, processing, and maritime sectors, creating uncertainty and limiting access to EU funding for energy transition. Integrating the energy transition of fisheries and aquaculture into broader EU strategies—such as the Green Deal, Clean Industrial Deal, Industrial Maritime Strategy, the Industrial Accelerator Act, the Sustainable Transport Investment Plan, and the Circular Economy Act—is essential to simplify procedures, build trust, and enable coordinated sector wide transition.

Clear regulatory alignment, supported by expert review, can harmonise rules on fuels, licensing, and infrastructure, reduce administrative complexity, and facilitate technology adoption. Harmonised frameworks will support both short-term efficiency measures and long-term initiatives, including fleet renewal, low-emission fuels, and low-impact technologies, while providing a stable environment for investment and innovation.

How the Roadmap can address this:

- Align EU maritime, transport, climate, and industrial strategies with fisheries and aquaculture energy transition needs, and harmonise regulations across fleets, ports, shipbuilding, and processing industries.

- Ensure regional and national authorities coordinate implementation, accounting for local ecological, technical, and socio-economic conditions.

8. ***Strengthen EU shipyards and technology suppliers to drive innovation and competitiveness in clean maritime solutions and energy-efficient seafood production.***

EU shipyards and their suppliers face growing international competition, with many foreign operators benefiting from lower environmental standards and greater government support. Strengthening Europe's industrial base in cleaner and energy-efficient vessel technologies will boost competitiveness, retain the benefits of the energy transition domestically, and create skilled jobs.

Shipyards will have to scale up their capacity to handle newbuilding or retrofitting of fishing and aquaculture vessels in Europe. This requires significant productive investment in facilities and production efficiency, which are capital-intensive and now very attractive to traditional banks. Public support for these investments is necessary to ensure it is viable for the shipyards.

How the Roadmap can address this:

- Support EU shipyards and technology providers with funding and incentives for clean vessel technologies for fisheries and aquaculture, energy-efficient production, modular design, and circular manufacturing processes.

- Prioritise industrial competitiveness and innovation by aligning EU and national programmes, fostering SME participation, and facilitating collaboration between shipyards, research centres, and seafood producers.

- Develop and adopt EU-wide modular and adaptable vessel design standards for fisheries and aquaculture, covering multi-fuel capability, hybrid propulsion, multi-use and diversified low-impact operations, and safety integration.

9. ***Evaluate how the fishery capacity measurement system is fit for purpose for energy transition***

Current CFP capacity metrics (GT/kW) were designed to limit fishing effort and prevent overexploitation. However, low-emission technologies—such as batteries and alternative-fuel systems—add weight and take up space, with potential to push vessels beyond these thresholds. This creates a practical barrier to adopting clean technologies.

Capacity control remains crucial for conservation. The capacity ceilings are also currently crucial for social safeguards, as they are linked to fishing entitlements, vessel value, and retirement benefits. Changes to accommodate energy transition risk unintended biological, economic, and social consequences. Safety and classification concerns also arise with new fuels and batteries, requiring compliance with design, stability, and port regulations.

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A fit-for-purpose capacity system is needed—one that is sector-specific balances support for clean technology with effective fisheries management, accounting for fishing effort, catching efficiency, auxiliary power, and technological creep, not allowing overfishing and preventing fraud. Any revisions should be evidence-based, segment-specific, and sensitive to regional differences, building on the ongoing CFP evaluation process.

How the Roadmap can address this:

- Examine the definition of fishing capacity and GT/kW restrictions in the CFP evaluation, considering evidence-based amendments to support the energy transition while maintaining conservation and social safeguards.

- Convene an expert task force (e.g., STECF/ICES) with meaningful engagement of relevant stakeholders to assess the fitness of current metrics, explore alternative capacity measurement options indicating its social, economic and environmental consequences, evaluate safety and space implications of low-emission technologies, and produce time-bound recommendations; complement with fleet- and sea-basin level technical studies.

10. Establish the Energy Transition Partnership (ETP) for EU fisheries and aquaculture value chain as a permanent platform to implement the roadmap

Policymaking for the energy transition in fisheries and aquaculture is fragmented, causing duplicated efforts, misaligned standards, and missed opportunities for technology transfer. A central, light governance mechanism is needed to coordinate R&D, harmonise standards, and consolidate best practices in a public Knowledge Hub.

The ETP should serve as this mechanism, with a concise mandate to implement the roadmap, coordinate R&D, forecast investment needs, build collaborative investment plans, and oversee time-limited workstreams such as Standards & Interoperability, Innovation, and Regional Pilots. A two-tier structure—Strategic Board (Commission, Member State focal points, and representative stakeholders) supported by a technical secretariat—would combine strategic oversight with technical delivery, with national focal points ensuring domestic coordination.

The ETP should prioritise regional differentiation and technology flexibility and neutrality, set clear targets with an annual dashboard, and secure predictable funding for pilots, infrastructure, and innovation. Stakeholder engagement should be streamlined via umbrella representation, a single portal, digital consultations, and predictable schedules, ensuring equitable participation of all fisheries and aquaculture sectors, NGOs, research and academia, ports, shipyards, energy suppliers, and supply-chain actors.

How the Roadmap can address this:

- Establish the ETP as a single-entry platform with a Strategic Board and Technical Secretariat to implement the roadmap, coordinate R&D, and oversee time-limited workstreams with clear milestones, KPIs, and deadlines.

- Expand the Knowledge Hub to consolidate vetted project dossiers, lifecycle assessments, and best practices, requiring standardised submissions and linking outputs across EU-funded projects.

- Develop a comprehensive baseline and monitoring system for the fisheries and aquaculture sector, covering fleet and production facilities, energy use, emissions, biodiversity, carbon sinks, and socio-economic indicators, while integrating life-cycle assessments of new technologies and operational impacts.

- Engage stakeholders through umbrella organisations, digital consultations, and timeboxed workshops, ensuring equitable participation across all fisheries and aquaculture sectors, industry, research, and coastal communities.

- Promote regional pilots, cross-sector learning, and coordination with existing EU fora to test interoperability, fuel supply chains, retrofitting solutions, and to avoid duplication and silos.

WGs recommendations main recommendations.

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This section is anticipating the full recommendations coming from the 10 Working Groups set up under the ETP. Please revise also the full documents as they contain more details, analysis and recommendations.

See below the main actions recommended by each WG and links to the full documents issued by its members.

Fishing shipbuilding Working Group main recommendations *– see here the full document*

- Policies can provide public guarantees to **de-risk private investment**, complemented by grants for the riskiest projects.
- The fishing sector should forecast its modernisation/renewal needs, **allowing the shipbuilding industry to plan capacity** along a long-term roadmap.
- Launch a legislative amendment to **resolve the technical bottleneck**, incorporating input from naval architects and mitigating potential negative effects, such as overcapacity or overfishing.
- Launch and finance a demonstrators programme to **showcase new technologies in real-world and business conditions**, involving fishers directly to secure their buy-in.

Small Scale Fisheries Working Group main recommendations *– see here the full document*

The Small-scale Fishing sector (SSF) has reached a tipping point in decline. Therefore, issuing a binding Plan of Action to support SSF in Europe is needed to provide the necessary certainty for a brighter viable future which will act as a key enabler not just for the Energy Transition but also for its generational renewal. If that is done, SSF are well placed to keep leading the energy transition thanks to their already very low carbon footprint, creating an opportunity to revitalise the sector and provide better working

conditions. Prioritising public funding for the energy transition of this sector (which is ring-fenced, meaningful, accessible and tailored to them) is essential to achieve a fair level playing field.

Large Scale Fisheries Working Group main recommendations– see here the full document

The Large-Scale Fleet (LSF) deeply believes that an energy transition is necessary to achieve the goals of the CFP, support the EU Green Deal objectives and the general aim of transition to sustainability, while securing a future for fisheries as contributor to food security by providing benefits to society through blue food: low-carbon, sustainable, and highly nutritious source of protein.
This requires a forward-looking and socio-economically viable approach that not only encourages innovation but also ensures that regulatory constraints do not hinder progress. By fostering a policy environment that supports adaptation and modernization, through fleet renewal and removal of the fishing capacity, the EU can facilitate the European fishing sector to be both sustainable and competitive.

Distant Water Fleet Working Group main recommendations– see here the full document

- **Regulatory constraints:** Current rules, including fishing vessel registry limits on gross tonnage (GT) and engine power (kW), can restrict upgrades and retrofits. Addressing these barriers— through regulatory review, exemptions for low-carbon technologies, or targeted compliance pathways—is essential to enable modernization.
- **Financing and capital availability:** Insufficient access to funding hampers both retrofits of existing vessels and the construction of new, energy-efficient ships. A blended finance approach is needed, combining grants (e.g., EMFAF) with loan guarantees and concessional credit to de-risk investments and improve bankability.
- **Pilot projects and capability building:** Launching pilot programs is critical to build confidence and know-how in retrofit design. These should develop technical and economic models, standardize methodologies, and provide practical guidance to help vessel owners assess feasibility, costs, and expected performance of their energy transition projects.

Aquaculture Working Groups main recommendations- See here the full document

Offshore Aquaculture:

- Operators require a review of funding mechanisms for ET to make them **more easily accessible also by small companies.** Funds should be made available **sufficiently to promote green reconversion.** The operators require that a single level playing field for fund access is guaranteed at EU level.
- The development of tailored capacity building and training programs is needed **to equip the offshore aquaculture workforce with the necessary skills** to manage the new technologies, all along the blue value chain. Support training courses that are adaptable across Member States, with EU-level recognition **to ensure consistency and relevance.**
- Developing targeted strategies **to optimise feed production methods and sourcing of raw materials** is another important goal, together with **the implementation of pilot projects to supply feed industry with novel and**

sustainable raw materials. Low trophic aquaculture should be consistently promoted.

Inland Aquaculture:

- Targeted awareness raising, training, guidelines, good practices and case studies for the aquaculture and related sectors could **improve understanding and provide more just grounds for energy transition**.
- A roadmap and policies could enhance public guarantees **to de-risk private investment, complemented by grants for the riskiest projects**.
- More research on environmental and economic sustainability of specific energy transition cases could **support financial decision making**.
- Guidelines, case studies and good practices from the EU could ensure a better understanding of EU rules and regulations and encourage countries to adapt them, **ensuring a fairer ground for aquaculture producers.**

NGOs Working Group main recommendations *– see here the full document*

The NGO segment underlines that the energy transition of fisheries and aquaculture requires a **holistic, system-wide approach**, integrating climate mitigation, biodiversity protection, social justice and economic resilience. The transition must address the **entire value chain**, covering direct and indirect emissions, impacts on marine ecosystems and carbon sinks, and links with food systems and coastal communities. A **just transition** is essential, supporting fishers and aquaculture producers—especially small-scale actors—through clear regulation, funding, training and innovation. A **clear and coherent regulatory framework**, aligned with existing EU legislation and strategies, is essential to provide certainty, ensure coherence across policies and enable investment. Robust **scientific baselines, mapping and monitoring** are needed to assess progress, guide decision-making and ensure accountability. The roadmap must be backed by **adequate funding, fiscal incentives, skills development, research and innovation**, with improved access for small-scale actors and safeguards against overcapacity. Finally, a **just and inclusive transition**, supported by permanent stakeholder dialogue and effective governance, is identified as key to delivering lasting climate, biodiversity and socio-economic benefits.

Processing industry Working Group main recommendations *– see here the full document*

- Develop harmonised EU templates and protocols for collecting energy and emissions data.
- Provide guidance and tools to help companies meet sustainability reporting obligations, particularly in light of CSRD delays.
- Improve data comparability to support investment decisions and sector-wide monitoring.
- Conduct coordinated EU–Member State assessments of grid capacity, spatial constraints, and permitting challenges in processing sites, logistics hubs, and ports.
- Support investments in energy hubs, renewable energy deployment, onshore power systems, and expanded charging infrastructure.
- Promote shared logistics solutions and optimisation of cold chains to reduce fuel use and emissions.
- Align infrastructure planning across ports, shipyards, fisheries / aquaculture, and trading & processing industries.

- Expand EU funding for pilot and demonstration projects specifically for processing, trading, logistics, and circular-economy applications.
- Strengthen cooperation with academia, research bodies, and the ETP Assistance Mechanism to advance technology readiness and support knowledge transfer.
- Compile and share best practices and successful models from EU and global experience to guide operators toward viable solutions.
- Enhance financial tools (grants, guarantees, and incentives) to de-risk investments and ensure regional and economic feasibility.

Ports Working Group main recommendations – *see here the full document*

- Machinery and equipment unloading fish catches, transporting catches inside the port or loading the catches for further transport leads to high amounts of emissions related to fishing and aquaculture. The ETP should establish an EU co-financing program to replace diesel-powered equipment (forklifts, trucks, cranes, etc) with electric or hybrid alternatives, complemented by a joint European procurement mechanism to reduce costs for small ports. Include in the programs the obligation to measure and monitor carbon emissions.
- The lack of Onshore Power Supply (OPS) in fishing ports is due to a combination of factors including implementation costs, inconsistent grid capacity, lack of standardised equipment, and a mismatch between vessel and port infrastructure. The ETP should financially and technically support the implementation and deployment of OPS in all EU fishing ports by 2030 through:
  - Creating specific EU funding lines to co-finance the implementation of OPS infrastructure and/or the placement of new substations and electrical infrastructure in small (<5.000 t/year) and medium ports (5.000 – 20.000 t/year).
  - Co-designing incentive schemes such as reduced port fees or preferential electricity tariffs for connected vessels.
  - Supporting harmonisation and standardisation of OPS technologies at EU level to ensure interoperability across ports and fleets.
- Excessive dependence on traditional energy sources like fossil fuels leads to environmental issues such as air and water pollution and climate change, while also creating geopolitical vulnerabilities and economic instability due to fluctuating prices and supply chain risks. In this sense, Ports are significant energy consumers, primarily relying on non-renewable sources like diesel and fossil fuel-generated electricity for operations such as container movement, cranes, and lighting. The ETP should facilitate/encourage EU-financially supported pilot projects (through calls) and/or co-financed investments (i.e. EIB, CEF) to support the integration of renewable sources of energy (i.e. solar, wind, etc.), battery storage systems into port operations, prioritizing refrigeration and ice plants.
- The roadmap should promote a participatory and inclusive approach by integrating social engagement plans and supporting pilot projects that combine technological and social innovation, to reduce conflicts and align renewable energy deployment with local community's needs.

Research and Academia Working Group main recommendations – *see here the full document*

- Conduct a baseline study about the EU fleets reality (structure, fuel use, profitability) and explore feasible energy transition solutions to generate mutual trust (research, industry, sector).
- Detailed study on fuel use and emissions regulations and incentives within the EU fisheries and aquaculture sectors. Determine which regulations could be uniformly applied or tailored to fishing and aquaculture sectors, considering promotion of the efficient energy use and associated emission reductions.
- Encourage and support demonstration sites for testing solutions for decarbonising the fisheries and aquaculture sectors; identify sites where a holistic solution is possible, involving all the actors, from the vessel to the port and create a Living lab or demonstrator site to test solutions in real environment, with active involvement of the operators.
- Support and enhance capacity building of the fisheries and aquaculture workforce to new alternative fuels and solutions. Support specialised workforce trainings, help streamlining certifications and credentials within EU (adaptation of curriculum and allowing credentials to be used all along EU), and even promoting a micro-credentials system as a potential solution for training new workforce or re-skilling existing one.

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