

Policy brief:

Carbon-friendly & economically resilient EU fisheries



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The energy transition of the EU fisheries sector can improve the sustainability, economic profitability and resilience of the fisheries sector in Europe. This policy brief details recommendations to strengthen and support the energy transition of fleets towards carbon-neutral, less impactful and economically resilient fishing.



KEY MESSAGES

The climate crisis calls for all sectors to decarbonise, requiring the EU fisheries sector to shift away from carbon-intensive and high-impact fishing. **To achieve these aims, the EU must:**

Set EU-level guidance and national-level 2030-2050 emissions reduction plans with mandatory legislative measures that address all sources of greenhouse gas (GHG) emissions from fisheries:

- The European Commission (EC) should commission research to quantify the sources of GHG emissions of the fisheries sector.
- The EC should ensure that its upcoming energy transition roadmap provides clear guidance with milestones on how Member States can meet emission reduction targets by 2030 and 2050.
- Member States should integrate advice from the EC's energy transition roadmap, develop and publish national plans detailing how to decarbonise their fleets by 2030 and 2050 in an environmentally sustainable manner, and voluntarily publish annual updates on their progress in meeting climate targets.
- Member States should adopt legally binding objectives to measure progress and strengthen the ability of the sector to make the transition without causing further environmental harm. These legislative measures should secure obligations related to reducing all sources of emissions.

Move towards low-carbon and less impactful fishing techniques:

- The EC, Member States and the fisheries sector should improve the quality of data on EU fleets' fuel consumption and emissions.
 - The EC should support the development of a fuel and emissions monitoring programme designed to collate accurate, standardised data on fuel consumption and CO₂ emissions at the vessel level across Member States.
 - Member States should mandate that every vessel monitor, record, and report its fuel consumption and CO₂ emissions, through the integration of fuel-monitoring tools and reporting systems onboard vessels.
 - The EC should make publicly available data on the fuel consumption, energy efficiency, and CO₂ emissions of EU fishing fleets.
- The EC and Member States should thoroughly analyse the environmental and social consequences of technological and strategic fishing solutions to decarbonise fishing vessels. Where adverse impacts of alternatives are identified or cannot be accurately predicted, then those impacts must be avoided through further limitations on fishing activities to achieve decarbonisation goals.

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- Member States should mandate technological and strategic fishing solutions to save fuel according to the least harmful pathways. These measures would include increases in fleets' fuel efficiency, greater gear selectivity, and reduced gear impacts on sedimentary carbon stores.
 - EU decision-makers, Member States, and fishing companies should prioritise fuel-saving improvements and pilot studies in fisheries that use mobile bottom-contacting gears - the more fuel-intensive gears that pose the greatest risk to sedimentary carbon stores and seabed habitats.
 - The EC and Member States should promote the uptake of close-to-market and market-ready fuel-saving, innovative, and strategic solutions to fishing operations, vessels, and gear (e.g., large mesh sizes, new high-strength materials and reshaped wings, route planning systems, and fuel-monitoring devices).
 - EU coastal states should research the feasibility of mandatory slow steaming, according to fishing size and type, as a condition of entry for fishing vessels to ports.
 - The EC should fund more research to help support the development of a Fishing Route Optimisation Decision Support System (FRODSS) by fleet type, and then provide guidance to Member States on how fishing companies can implement these route optimisations across fleets.
 - The EC and Member States should develop studies to analyse how best to scale-up the switch from mobile bottom-trawling to more passive fishing techniques that have a lower environmental impact and lower fuel emissions. This should include assessing how to limit any environmental, economic, and social costs and how to transition the few mobile bottom-contacting fisheries with limited alternatives for catching certain target species (e.g., deep-water shrimp, sandeels).
 - Member States should mandate, develop demonstration projects, and provide guidance to the sector to switch their most fuel-intensive and high-impact gears to less energy-intensive, passive techniques.
- The EC and Member States should mandate green fuels, refrigerants and vessel propulsion, according to the least harmful pathway.
 - The EC and Member States should conduct a full GHG life-cycle assessment and comparative study of the alternative solutions, including the feasibility of technological transfer to fishing vessels, security and safety on board for fishers, and environmental consequences (e.g., related to toxicity, noise, and biodiversity). If such environmental consequences cannot be avoided, then fishing activities must be further limited as necessary to ensuring decarbonisation objectives can be met.
 - Member States should mandate and set funding schemes to allow small vessels below a certain size to be equipped with electric, battery-powered propulsion technologies.
 - The EC and Member States should cut existing policies supporting liquefied natural gas (LNG) as a maritime fuel and prevent new ones from being created.
- The EC should develop energy transition skills, education, and training programmes for fishers, to build knowledge on the benefits, available options, and skills required, and provide safety guidelines for fishers to switch to new energy efficiency measures and green fuels and propulsion technology.



Increase the climate resilience of fisheries management:

- The EU Council of Ministers must end overfishing and recover fish stocks in line with Article 2.2 of the Common Fisheries Policy (CFP) Basic Regulation by setting fishing limits and effort restrictions in line with scientific advice.¹
- The EC should apply climate and ecosystem-level considerations within fisheries management.
 - The EC should develop a formal procedure to better incorporate advice from the International Council for the Exploration of the Sea (ICES - such as Fisheries Overviews and Ecosystem Overviews) in the decision-making process to ensure that climate considerations are properly taken into account when setting fishing opportunities.
 - The EC should commission research through ICES to ensure that ecosystem-based fisheries management (EBFM) includes the broader consequences of fisheries on carbon sequestration, climate change, and how fisheries management can be enhanced to promote climate services and climate-resilience in target species and throughout the marine ecosystem. The findings of this research should be used to directly inform decision-making on fishing opportunities, to improve the basis for setting limits of commercial fish stocks within boundaries set by the role of fish in ecosystems.
- Member States should favour the allocation of fishing opportunities to less fuel-intensive and less impactful fisheries that contribute to the local economy, use more selective fishing gear, and have a lower impact on the environment, lower energy consumption, and lesser carbon footprint, such as less fuel-intensive small-scale coastal fisheries.
 - The EC should develop clear guidance for Member States on how to allocate fishing opportunities based on standardised environmental and social criteria (such as the impact of fleet segments on the seabed, the amount of carbon emitted per quantity of fish caught, or amount of bycatch) that are aligned with delivering the European Green Deal (EGD).
 - Member States should voluntarily publish annually how they objectively and transparently allocate fishing opportunities.
 - The EC should propose a new legal instrument, such as minimum criteria in line with the EGD that need to be considered when allocating fishing opportunities, and a review and reporting system for Member States to ensure correct implementation.

Protect blue carbon habitats from high-impact fishing:

- The EC should accelerate research to quantify the impact of fishing on EU marine carbon stores and the carbon storage capacity and disturbance sensitivity of marine habitats.
- Member States should restrict mobile bottom-fishing in areas with high organic carbon sedimentary stocks that are sensitive to disturbance through targeted ecosystem-based maritime spatial management plans.
- The EC should support and guide Member State efforts to help revise or establish new maritime spatial plans and to ensure effective monitoring and enforcement schemes.



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Support the transition to carbon-friendly fishing through EU funds and ensure fair, equitable funding access to vulnerable, small-scale coastal fisheries (SSCF):

- The Council of the EU and Member States should eliminate fuel tax exemptions for fisheries through the revision of the Energy Taxation Directive and ensure that the level of taxation is increased to a similar level for fuel taxation of vehicles, and extended and applied to all vessels that enter or leave EU ports.
- The EC and Member States need to remove direct fuel subsidies granted through State Aid.
- The EC and Member States should incorporate fishing activities within the EU Emission Trading System Directive (ETS) and the FuelEU Maritime Regulation.
- The Council of the EU and Member States should ensure sufficient funds and fair access to funds to all types of fishers to support their transition to low-carbon fisheries with less impact on marine ecosystems.
 - The EC must increase and provide clarity about EU funds that are available to support the energy transition, including non-fisheries specific funds (e.g., LIFE, European Structural and Investment Funds (ESIF), Just Transition Fund, Horizon Europe, RePowerEU) and provide guidance on how funds can be accessed in its forthcoming guide and database on financing opportunities to support the energy transition, which are expected to be developed in 2023.
 - The EC should also develop strict criteria and guidelines to ensure that funds:
 - (i) promote the energy transition of the sector; (ii) enable the transition towards less impactful fisheries in terms of both emissions and impacts on ecosystems; and (iii) ensure that funds do not contravene the objectives of the EGD, follow the “do no significant harm” (DNSH) principle, and do not support investment in fuel-intensive and carbon-intensive fishing practices.
- The EU and Member States should ensure that future State aid or any direct subsidies granted at EU and national level should only be granted to facilitate the transition towards the decarbonisation of the fishing sector or the transition towards less impactful and more socially fair fishing.
- Member States should provide greater funding support to small-scale coastal fisheries:
 - Member States should develop plans and dedicated administrative support at the local level to facilitate access to funding for SSCF businesses, to support their energy transition towards less impactful and low-carbon fishing, financed through the technical assistance available to Member States.
 - Member States should ensure that they provide more detailed information about funding for SSCF vessels or fishers within their annual reports on the implementation of EU funds.



CONTEXT

The climate crisis is one of the most significant challenges to our society, with some of the most severe threats manifesting in the ocean, such as warming, acidification, and loss of biodiversity. At the same time, the ocean is our greatest ally in tackling climate change, absorbing 90% of excess heat and capturing carbon more efficiently and faster than forests per unit area.^{2,3} The climate crisis requires direct and comprehensive action to limit anthropogenic greenhouse gas (GHG) emissions across all sectors.⁴ The fisheries sector is no exception, particularly given its contribution to increased global GHG emissions and cumulative pressures faced by the ocean (such as overfishing and destructive fishing), and its own vulnerability to the impacts of climate on the ocean resources that underpin its economic survival.^{5,6,7,8}

Through the Paris Agreement, the EU has pledged to limit global warming to below 1.5-2°C above pre-industrial levels and, under the European Green Deal (EGD), has committed for Europe to become the first climate-neutral continent by 2050 and cut emissions by at least 55% by 2030 compared to 1990.^{9,10} Through the European

Climate Law, these are no longer political promises but legal obligations, setting in stone how the EU can achieve this through EU law, sectorial, and societal action.¹¹

EU fishers can be stewards of the sea, using the right fishing equipment in the right place at the right time and ensuring enough fish for future generations and the marine ecosystem. Fishers' economic performance depends on sustainable fishing practices.¹² However, structural and management deficits in EU fisheries management and uncertain environmental and geopolitical landscapes have challenged the sustainability of fisheries. Today, EU fisheries are highly and almost exclusively dependent on fossil fuels, exacerbating air pollution and GHG emissions and hampering the sector's economic resilience and profitability. Some fishing techniques, such as the use of mobile bottom-contacting gears, are typically more fuel-intensive and non-selective, disturbing carbon-rich sediments and ecosystems. Despite progress towards fishing more responsibly, many EU stocks remain overfished or their status is unknown, and ecosystem-level information is lacking that is essential for setting science-based fishing opportunities and ensuring that stocks are resilient to climate impacts.¹³ Allocation of fishing opportunities and subsidies typically favour the activities of large-scale fishing fleets, which are generally more fuel-intensive than small-scale fleets.¹⁴

As Frans Timmermans, Executive Vice-President for the EGD, highlighted: *"much of our economy depends on nature. Fisheries are quite possibly the sector where this link is most direct... Europe's marine ecosystems and the fish, shellfish, algae, and plants that are part of them are crucial to the economic viability of fisheries"*.¹⁵ The European Commission (EC) has launched an initiative with a set of actions to support the fisheries sector's energy transition, to remove its energy dependence on fossil fuels and boost its economic profitability and resilience while ensuring it contributes to meeting EU climate targets.¹⁶ The energy transition of EU fisheries must accelerate to cut the sector's emissions while increasing its economic resilience and profitability, particularly in the case of SSCF.



POLICY RECOMMENDATIONS

Decision-makers at EU and national level and the sector itself need to fulfill their obligations to transition the fisheries sector in Europe to being sustainable, economically profitable, and with a neutral CO₂ footprint by 2050. ClientEarth and Oceana urge EU institutions, Member States, and fisheries stakeholders to consider the following:



EU fleets need energy transition plans, with mandatory legislative measures that address all GHG emissions of the sector to achieve net-zero climate targets

For the sector to achieve a neutral CO₂ footprint by 2050, the EC will need to reduce all sources of GHG emissions from the fisheries sector and develop plans with measurable milestones and objectives to support Member States in achieving climate-neutral fisheries. The EC is expected to release in 2024 a roadmap for the energy transition of the fisheries and aquaculture sector towards climate neutrality by 2050. The EC's recent communication on this topic states that progress towards energy efficiency and the use of renewable

and low-carbon energy sources in the sector will form the backbone of the transition towards climate-neutral fisheries in the EU.¹⁶ However, this will not be sufficient to address all sources of emissions from the sector. The vision fails to include the intention of addressing all sources of emissions from the fishing sector beyond its fuel emissions, nor does it encourage Member States to set legally binding targets and objectives to measure progress in reducing GHG emissions and achieving a neutral CO₂ footprint by 2050. There is an urgent need

for the EC to commission more comprehensive research to quantify the *total* GHG emissions of the fisheries sector, beyond just its fuel emissions, to ensure that the EU addresses all sources of emissions (such as emissions from disturbing carbon-rich habitats and disrupting species' roles in oceanic carbon cycling) in the energy transition roadmap for the sector. Failure to account for all

sources of emissions will lead to a failure in transitioning the sector to climate neutrality. To achieve these climate ambitions at national level, Member States will need to develop national emissions reduction strategies, with binding measures to support the transition, as well as publishing and tracking progress.



Action required:

The EC should commission research to quantify all sources of GHG emissions from the fisheries sector, such as CO₂ emissions from fuel consumption, from fishing techniques through physical contact with carbon stores, and from disruptions to the ecological carbon function of marine species through the removal of marine species. This would enable a more complete picture of the impacts of fisheries in terms

of CO₂ emissions and would allow a more realistic assessment of the CO₂ footprint and reduction needs. The EC should consult the European Scientific Advisory Board on Climate Change to provide independent scientific advice on measures and climate targets, and ensure coherence with the European Climate Law.

The EC and Member States should develop emission-reduction roadmaps for the fisheries sector. The EC should ensure that its upcoming energy transition roadmap provides clear guidance with milestones on how Member States can meet emission reduction targets by 2030 and 2050. Member States should integrate advice from the EC guidance, develop and publish national plans detailing how to decarbonise their fleets by 2030 and 2050 in an environmentally sustainable manner, and voluntarily publish annual updates on their progress in meeting climate targets. In addition, Member States should adopt legally binding objectives to measure progress and strengthen the ability of the sector to make the transition without causing further environmental harm. These legislative measures should secure obligations related to reducing all sources of emissions (e.g.,

fuel emissions, bottom disturbance to carbon stores and species' ecological carbon functions). These can be achieved through: mandatory energy efficiency measures (mandate fuel and emissions monitoring and reporting, exploring the feasibility of mandatory slow steaming based on vessel size/type); better implementation of an ecosystem-based approach to fisheries management; obligations related to green fuels, refrigerants, and propulsion (e.g., require small fishing boats to be equipped with electric propulsion based on size, and include fishing vessels under the FuelEU Maritime Regulation); and putting a realistic price on fossil fuels through eliminating fuel tax exemptions for fishing vessels in the revised Energy Taxation Directive (ETD) and including fishing vessels under the EU ETS. These plans will be crucial to ensure that the sector meets the emissions reduction targets set out under the European Climate Law.



EU fleets need to shift towards low-carbon and fuel-efficient fishing practices

Fishing techniques in Europe rely heavily on fossil fuels, and this dependence severely hinders their economic and social viability while also being a significant source of GHG emissions.¹⁷ Some fishing activities impact the marine environment through direct physical contact with carbon-rich habitats, which can reduce the ocean's carbon storage capacity and may potentially constitute an additional source of emissions.^{18,19} Fishing techniques differ in terms of their environmental impacts and fuel consumption. However, active gears such as beam trawls, dredges,

and bottom trawls, are generally more environmentally damaging and require more fuel per kg of the catch than passive gears, such as pots, traps, and hooks.²⁰ Many fuel-saving solutions exist, such as strategic changes to fishing operations (e.g., slow steaming, route-planning systems, auto-pilot, fuel monitoring devices, improved vessel maintenance), and technological improvements to gear (e.g., new netting designs, different mesh sizes, panel cuttings, switching from demersal to semi-pelagic trawling doors, or from mid-water trawls to purse seines) and to

vessels (hull and propeller improvements such as anti-fouling coatings, or the addition of a bulbous bow).

Although many fuel-saving options exist today, the EU will need to unlock challenges (technical, management, socioeconomic, and capital challenges) that prevent the wide-scale application of close-to-market-ready fuel-saving solutions (e.g., slow steaming, route optimisation, new netting designs, mesh size) and more extensive fuel-saving solutions to reduce the most fuel-intensive and high-impact fishing techniques (e.g., semi-pelagic doors, retrofits from mid-water trawls to purse seines). The EU and Member States have many tools available to remove these barriers, including but not limited to improving data collection and monitoring of fuel and emissions; improving ocean literacy; developing skills, safety protocols and training programmes for fishers on the fuel-saving options and their benefits; improving access to capital for implementation; carrying out pilot studies for new fuel-saving measures; improving research on the feasibility, application and costs of more extensive fuel-saving solutions and mandates for innovation measures.²¹ It is essential to prioritise a shift away from the most-fuel intensive and high-impact fishing practices, through fuel-saving improvements and switching from active to passive gears. The EU must prevent band-aid fuel-efficiency techniques, such as pulse fishing instead of beam trawling or dragging lighter trawl doors on the seabed, both of which have been recognised as having significant environmental impacts and do not represent long-term solutions.^{22,23}

Beyond fuel efficiency measures, for fishing vessels to completely phase out GHG emissions, a transition from fossil fuels to alternative low- to carbon-neutral fuels and energy sources will be necessary, and will require a

combination of solutions. These solutions should include a combination of direct renewable energy propulsion technology (e.g., sails) and alternative fuels (e.g., green hydrogen electricity). The alternative fuels available today have limitations, with many solutions lacking maturity, various trade-offs to consider, uncertain environmental impacts, and no apparent 'one fuel to rule them all' solution for all fleets. Selecting an alternative fuel requires precaution, including conducting a full GHG life-cycle assessment and assessing other potential environmental and social impacts. For example, while LNG has been touted as a technically feasible solution, it remains a carbon-intensive fossil fuel, with emissions of GHG (particularly methane) associated with its production, shipping, and use - including methane leakage from marine engines.²⁴ Therefore, efforts should focus instead on mandates, development, research, and deployment of zero-carbon fuels.²⁵ Where reliance on alternative technologies will cause environmental or social harm, or such impacts cannot be accurately anticipated, they must be avoided through further limitations on fishing activities to ensure that decarbonisation objectives can be achieved.



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Action required:

The EC, Member States, and the fisheries sector should improve the quality of data on EU fleets' fuel consumption and emissions. The EC should support the development of a fuel and emissions monitoring programme that is designed to collate accurate, standardised data on fuel consumption and CO₂ emissions at the vessel level across Member States. Member States should require every EU vessel to monitor, record, and report its fuel consumption and CO₂ emissions, through the integration of fuel-monitoring tools and reporting systems onboard vessels. Each EU fishing company should be obliged to submit to the EC and its Flag State a report on the fuel and emissions of its fishing fleet. The EC

should make publicly available data on the fuel consumption, energy efficiency, and CO₂ emissions of EU fishing fleets. Direct measurements of fuel use (and GHG emissions) during fishing activities could be possible by installing fuel loggers onboard vessels and mandatory reporting through logbooks or further developing automated intelligent fuel loggers. This could be a similar set-up to what is required from maritime transport, under the EU Monitoring, Reporting and Verification (MRV) Regulation.²⁶ This would allow for greater accuracy in monitoring the fuel emissions of fleets and the potential fuel savings that can be achieved from technological and strategic changes.

The EC and Member States should mandate technological and operational fishing solutions to increase fleets' fuel efficiency and gear selectivity and reduce gear impacts on sedimentary carbon stores. EU decision-makers, Member States, and fishing companies should prioritise fuel-saving improvements and pilot studies in fisheries that use mobile bottom-contacting gears - the more fuel-intensive gears that pose the greatest risk to sedimentary carbon stores and seabed habitats. The EC and Member States should promote the uptake of close-to-market and market-ready fuel-saving, innovative, and strategic solutions to fishing operations, vessels, and gear (e.g., large mesh sizes, new high strength materials and reshaped wings, route planning systems, fuel-monitoring devices). EU coastal states should research the feasibility of mandatory slow steaming, according to fishing size and type, as a condition of entry for fishing vessels to ports. The EC should fund more research to help support the development of a Fishing Route Optimisation Decision Support System (FRODSS) by fleet type, and then provide guidance to Member States on how fishing companies can implement these route optimisations across fleets. Reduced vessel steaming speed can reduce fuel use by a further 15-59% and a FRODSS can reduce the

time spent at sea and fuel use by 50%.^{27,28} Building awareness among fishing operators and skippers about vessels' fuel consumption could save fuel by 5-15%.²¹

In the medium- to long-term, Member States should take initiatives to mandate, develop demonstration projects, and provide guidance to the sector to switch their most fuel-intensive and high-impact gears to less energy-intensive passive techniques, which can lead to fuel savings of 34%.²¹ Shifting from mobile bottom-contacting gears to semi-pelagic trawls, and from mid-water trawls to purse seiners can result in fuel savings of 37% and 66%, respectively. While such shifts will imply changes in certain fisheries, most demersal organisms can still be captured with other fishing techniques.²⁹ The EC and Member States should develop studies to analyse how best to scale-up the switch from mobile bottom-trawling to more passive fishing techniques that have a lower environmental impact and lower fuel emissions. This should include assessing how to limit any environmental, economic, and social costs and how to transition the few mobile bottom-contacting fisheries with limited alternatives for catching certain target species (e.g., deep-water shrimp, sandeels).

The EC and Member States should mandate green fuels, refrigerants, and vessel propulsion: Switching to sails could reduce 100% of a vessel's GHG emissions, while a switch from fossil fuels to green fuels, such as green hydrogen, and electricity could reduce GHG emissions by 80-100%, and 50-90%, respectively.²¹ Before adopting any technology, the EC and Member States should conduct a full GHG life-cycle assessment and comparative study of the alternative solutions, including the feasibility of technological transfer to fishing vessels, security and safety on board for fishers, and environmental consequences (e.g., related to toxicity, noise, and biodiversity impacts). If such environmental consequences cannot be avoided, then fishing activities must be further limited if necessary to ensure that decarbonisation objectives can be met. Member States should mandate and

set funding schemes to allow small vessels below a certain size to be equipped with electric propulsion technologies running on batteries. In line with the precautionary approach to EU management and the GHG concerns regarding LNG (in particular the climate impacts of methane leakage along the LNG supply chain and from marine engines), the EC and Member States should cut existing policies supporting LNG as a maritime fuel and prevent new ones from being created. The EC and Member States should close the competitiveness gap between fossil fuels and zero-emission fuels by increasing the price of fossil fuel use through realistic carbon pricing, removing harmful capacity-enhancing subsidies including fossil fuel subsidies, removing investment in fossil fuel infrastructure, and reducing the costs of zero-emission alternatives through subsidies.

The EC should develop energy transition skills, education, and training programmes and safety protocols for fishers, to build knowledge about the benefits, available options, and skills required, and

provide safety guidelines for fishers to support the shift to new energy efficiency measures and green fuels and propulsion technology.



EU blue carbon habitats need greater protection from high-impact fishing

Mobile bottom-contacting gears can disrupt the carbon storage capacity of seabed sediments through physical disturbance, which resuspends large volumes of sediment into the water column.³⁰ Once resuspended, sedimentary carbon can be converted to CO₂, which is likely to increase ocean acidification and reduce the capacity of the ocean to absorb atmospheric CO₂.¹⁹ Globally, bottom-trawling has been estimated to produce 1.47 Petagrams of carbon dioxide emissions into the water column annually.¹⁸ In Europe, where the seabed is the most heavily bottom-trawled in the world,³¹ impacts on organic carbon storage capacity could be considerable. The scale of impact varies depending on the specific location and fishing activity, but activities which increase the extent or frequency of seabed sediment disturbance can limit organic carbon concentrations stored in surface sediments and subsequent storage.³² There are large uncertainties around estimates of the impacts of fishing on carbon storage and the consequences of sediment resuspension, emphasising the

need for the EC to commission research to estimate and map the carbon capacity and disturbance sensitivity of EU marine habitats, and to quantify the impacts of fishing on EU sedimentary carbon stores. At the same time, removing pressure and protecting 'blue carbon' habitats (i.e., marine ecosystems that are particularly important for storing carbon) can help to recover their carbon storage capacity and avoid the resuspension of carbon stored in sediments. Bottom-trawling remains widespread in EU waters, and there are no specific preventive measures to limit fishing impacts on sensitive carbon stores. Existing EU maritime spatial plans and marine protected areas were not designated to protect marine carbon stores or aligned with EGD objectives, and therefore do not necessarily overlap with carbon-rich habitats. Maritime spatial plans should be realigned with the ambition of the EGD to protect important and sensitive carbon stores from high-impact fishing techniques while maintaining ecosystem services to humans.



Action required:

The EC should accelerate research to quantify the impact of fishing on EU marine carbon stores and the carbon storage capacity and disturbance sensitivity of marine habitats. This research is scheduled to be launched in 2024, under the EC's Marine Action Plan,³³ and should be carried out as soon as possible, to better inform decision-making on protecting these habitats from disturbance, and to recognise the need to limit fishing impacts on carbon rich and sensitive sediments as part of the energy transition of fleets.

EU Member States should restrict mobile bottom-fishing in areas with high organic carbon sedimentary stocks that are sensitive to disturbance through targeted ecosystem-based maritime spatial plans. All coastal EU Member States should develop and align existing maritime spatial plans with the EGD, further incorporating an ecosystem-based approach to maritime spatial planning to protect and limit bottom-trawling in any waters with high marine organic carbon sedimentary stores and disturbance sensitivity. The EC should support and guide Member State efforts to help revise or establish new maritime spatial plans and to ensure effective monitoring and enforcement schemes.



EU fisheries management and fish stocks need greater climate resilience

Fisheries can produce further GHG emissions through the excessive extraction of fish, which removes carbon stored in the biomass of fish that would otherwise remain within the ocean, releasing CO₂ to the atmosphere and disrupting carbon flows in marine ecosystems.⁶ By rebuilding stocks and preventing overfishing, EU decision-makers can both ensure a continued supply of fish for future generations, and reduce the GHG emissions of fishing by preserving the role of fish as contributors to climate services. Specifically,

fishing sustainably can help preserve the living carbon in fish stocks and the associated carbon sinking through fish carcasses, maintain the function of bony fish in buffering ocean acidification through their contribution to carbonate production, and protect the role of predatory fish in producing less CO₂ through respiration and consequently, sequestering more carbon in sediments.^{5,34,35} Furthermore, ending overfishing would cut fuel and operational costs for the fishing sector; more available stocks mean less time

and economic effort needed to reach fish stocks, leading to both higher profits and fewer emissions. In particular, the fuel footprint per kilogram of seafood can dramatically decrease with stock recovery, saving 50 kilograms of CO₂-equivalent per kilogram of wet-weight seafood.³⁶

EU decision-makers have failed to rebuild EU stocks in line with the CFP objectives, with many EU fish stocks remaining overfished or outside safe biological limits. The situation is particularly dire in the Mediterranean and Black Seas, with average annual fishing mortality far above F_{MSY} levels (2003-2020).³⁷ Many fish stocks still lack defined fisheries management reference points such as F_{MSY} or B_{MSY}.¹⁷ The EU Council of Ministers must meet their overdue legal obligations to set fishing opportunities in line with scientific advice.

Moreover, in violation of their obligations under Article 17 of the CFP Basic Regulation, Member States fail to allocate fishing opportunities more fairly to environmentally, economically, and socially sustainable fleets. Member States are not transparent in their decision-making process in terms of which criteria they use when deciding which

fleets are granted greater allocated fishing opportunities, and the EC provides no comprehensive guidance to Member States on how to allocate fishing opportunities. This situation results in greater access to fishing grounds for industrial fleets, which have a larger fossil fuel footprint than small-scale fleets.

More broadly, the EU needs to better implement an ecosystem-based approach to fisheries management (EBFM) in line with Article 3 of the CFP Basic Regulation. Current fisheries management is dominated by conventional single-species approaches, with catch or effort limits typically based on single-species scientific advice. The process fails to consider ecosystem concerns beyond just commercial species, such as the impact of fishing on non-target species, food webs, the environment, or climate change impacts.³⁸ Better implementation of an EBFM would provide an opportunity for fisheries management that not only benefits ecosystems and the viability of stocks but also maintains the climate services provided by marine organisms and increases the sector's resilience to climate-driven changes in fish stocks.³⁹



Action required:

The EU Council of Ministers should adopt an EU zero-tolerance approach to overfishing. The EU Council of Ministers must end overfishing and recover fish stocks

in line with Article 2.2 of the CFP Basic Regulation by setting fishing limits and effort restrictions in line with scientific advice.

EU Member States should favour the allocation of fishing opportunities to less fuel-intensive and less impactful fisheries that contribute to the local economy, use more selective fishing gear, and have a lower impact on the environment, lower energy consumption, and lesser carbon footprint, such as less fuel-intensive small-scale coastal fisheries. The EC should develop clear guidance for Member States on how to allocate fishing opportunities based on standardised environmental and social criteria that are aligned with delivering the EGD

(such as the impact of fleet segments on the seabed, the amount of carbon emitted per quantity of fish caught, or amount of bycatch). Member States should voluntarily publish annually how they objectively and transparently allocate fishing opportunities. To ensure better implementation of Article 17 of the CFP Basic Regulation, the EC should propose a new legal instrument, such as minimum criteria in line with the EGD that need to be considered when allocating fishing opportunities, and a review and reporting system for Member States to ensure correct implementation.

The EC should apply climate and ecosystem-level considerations within fisheries management. The EC should commission research through ICES to ensure that EBFM includes the broader consequences of fisheries on carbon sequestration, climate change, and how fisheries management can be enhanced to promote climate services and climate-resilience in target species and throughout the marine ecosystem. The findings of this research should be

used to directly inform decision-making on fishing opportunities, to improve the basis for setting limits of commercial fish stocks within boundaries set by the role of fish in ecosystems. The EC should develop a formal procedure to better incorporate advice from ICES (such as its Fisheries Overviews and Ecosystem Overviews) in the decision-making process to ensure that climate considerations are properly taken into account when setting fishing opportunities.



Support the transition to carbon-friendly fishing through EU funds and ensure fair, equitable funding access to vulnerable SSCF:



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The European Maritime Fisheries and Aquaculture Fund (EMFAF), one of the funding instruments for the energy transition for the fisheries sector, will be crucial for providing funding to increase the energy efficiency of fleets, pilot projects, switching to electrified engines, and training for fishers to move towards different fishing techniques or towards other green energies.⁴⁰ However, the EMFAF will not be able to cover all the costs associated with the transition and must be complemented with other sources of funding to assist fishers, such as under the ESIF, Just Transition Fund, Horizon Europe, and RePowerEU. The availability of additional national resources allowing Member States to meet the climate targets is unclear, and access to funds is a barrier that prevents the uptake of fuel-saving and green practices. Clear guidance is therefore needed from the EC on how fishers can access funds. National administrations should create dedicated support for fishers to facilitate access to funding at the local level, in particular for small-scale coastal fishers which have received only 20% of EU funds in the last decades despite representing almost 80% of the EU fishing fleet.¹⁴ The EC's proposed action of creating, by 2023, a guide and database on financing opportunities that support energy transition will offer an opportunity to clarify these uncertainties related to access and sources of funding.

There is also a need to price the adverse climate effects of fishing. National subsidies and the EMFAF still include potentially capacity-enhancing subsidies in EU fisheries. In particular, direct and indirect fossil fuel subsidies artificially reduce the cost of fishing and therefore can stimulate overcapacity and

overfishing.^{36,41} They can also increase incentives for fossil fuel production, allowing the overproduction of fossil fuels while undermining the competitiveness, development, and upscaling of renewable energy alternatives.⁴² Removing fuel tax exemptions such as the one included in the ETD could help reduce fleet fuel consumption and trigger increased investment in energy-efficient solutions, and promote the use of less fuel-intensive practices.^{43,44} The EC's revision of the ETD represents a key opportunity to remove fuel tax exemptions for fisheries. The Council of the EU and each Member State should be coherent with their climate commitments and introduce taxation of fuel for fisheries in order to incentivise the energy transition of the sector. Maintaining a general fossil fuel tax exemption would only maintain the fisheries sector in a state of high dependency on fossil fuels, and prevent the sector from decarbonising. In addition to eliminating indirect fossil fuel subsidies, the EU and Member States should eliminate direct fossil fuel subsidies granted in the form of State aid, including de minimis State aid. Future State aid should only be granted if it contributes to the energy transition of the sector, and fisheries State aid guidelines should be modified in order to reflect this priority.⁴⁵

The EU should also put a realistic price on fuel-intensive industrial fishing by including fisheries under the EU Emission Trading System (ETS) Directive. Failing to include industrial fishing activities within the ETS prevents action to limit fuel-intensive fishing activities, promote low-carbon fisheries, and support the equitable allocation of fisheries resources internationally.³³

Their inclusion in the ETS is particularly needed to prevent loopholes enabling fishing vessels operating in distant waters to refuel in third countries and evade their obligations to pay higher fuel costs outlined under the ETD. The EC should also ensure it includes fishing activities under the FuelEU Maritime Regulation to support the shift towards renewable e-fuels in the fishing industry.



Action required:

The Council of the EU and Member States should eliminate fuel tax exemptions for fisheries through the revision of the ETD and ensure that the level of taxation is increased to a similar level to fuel taxation for vehicles, and extended and applied to all vessels that enter or leave EU ports.

The EC and Member States should incorporate fishing activities within the EU ETS Directive and the FuelEU Maritime Regulation to reduce fishing activities that are not socially and environmentally sustainable, and to support the shift away from fossil fuels. The EC should propose to include fishing activities within any upcoming revision of the ETS and under the FuelEU Maritime Regulation.

The EC and Member States should ensure sufficient and just funds for the transition to low-carbon and less impactful fishing. The EC must increase and provide clarity about EU funds that are available to support the energy transition, including non-fisheries specific funds (e.g., LIFE, ESIF, Just Transition Fund, Horizon Europe, RePowerEU) and provide guidance on how funds can be accessed. In its forthcoming guide and database on financing opportunities to support the energy transition, which are expected to be developed in 2023. The EC should also develop strict criteria and guidelines to ensure that funds:

- (i) promote the energy transition of the sector;

Member States should provide greater funding support to SSCF: Member States should develop plans and dedicate administrative support at the local level to facilitate access to funding for SSCF businesses, to support their energy transition towards less impactful and low-carbon fishing, financed through



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- (ii) enable the transition towards less impactful fisheries in terms of both emissions and impacts on ecosystems; and
- (iii) ensure that funds do not contravene the objectives of the EGD, follow the DNSH principle, and do not support investment in fuel-intensive and carbon-intensive fishing practices.

At the national level, support can be provided through State aid, provided that it is in line with the above conditions. Any other subsidies at EU and/or national level should only be granted to facilitate the transition towards the decarbonisation of the fishing sector or the transition towards less impactful and more socially fair fishing.

the technical assistance available to Member States. In addition, Member States should ensure that they provide more detailed information about funding for SSCF vessels or fishers within their annual reports on the implementation of EU funds.

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