BETTER USE OF PUBLIC MONEY: THE END OF FUEL SUBSIDIES FOR THE EU FISHING INDUSTRY

Our Fish ClientEarth

1. EXECUTIVE SUMMARY

The EU fishing fleet has been exempted from €0.8 - €15.7 billion in fuel taxes between 2010 and 2020. The European Green Deal and Fitfor55 package require industries to reduce emissions and cut fossil fuel subsidies. In the proposal for a revised Energy Taxation Directive (ETD), the proposed tax rate for fishing industry fuel is as low as €0.036 per litre; approximately 20 times lower than average tax rates used for road transport (€0.67 per litre). However, removing fuel subsidies does not necessarily mean a reduction in overall support for the fisheries sector: 17 alternative subsidies outperform fuel subsidies environmentally, socially, and economically, with an average impact score of 188% over fuel subsidies. With €0.33 tax per litre in 2019 (the minimum level of taxation applicable to motor fuels specified in the EU Council Regulation on the taxation of energy products), the EU could have paid the salaries of twenty thousand fishers for a year or six thousand energy reduction & decarbonisation projects. This means €0.036 per litre does not reflect the price of the carbon pollution and will not be sufficient to support a just transition to low-impact and low-carbon EU fisheries. Removing fuel subsidies is a necessary first step for a just transition towards low-impact and low-carbon EU fisheries.

EU fleet tax exemptions

This report demonstrates that in 2019, the EU large-scale fleet was exempted from paying €71 million in the lowest tax scenario (€0.036 per litre), while this amount would have been €653 million at €0.33 per litre and €1.3 billion at €0.67 per litre. For the EU small-scale fleet, this would have been €3.1 million, €28 million, and €57 million, respectively.

Reference year 2019	Litres	Taxes of €0.036 per litre in €	Taxes of €0.33 per litre in €	Taxes of €0.67 per litre in €	Tonnes of CO_2
SMALL-SCALE FLEET	**84,804,624**	**3,085,428**	**28,283,087**	**57,423,237**	**231,194**
LARGE-SCALE FLEET	**1,956,540,055**	**71,229,515**	**652,937,220**	**1,325,660,417**	**4,953,048**

NOTE: The figures for the proposed tax rate by the Commission in the revised ETD are €0.0351/litre (or 3.51 cents/litre) - a difference of 0.09 of 1 cent per litre, to the figures we have listed in the report (€0.036/litre). This came from a difference in the conversion from gigajoule to marine fuel. We have not updated every figure in the report to account for this since the difference is so tiny and does not significantly influence the tax revenue that the Commission proposes.

Using alternative subsidies to do good

Rather than being lost on fuel tax exemptions, tax revenue could support alternative subsidies with greater positive environmental, social, and economic impacts (Figure A). In 2019, €0.33 tax per litre could simultaneously pay for numerous safety at sea measures (5,049), protection of aquatic species projects (3,267), and professional training initiatives (3,172). At the same time, more costly projects, including energy reduction & decarbonisation (99) and fisheries management projects (86), could also be subsidised.

Focusing on areas of crucial concern for the EU, the tax revenue could have been invested into supporting 20,328 jobs for fishers for a year or enabling 6,427 energy reduction & decarbonisation initiatives.

For a full analysis and descriptions of alternative subsidies, click the link here.

Spanish fleet tax exemptions and alternative subsidies

In 2019, a tax rate of €0.33 would have generated €193 million in revenue. This revenue could have been equally divided between six alternative subsidies: supporting 3% of Spanish fishers' salaries and professional training initiatives for 9% of all fishers. In addition, it could have financed decarbonisation measures for 1% of the fleet, regenerative practices for 2%, and low-impact fishing equipment for 4%. On average, these alternative subsidies have an impact score of 7.7, which is a 192% improvement compared to using fuel subsidies (this impact score remains the same for France and Germany).

French fleet tax exemptions and alternative subsidies

In 2019, a tax rate of €0.33 would have generated €109 million in revenue. This tax revenue could have been equally divided between six alternative subsidies: supporting 7% of French fishers' salaries and professional training initiatives for 19% of all fishers. It could have also financed measures to reduce energy use and promote decarbonisation for 1% of the fleet, regenerative practices for 2%, and low-impact fishing equipment for 3%.

German fleet tax exemptions and alternative subsidies

In 2019, a tax rate of €0.33 would have generated €12 million revenue. This tax revenue could have been equally divided between six alternative subsidies: supporting 6% of German fishers' salaries and professional training initiatives for 16% of all fishers. Additionally, the funding could have been used to reduce energy consumption and promote decarbonisation for 1% of the fleet, adopt regenerative practices for 1%, and acquire low-impact fishing equipment for 2%.

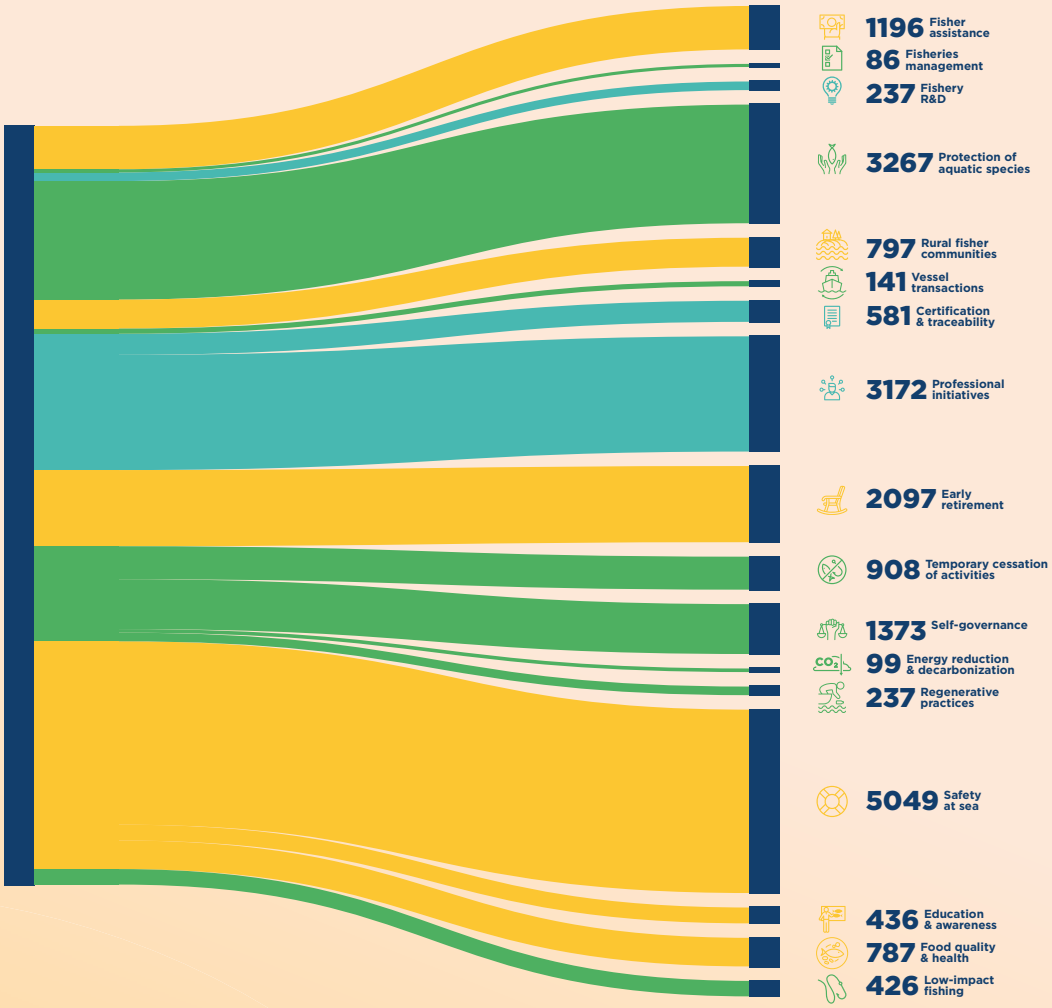

Figure A. Fuel taxes could be equally distributed to the 17 alternative subsidies. The number of initiatives for each subsidy that could be financed with €0.33 per litre tax is referenced next to the subsidy. The colours indicate environmental-focused (green), social-focused (yellow), and economic-focused (blue) subsidies.

2. INTRODUCTION

The EU fishing fleet is exempted from paying fuel taxes; these fuel-tax exemptions are indirect capacity-enhancing subsidies. High fuel prices and taxation can incentivise faster decarbonisation of industries[1], hence such indirect subsidies stand in the way of a more environmentally friendly EU fishing fleet.

With this exemption, the EU currently provides fuel tax subsidies to its fishing fleet to the tune of between €700 million and €1.4 billion each year. But under the European Green Deal and Fitfor55 package, every industry in the EU should both reduce emissions and cut fossil fuel subsidies[2]. In fact, the European Commission is now proposing to revise the Energy Taxation Directive (ETD)[3], and to include in it a tax rate of €0.036 per litre. This rate is much lower than e.g., the rates used for road transport. Yet a number of EU Member States are currently proposing to continue exempting the fishing industry from paying fossil fuel taxes.

Instead of these exemptions, the EU could use the revenue generated from a fossil fuel tax to support the fishing fleet in ways that are not only different but more beneficial to its long term future. Well-designed subsidies can enhance environmental and human well-being[4]. Instead of fueling carbon pollution and potentially unsustainable fishing, the EU could use the tax revenue from fossil fuel taxes to support decarbonisation, create sustainable jobs and increase the transparency of fish catches and trade.

This report calculated the exempted taxes for the EU large and small-scale fleets over the period 2010-2020 for three different scenarios of taxation: the European Commission proposed tax rate of €0.036 per litre, and two higher taxation rates used for land-based activities. Tax scenarios then illustrate what could be done with the vast tax revenue generated to support the fishing industry in achieving a just transition to low-impact and low-carbon fishing in the EU.

1 - Papadis, E., Tsatsaronis, G. 2020. Challenges in the decarbonisation of the energy sector Energy, 205, p. 118025

2 - European Commission, 2021.'Fit for 55': delivering the EU's 2030 Climate Target on the way to climate neutrality. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, COM(2021) 550 final, Brussels

3 - COUNCIL tDIRECTIVE 2003/96/EC of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity. https://eur-lex.europa.eu/legal-content/EN/TXT/ PDF/?uri=CELEX:32003L0096&from=EN

4 - Green, R., Staffell, I 2020. The Contribution of Taxes, Subsidies and Regulations to British Electricity Decarbonisation

3. METHODS

The year 2019 is used as a reference year throughout the report because the year 2020 is not representative due to Covid-19 restrictions.

Tax scenarios: To assess possible levels of taxation for fuel in the EU fleet that could be spent on subsidies more beneficial to the environment and people, we used scenarios of taxation from a previous Our Fish and ClientEarth report[5]. We compared the current tax rate of 0% to three tax rate reference points: the proposed tax rate by the EU Council (€0.036 per litre, scenario 1), and the minimum level of taxation applicable to motor fuels specified in the EU Council Regulation on the taxation of energy products (€0.33 per litre, scenario 2)[6]. The third scenario is based on average excise duties for gas oil for road transport published by the EU Commission between 2008-2018 (€0.67 per litre, scenario 3)[7]. We corrected € values for inflation using 2020 as the reference year.

Large versus small-scale: The distinctions between large and small-scale fleets for the EU fleet and three country case studies are taken from the STECF Annual Economic Report[8]. Vessels in the small-scale feet are smaller than 12 metres and use passive gear. The large-scale fleet was defined as all the other vessels that did not meet the small-scale fleet criteria. Not all fleet segments and annual data was available, so these data are not entirely complete, as a result, the total litres consumed, CO_2 emissions, and tax revenue stated here may be underestimations.

CO_2 emissions: Following the approach in the previous Our Fish report[9], we calculated CO_2 emissions from litres of fuel consumed, using a conversion factor of 3.17 of CO_2 per tonne of fuel and assuming a mean density of diesel of 0.86[10].

Profitability: Median gross profit margin is also compared in the three scenarios of taxation to gauge the economic impact on fleet segments from scenarios of taxation. Gross profit margin is calculated as the proportion of revenue minus cost divided by revenue.

Case studies: We compare the large- and small-scale fleet fuel consumption, CO_2 emissions, and tax amounts in the three scenarios for three countries: Spain, France, and Germany.

Literature review: The literature review included global and EU fishing subsidies, encompassing searches in peer-reviewed, non-peer-reviewed, and regulatory literature databases. The global fishing subsidies review was used to establish a state-of-the-art baseline that can provide lessons for EU subsidies. First, we conducted searches on Scopus academic databases[11] by entering search terms for the title, abstract, and keywords for several prompts (EU AND fish* AND subsid*; global AND fish* AND subsid*). The period of the Covid-19 pandemic was characterised by an increase and diversification of subsidies. Thus, we specifically prompted for publications of these subsidies (fish* AND subsid* AND Covid). We identified a total of

5 - Green, R., Staffell, I 2020. The Contribution of Taxes, Subsidies and Regulations to British Electricity Decarbonisation

6 - Annex 1, Table A in COUNCIL DIRECTIVE 2003/96/EC of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity. https://eur-lex.europa.eu/legal-content/EN/TXT/

7 - European Commission: Weekly Oil Bulletin - 2005 Onwards, 2019

8 - STECF (Scientific, Technical and Economic Committee for Fisheries). 2020. The 2020 Annual Economic Report on the EU Fishing Fleet; Publications Office of the European Union: Luxembourg.

9 - STECF (Scientific, Technical and Economic Committee for Fisheries). 2020. The 2020 Annual Economic Report on the EU Fishing Fleet; Publications Office of the European Union: Luxembourg

10 - Sala, A. et al., 2022. Energy audit and carbon footprint in trawl fisheries Scientific Data, 9, p. 428,

11 - Where necessary we complemented the searches with google scholar.

335 publications and included 48 publications by investigating the title and abstracts for relevance to case study analyses of subsidies, impact assessments of subsidies, and evolution of subsidies analyses. We excluded publications that explained the political influence on subsidies, opinion papers, and optimization of subsidies analyses. We identified existing classifications of subsidies6 and added subsidies that were not captured in these. One subsidy category may contain multiple types of subsidies. For instance, the category energy reduction & decarbonisation contains Fuel Efficient Gear, Electrification of Ports, Fuel Efficient Equipment, Fuel Efficiency R&D, and Fuel Management Systems, whereas the fisher assistance category primarily refers to direct payments that support fisher income. We excluded a suite of capacity-enhancing subsidies that have similar issues as those identified for fuel subsidies. In total, we recorded 17 subsidy categories, herein referred to as alternative subsidies.

Impact scores: The literature review yielded studies on impact assessments of subsidies, including economic theory and empirical cases of the implications of subsidies on the environment, society, and economy. We created impact scores divided into three categories to assess the environmental, social, and economic dimensions.

Following global subsidy assessments, the environmental[12] impact score focuses on impacts that benefit the ecosystem or that alter fishing capacity, which is directly linked to harvesting and overharvesting. The three categories are beneficial (3), ambiguous (2), and capacity-enhancing (1). The social impact score focuses on fisher well-being and welfare, represented by fisher income. The three categories are beneficial (3), ambiguous (2), and income-damaging (1). The economic impact score focuses on the profitability of the fishery. The three categories are profit-enhancing (3), ambiguous (2), and support unprofitable fisheries (1). If a subsidy had no direct impact on a dimension as defined here, it was assigned a value of two. The total impact score is the sum of environmental, social, and economic impact scores.

Cost of alternative subsidies: The databases of multiple EU Member States were reviewed to identify recipients of European Maritime, Fisheries, and Aquaculture Fund funding[13]. All Member States offered information on the beneficiary name, operation name, operation summary, start and end date, total eligible expenditure, and amount of EU contribution. Each data point was assigned to one subsidy category. The average of all data points' total eligible expenditure was then used to determine the cost of a subsidy category.

12 - Sumaila, U.R., et al., 2019. A global dataset on subsidies to the fisheries sector. Data in Brief 27, 104706. https://doi.org/10.1016/j.dib.2019.104706
13 - https://oceans-and-fisheries.ec.europa.eu/funding/recipients-eu-funding_en (Ireland, France, German states)

4. EU FLEET FUEL SUBSIDIES OVERVIEW

4.1. EU fuel consumption and tax exemption estimates

The EU large-scale fleet used an estimated 21 billion litres of fuel over 2010-2020, with an average of 1.9 billion litres per year, resulting in an estimated 56 million tons of CO_2 emissions (Table 1). The estimated tax exemption at the scale of the EU large-scale fishing fleet was €0.8 billion over 2010-2020 based on the proposed tax rate of €0.036 per litre (scenario 1), while it was €7.4 billion and €15 billion for tax rates of €0.33 per litre (scenario 2) and €0.67 (scenario 3), respectively (Table 1). In 2019, this would have been €71 million for the lowest tax scenario, while it would have been €653 million under scenario 2 and €1.3 billion under scenario 3.

Year	Litres	Taxes of €0.036 per litre (scenario 1)	Taxes of €0.33 per litre (scenario 2)	Taxes of €0.67 per litre (scenario 3)	Tonnes of CO_2 year 2019	Energy costs
2010	2,112,205,091	85,727,076	785,831,535	1,595,476,146	5,757,906	1,206,157,634
2011	1,975,365,180	79,080,839	724,907,687	1,471,782,274	5,385,018	1,452,648,352
2012	2,007,468,321	77,924,178	714,304,970	1,450,255,544	5,189,270	1,552,837,700
2013	2,013,833,225	76,383,522	700,182,282	1,421,582,209	5,208,086	1,479,846,320
2014	1,956,346,845	73,420,189	673,018,396	1,366,431,290	5,062,794	1,322,517,216
2015	2,058,636,431	77,097,297	706,725,218	1,434,866,352	5,343,761	1,096,402,019
2016	2,010,772,262	75,469,261	691,801,560	1,404,566,804	5,218,701	907,854,467
2017	1,389,576,082	52,139,188	477,942,559	970,368,226	3,692,352	776,298,365
2018	1,944,672,660	71,879,741	658,897,630	1,337,761,854	5,301,567	1,133,591,327
2019	1,956,540,055	71,229,515	652,937,220	1,325,660,417	5,331,073	1,013,792,759
2020	1,816,832,249	65,466,104	600,105,957	1,218,396,943	4,953,048	708,214,852
TOTAL	21,242,248,401	805,816,910	7,386,655,014	14,997,148,059	56,443,576	12,650,161,011

Table 1. Fuel consumption, CO_2 emissions and tax estimates under three scenarios for the EU large-scale fleet, which includes vessels 12 metres or longer using active & passive gear and small-scale vessels 12 metres or smaller using active gear (AER definition of large-scale4). All € amounts (tax scenarios and costs) are in 2020 value.

For the EU small-scale fleet (<12 metres using passive gear) these numbers are substantially lower (Table 2). The small-scale fleet used 0.9 billion litres of fuel cumulatively over 2010-2020, corresponding to 2.4 million tonnes of CO_2 emissions. The estimated tax exemption at the scale of the EU small-scale fishing fleet was €36 million over 2010-2020 based on the proposed tax rate of €0.036 per litre (scenario 1), while it was €0.33 billion and €0.67 billion for tax rates of €0.33 per litre (scenario 2) and €0.67 per litre (scenario 3) respectively (Table 2). In 2019, this would have been €3.1 million for the lowest tax scenario, while it would have been €28 million under scenario 2 and €57 million under scenario 3.

Year	Litres	Taxes of €0.036 per litre (scenario 1)	Taxes of €0.33 per litre (scenario 2)	Taxes of €0.67 per litre (scenario 3)	Tonnes of CO_2 year 2019	Energy costs
2010	100,667,569	4,078,893	37,389,851	75,912,728	273,766	70,701,066
2011	94,066,269	3,753,418	34,406,333	69,855,282	255,901	81,170,554
2012	93,609,283	3,608,284	33,075,941	67,154,183	222,765	91,584,161
2013	92,557,493	3,493,312	32,022,029	65,014,422	199,342	86,062,558
2014	81,273,412	3,051,656	27,973,512	56,794,705	218,692	74,832,512
2015	88,954,899	3,331,038	30,534,515	61,994,318	281,987	59,359,845
2016	87,841,721	3,290,835	30,165,992	61,246,105	215,080	57,599,778
2017	65,726,651	2,460,852	22,557,814	45,799,197	162,492	47,981,842
2018	81,832,896	3,022,280	27,704,230	56,247,982	223,093	60,569,748
2019	84,804,624	3,085,428	28,283,087	57,423,237	231,194	55,895,298
2020	77,787,630	2,802,790	25,692,242	52,163,037	212,065	47,090,363
TOTAL	949,122,447	35,978,786	329,805,546	669,605,196	2,438,559	732,847,725

Table 2. Fuel consumption, CO_2 emissions and tax estimates under three scenarios for the EU small-scale fleet of vessels of less than 12 metres, using passive gear1. All in € amounts (tax scenarios and costs) are in 2020 value.

4.2. Estimated CO_2 consumption

Cumulative CO_2 emissions are most strongly linked to vessel size, with larger vessels having much higher emissions due to fuel use (Figure 1). The correlation between profit margin and fuel use is positive but nearly absent (correlation coefficient = 0.008); however, this could be a complex relationship, because depleted stock status increases fuel use (fishers have to go further to catch the same amount, which results in lower catch per unit effort) and decreases profitability[14]. Regarding fuel efficiency, we should note here that the small-scale fleet uses more fuel on average per tonne of fish[15]; however, the species caught differ between the large-scale fleet (LSF) and small-scale fleet (SSF), so a fair analysis would look at fuel use per CO_2 emissions compared with fuel use per species fished[16].

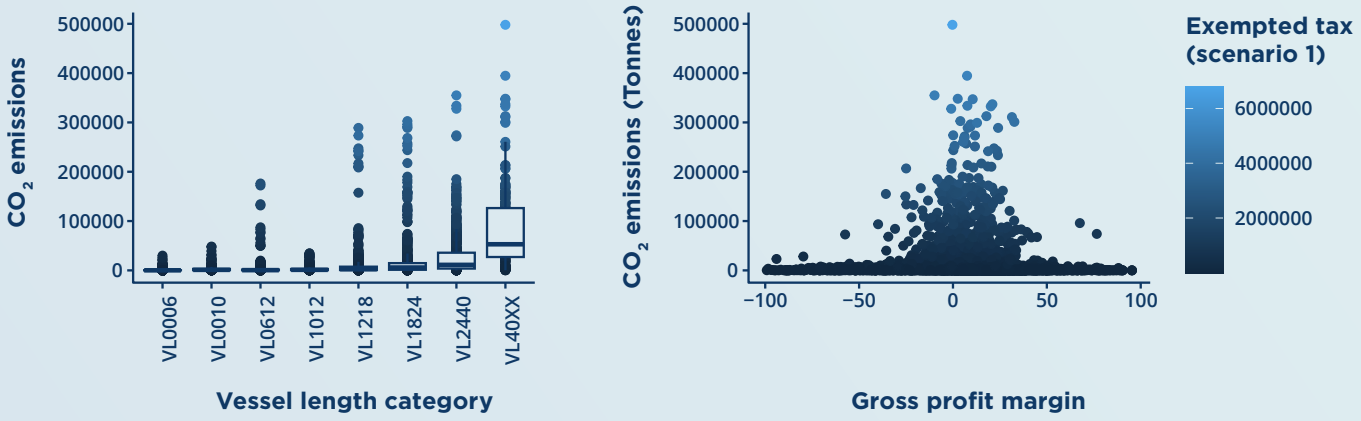

Figure 1. Figure illustrating the level of subsidies for different vessel lengths in the European fleet. The axes show average carbon emissions together with vessel length (left) and fleet segment gross profit margins (right). A few very negative gross profit margins were deleted from this figure to increase readability and due to the low reliability of the data (e.g., very low catches but high fuel consumption).

14 - Byrne C., et al., 2021. Fuel Intensity in Icelandic fisheries and opportunities to reduce emissions, Marine Policy, 127

15 - Scientific, Technical and Economic Committee for Fisheries. 2021. The 2021 Annual Economic Report on the EU Fishing Fleet (STECF 21-08)

16 - Da-Rocha, J.M.,et al., 2019. Blue Growth accounting in small-scale European Union fleets. Marine Policy, 100

4.3. Current and projected fleet profitability with different taxation rates

The median profitability of the EU large-scale fleet segments for scenario 1 is well above zero. However, for tax scenario 2, median profitability dips slightly below 0 in the year 2020, which is not a representative year due to Covid-19 restrictions[17]. With the third tax scenario (€0.67 per litre) median profitability goes considerably below zero for the large-scale fleet segments (Figure 2). Median profitability for the small-scale fleet with all scenarios is well above zero for tax scenarios 1 and 2. The median profitability of the small-scale fleet is still positive and above zero in some of the recent years for tax scenario 3 (€0.67 per litre), the small-scale fleet thus relies less on the fuel tax exemption than the large-scale fleet.

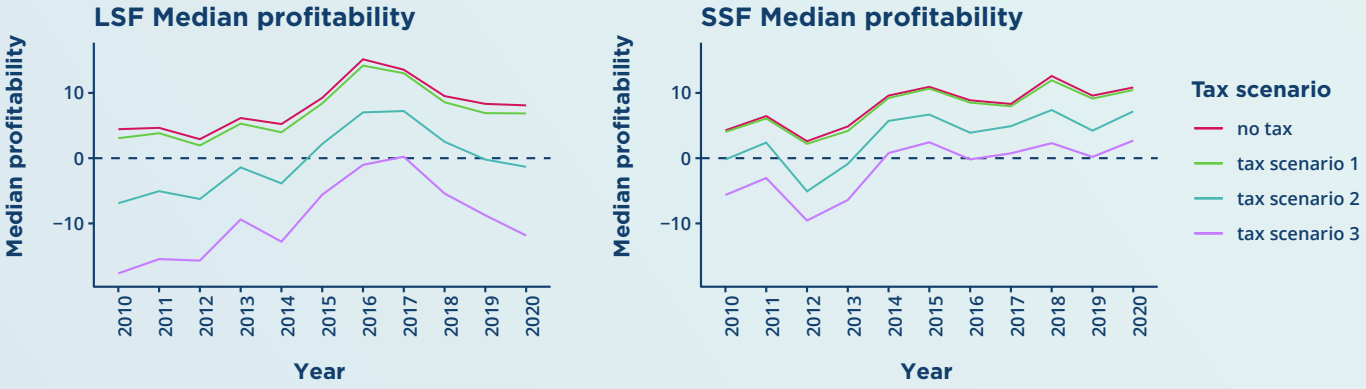

Figure 2. Median (mid value, meaning there is an equal amount of fleet segments with higher and lower profitability than the median) profitability of the large (left panel) and small-scale (right panel) EU fleets, and median profitability under the three tax scenarios.

17 - Carpenter et al., 2023. The economic performance of the EU fishing fleet during the Covid-2019 pandemic, Aquatic living resources 36(2).

5. REVIEW OF GLOBAL AND EU FISHING SUBSIDIES

5.1. Alternative subsidies

A set of seventeen alternative subsidies are used to support the fishing industries around the world with differential - and mostly better - environmental, social, and economic impact profiles than fossil fuel subsidies (Table 1). Eleven of the seventeen alternative subsidies were associated with a beneficial environmental impact, while an ambiguous environmental impact was linked to six alternative subsidies. None of the subsidies were capacity-enhancing[18]. Nine of the alternatives were associated with a beneficial social impact, while an ambiguous social impact was linked to eight alternative subsidies. None of the alternative subsidies were linked to an income-damaging impact. A profit-enhancing economic impact was associated with five, and an ambiguous economic impact was linked to nine of the seventeen alternative subsidies, while three subsidies were linked to supporting unprofitable fisheries.

Fisher assistance:

Payments to fishers income support programs, unemployment insurance, and other direct payments to fishers. Subsidies for fisher assistance likely increase fishers' welfare and artificially make unprofitable fishing more economically profitable by reducing labour costs. Fisher assistance can improve social welfare but encourage fishers to remain in the fishing industry even in unprofitable fisheries.

Fisheries management:

These are programs that ensure appropriate management, including research, monitoring, enforcement; resource surveys; and fishery habitat and stock enhancement programs. Supports fisher welfare and profitability by maintaining fish population health in the long term. Can limit fishing opportunities.

Fishery Research and Development (R&D):

Subsidies for fishery R&D are initiatives towards improving methods for fish catching and processing[19]. Scientific and technological breakthroughs can enhance profitability and fisher income if the breakthroughs reduce costs or increase efficiency. Only targeted strategies that enhance the fishery resource base will be environmentally beneficial.

Protection of aquatic species:

These programs aim to improve population resilience by setting up and enforcing areas where commercial fishing is prohibited. They allow new generations of juveniles to replenish the population, but fishery closures reduce income opportunities.

Rural fisher communities:

Multi-stakeholder programs geared towards improving integrated livelihood development policy objectives. They improve social welfare but are unsustainable if they promote excess rural labour to enter the fishery and make unprofitable fishing viable through capital injections.

Vessel transactions:

These are fishing capacity reduction programs, including permit and vessel buybacks, licence retirements and cessation, and vessel transfer to third countries. They can be beneficial if not

18 - For an assessment including capacity-enhancing subsidies in EU fisheries, see: Skerritt, D.J., et al., 2020. A 20-year retrospective on the provision of fisheries subsidies in the European Union. ICES Journal. https://doi.org/10.1093/icesjms/fsaa142

19 - Sumaila, U.R., et al., 2010. A bottom-up re-estimation of global fisheries subsidies. J Bioecon 12, 201–225. https://doi.org/10.1007/s10818-010-9091-8

anticipated by fishers, but capacity-enhancing when expected because of effort increases in anticipation of the buyout. One-time injection of funds increase fishers' income in the short-term but can exacerbate reduced income and support unprofitable fisheries if funds are used to enhance capacity.

Certification & traceability:

Subsidies that support sustainability certification projects and efforts for enhanced traceability, including improved management and digital monitoring. Certifications are for the most part designed for fishery habitat and stock enhancements. They may or may not pursue social objectives. Traceability and certification increase profitability and income by improving access to new market segments.

Professional initiatives:

These are training opportunities designed to enhance fishers occupational mobility. Subsidies for professional initiatives to develop new professional skills and lifelong learning can enable fishers to diversify their income and possibly shift to alternative occupations in times of crisis. Thus, they may reduce fishing pressure and reduce competition in the fishery.

Early retirement:

Payments to fishers based on the condition of retirement. Encourages fishers to leave the fishing industry, thereby reducing pressure on overexploited fish populations. Improves social welfare while supporting profitability by reducing competition through early retirement of fishers.

Temporary cessation of activities:

These are temporary fishing capacity reduction programs that can serve to protect populations. During the Covid-19 pandemic, they were used as a compensation scheme for lost income. They reduce pressure on overexploited fish populations and improve social welfare but can make unprofitable fisheries viable.

Self-governance:

Subsidies that support communities in their self-governing capacity, for instance, by distributing territorial user rights and negotiating fishing rules. Improves marine population health and empowers the community and fishers in making rules that do not decrease their welfare and that maintain profitability.

Energy reduction & decarbonisation:

Programs geared towards reducing the carbon footprint of fisheries operations, including fuel-efficient equipment and electrification of harbours. Care must be taken to ensure that the reduction of the carbon footprint of fisheries[20] occurs through replacing fishing capacity, otherwise it risks overcapacity and reduced profitability.

Regenerative practices:

These are programs that use the fishing fleet to improve environmental conditions, for instance, by collecting marine litter or population monitoring. Subsidies for regenerative practices may, for instance, encourage the targeted removal of invasive species[21] or the removal of lost gear and litter[18] and are associated with benefits for the environment. Engaging the fishing fleet in regenerative practices reduces pressure on overexploited fish populations and increases the health of ocean-dependent communities.

20 - Parker, R., et al., 2018. Fuel use and greenhouse gas emissions of world fisheries. Nat Clim Change 8, 333–337. https://doi.org/10.1038/s41558-018-0117-x

21 - Vaughan, D., et al., 2021. Marinising a terrestrial concept: Public money for public goods. Ocean & Coastal Management 213, 105881. https://doi.org/10.1016/j.ocecoaman.2021.105881

Safety at sea:

Subsidies that invest in fisheries safety training and equipment and onboard improvements, including anti-slip paint & matting, hygiene measures, and personal protective equipment. These subsidies also are likely to reduce occupational risks and improve fishers' health. Such subsidies likely do not affect profits or the environment.

Education & awareness:

These are initiatives that educate and raise citizen awareness regarding fisheries and the marine environment, including seafood festivals, fairs or training. They enhance fishing literacy and empower citizens to actively participate in fishery decision-making for better protection of the environment and social welfare.

Food quality & health:

Subsidies that invest in the improvement of seafood quality are likely to reduce the prevalence of toxic and parasitic contaminants. They improve food safety and health of seafood consumers and reduce food waste. These subsidies are unlikely to affect profits or the environment.

Low-impact fishing:

These are support programs that promote use of selective gear and avoidance of wildlife incidents, resulting in reduced by-catch and better use of fishery bycatch. By-catch usage can improve catch per unit effort and thereby improve profitability.

Fuel subsidies were associated with the lowest total impact scores, while professional initiatives, self-governance, and regenerative practices were associated with the highest scores (Table 3). Thus, these alternative subsidies are likely to be most effective at delivering a more sustainable, equitable, and resilient fishing industry while also promoting broader environmental and social goals.

Subsidy category	Environmental Impact Score	Social Impact Score	Economic Impact Score	Total impact score
FUEL SUBSIDIES	1	2	1	4
FISHER ASSISTANCE	2	3	1	6
FISHERIES MANAGEMENT	3	2	3	8
FISHERY R&D	2	3	3	8
PROTECTION OF AQUATIC SPECIES	3	2	2	7
RURAL FISHER COMMUNITIES	2	3	1	6
VESSEL TRANSACTIONS	2	2	2	6
CERTIFICATION & TRACEABILITY	3	2	3	8
PROFESSIONAL INITIATIVES	3	3	3	9
EARLY RETIREMENT	3	3	2	8
TEMPORARY CESSATIONS OF ACTIVITIES	3	3	2	8
SELF-GOVERNANCE	3	3	3	9
ENERGY REDUCTION & DECARBONISATION	2	2	2	6
REGENERATIVE PRACTICES	3	3	3	9
SAFETY AT SEA	2	3	2	7
EDUCATION & AWARENESS	3	3	2	8
FOOD QUALITY & HEALTH	2	3	2	7
LOW-IMPACT FISHING	3	2	3	8

Table 3. Impact profiles of fuel and alternative subsidies are composed of their environmental, social, and economic impact score. Scores are based on empirical findings of subsidy impact and economic theory. The environmental impact score can be beneficial (3), ambiguous (2), and capacity-enhancing (1). The social impact score can be beneficial (3), ambiguous (2), and income-damaging (1). The economic impact score can be profit-enhancing (3), ambiguous (2), and support unprofitable fisheries (1). The total impact score is the sum of all impact scores.

5.2. Using alternative subsidies to do good

Dividing fuel tax revenue equally among all subsidies

Instead of subsidising fossil fuel use by the fishing industry, EU Member States can support alternative subsidies for the fishing industry to achieve a just transition to low-impact and low-carbon fishing. A tax of €0.33 per litre (scenario 2) would have generated €681 million in taxes in 2019 alone. Equally divided, this revenue would allow investing €40 million in 17 alternative subsidies (Figure 3). This would enable the implementation of numerous safety at sea measures (n = 5,049), protection of aquatic species projects (n = 3,267) and professional initiatives (n = 3,172). At the same time, more costly subsidies could also be supported, including energy reduction & decarbonisation (n = 99) and fisheries management projects (n = 86). The total impact score averaged for the alternative subsidies is 7.5. Investing in these alternatives instead of fuel subsidies improves the total impact score by 188%.

A portfolio approach to subsidies ensures that multiple objectives can be met. Investing in only one subsidy could not achieve this objective, but helps illustrate the magnitude of the possible investments (Annex Table 1). Investing in a single subsidy category would enable the implementation of numerous safety at sea measures (n = 85,828) and protection of aquatic species projects (n = 55,537). More costly alternatives, such as energy reduction & decarbonisation (n = 1,690) and fisheries management programs (n = 1,463), could also be well-funded.

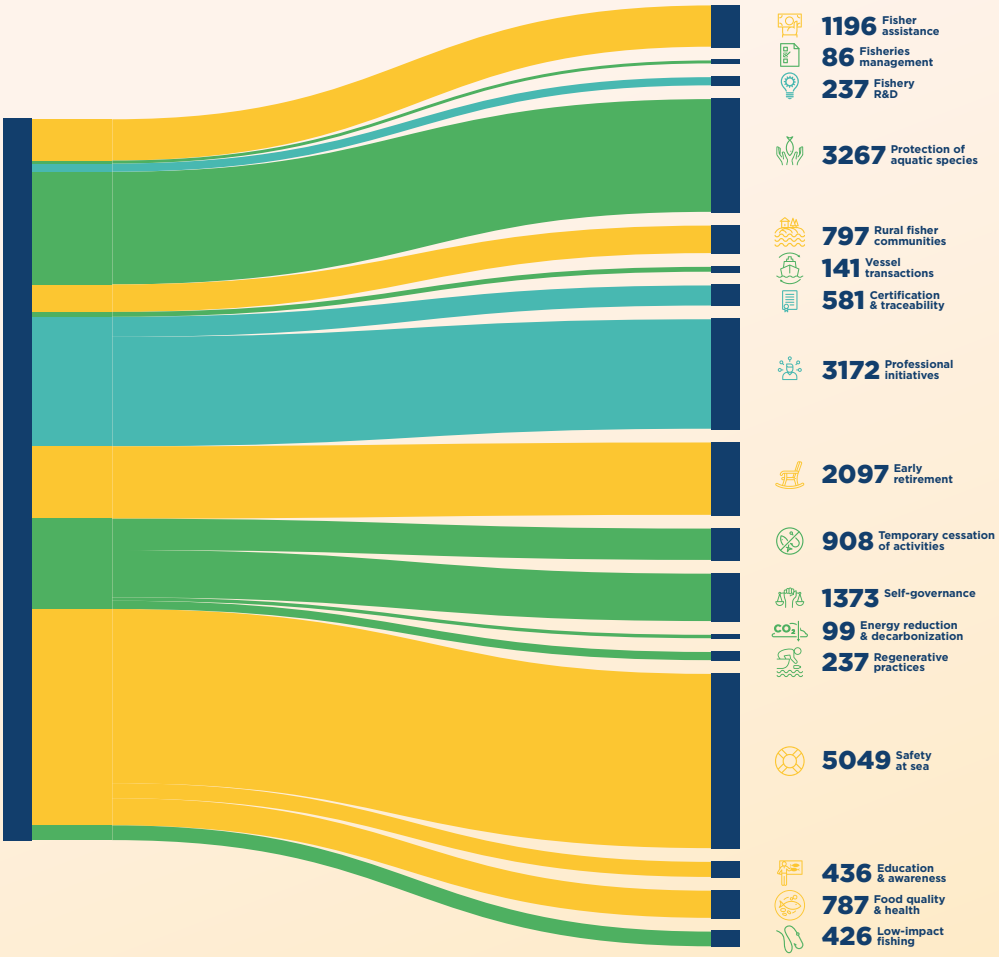

Figure 3. Fuel subsidies could be equally distributed to the 17 alternative subsidies. The numbers next to the subsidies refer to the number of initiatives that could be financed by these subsidies. The thickness of the links indicates the number of subsidy programs that could be financially supported. The colours indicate environmental-focused (green), social-focused (yellow), and economic-focused (blue) subsidies.

Investing in environmental, social, and economic objectives

To avoid subsidising the fishing industry's fossil fuel use, EU Member States could fund alternative fishing subsidies that support environmental, social, or economic objectives (Figure 4). Equally dividing €681 million from fossil fuel taxes in 2019 between eight subsidies (€85 million each) with an environmental objective would allow a high number of protection of aquatic species (n = 6,942) and self-governance (n = 2,919) projects. In addition, more costly subsidies could also be supported, including fisheries management (n = 183) and energy reduction & decarbonisation programs (n = 211). Equally dividing fossil fuel taxes between six subsidies (€114 million) with social objectives would include providing numerous safety at sea measures (n = 14,305) and supporting fishers' early retirements (n = 5,941). In addition, the tax revenue could pay for a smaller number of expensive programs in education & awareness (n = 1,235) and food quality & health (n = 2,229). Finally, equally dividing fossil fuel taxes between three subsidies (€227 million) with an economic objective could support professional initiatives (n = 17,975), certification & traceability (n = 3,290), and fishery R&D programs (n = 1,341).

The total impact score averaged is highest for the subsidies with economic objectives (impact score = 8.3), followed by environmental objectives (impact score = 7.6) and social objectives (impact score = 7). Investing in subsidies with environmental, social, and economic objectives instead of fuel subsidies improves the impact score by 191%, 175%, and 208%, respectively.

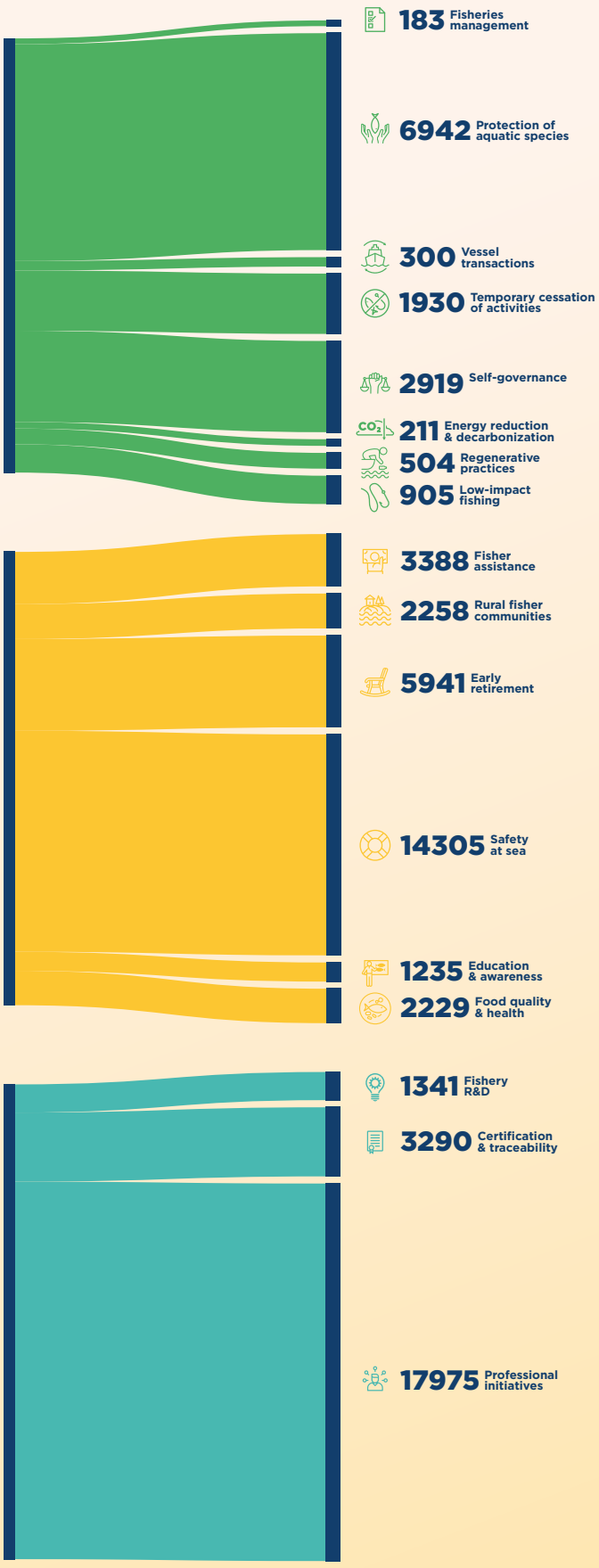

Figure 4. Fuel subsidies could be equally distributed to alternative subsidies for environmental, social, or economic objectives. The numbers next to the subsidies refer to the number of initiatives that could be financed by these subsidies. The thickness of the links indicates the number of subsidy programs that could be financially supported. The colours indicate environmental-focused (green), social-focused (yellow), and economic-focused (blue) subsidies.

Using fuel tax revenue to decarbonise the EU fishing fleet

Energy reduction & decarbonisation subsidies can support the transition to a low-emission EU fishing fleet. Different types of investments were funded by the EU for fishery stakeholders under this subsidy category. A tax rate of €0.33 per litre (scenario 2) would have generated €681 million in taxes in 2019. Investing the tax revenue only in energy reduction & decarbonisation could have channelled €136 million to each: fuel-efficient gears (n = 2,178), equipment (n = 1,541), R&D (n = 590), fuel management systems (n = 2,002), and the electrification of harbours for shoreside power (n = 116). The EU fishing industry faces the dual challenge of climate change and overharvesting. Therefore, any investments to reduce carbon emissions must replace - not increase - fishing industry capacity. The total impact score averaged for the energy reduction & decarbonisation subsidy is six. Investing in these alternatives instead of subsidising fossil fuel use improves the impact score by 150%.

Using fuel tax revenue to support fishers' salaries

Assuming all generated tax revenues from fuel taxation were invested in salary assistance to fishers, a minimum of 2,218 jobs, an intermediate of 20,328 jobs, and a maximum of 41,273 jobs could be supported, using tax scenarios 1-3. Employment in the fisheries sector was 92,298 individuals in 2019[22]. This means every second fisher could have been supported with a one-year full-time salary or nearly two years of pension payments[23]. The total impact score averaged for the fisher assistance subsidy is six. Investing in these alternatives instead of subsidising fossil fuel use improves the impact score by 150%.

20,328 jobs could be supported for a year with taxes of only €0.33 tax per litre.

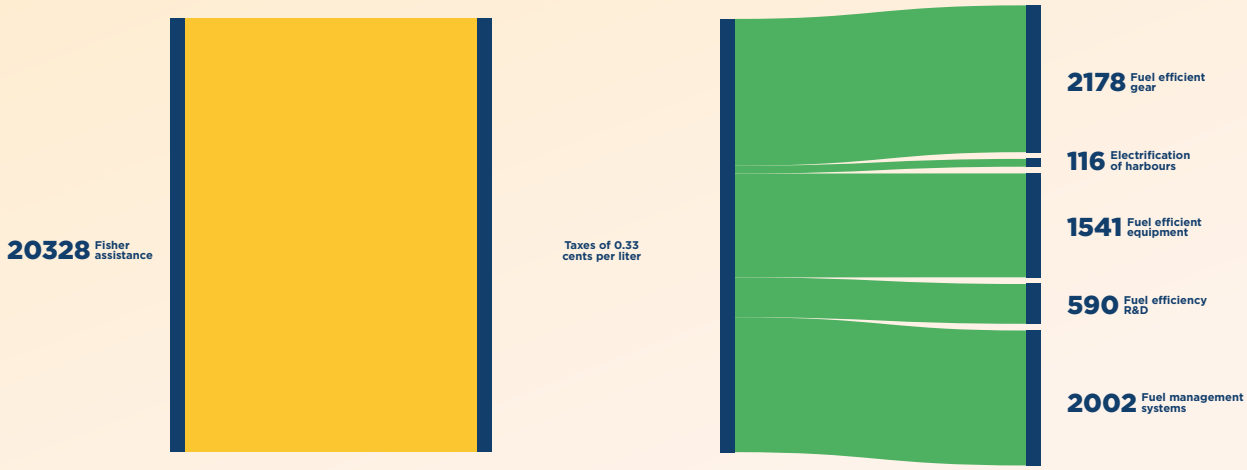

Figure 5. Fuel subsidies could be distributed to individual alternative subsidies. A tax of €0.33 per litre would have generated €681 million in taxes in 2019, this money could be invested in fisher assistance (left) or energy reduction & decarbonisation subsidies (right). The numbers next to the subsidies refer to the number of initiatives that could be financed by these subsidies. The thickness of the links indicates the number of subsidy types that could be financially supported. The colours indicate environmental-focused (green) and social-focused (yellow) subsidies

22 - Calculated as full-time equivalent employment. Source: AERE.

23 - Taking for instance France's replacement earnings in retirement of 60,1%. Source: https://www.oecd-ilibrary.org/social-issues-migration-health/pensions-at-a-glance-2019_90da17a0-en

6. CASE STUDIES SPAIN, FRANCE, AND GERMANY

6.1. Spain

Spain large-scale vessels & small vessels with active gear

The Spanish large-scale fleet (LSF) is one of the largest LSF in Europe[24]. The total amount of fuel consumed by the Spanish LSF in 2019 was 0.56 billion litres with estimated CO_2 emissions of 1.5 million tonnes[25] (Figure 6). While fuel consumption has decreased in recent years, it was relatively stable from 2018-2020. Total revenue generated at a proposed tax rate of €0.036 per litre would amount to €20 million in 2019, while revenue would be €187 million with a tax rate of €0.33 (scenario 2) and €379 million with tax rate of €0.67 (scenario 3) (Figure 6), the latter two being standard rates for land-based fuel taxes[26].

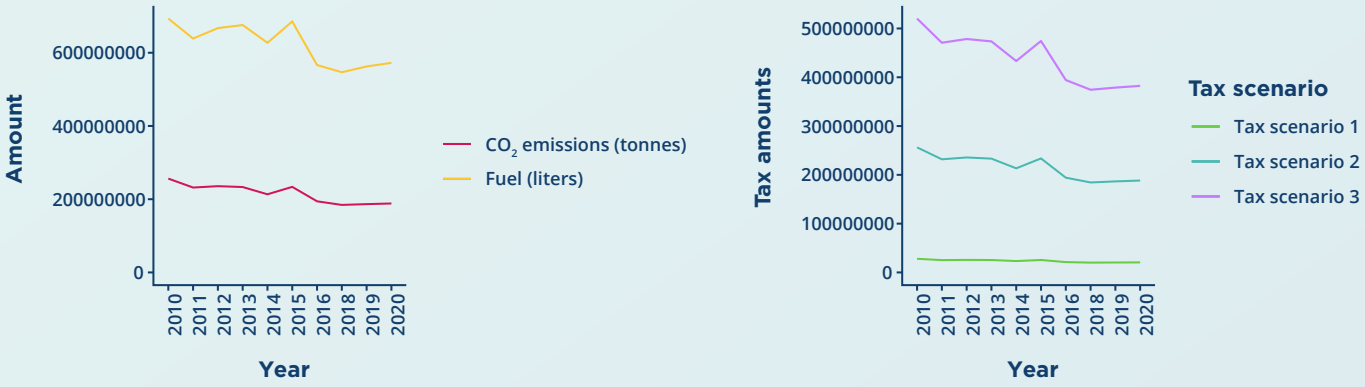

Figure 6. Fuel consumption, CO_2 emissions and amount of taxes (in €) for the three tax scenarios for the Spanish large-scale fleet. € amounts are corrected for inflation and represent 2020 value.

Spain small-scale vessels using passive gear

The total amount of fuel consumed in 2019 by the Spanish small-scale fleet (SSF) was 19.8 million litres, which produced an estimated 53,846 tonnes of CO_2 emissions (Figure 7). Total revenue generated by a proposed tax rate of €0.036 per litre (scenario 1) would have been around €714,602 in 2019, compared to €6.6 million with tax rate of €0.33 (scenario 2) and €13 million with a tax rate of €0.67 (scenario 3).

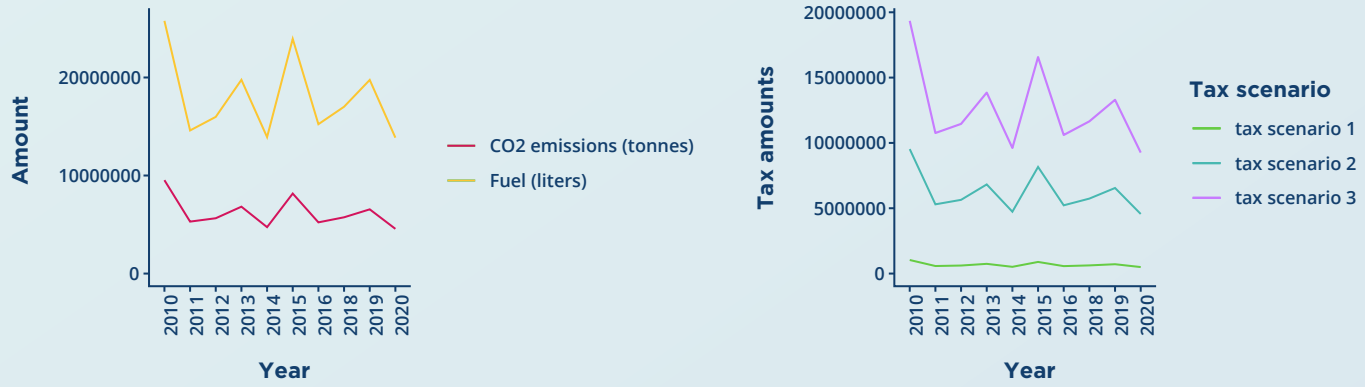

Figure 7. Fuel consumption, CO_2 emissions (tonnes), and amount of taxes (in €) for the three tax scenarios for the Spanish small-scale fleet. € amounts are corrected for inflation and represent 2020 value.

24 - Scientific, Technical and Economic Committee for Fisheries: The 2021 Annual Economic Report on the EU Fishing Fleet (STECF 21-08)

25 - Assuming that 1000 litres are equivalent to 1 tonne.

26 - Our fish & Client Earth (2021) Report: Climate Impacts & Fishing Industry Profits From EU Fuel Tax Subsidies

Alternative subsidies for Spain

Rather than subsidising fossil fuel use, Spain can offer different types of subsidies to the fishing industry that promote a shift towards environmentally sustainable and low-carbon fishing practices. A tax of €0.33 per litre (scenario 2) would have generated €193 million in revenue in 2019. Here we have selected six alternative subsidies based on their high rating to deliver environmental, social, and economic impact to demonstrate the significant benefits that nations could deliver for their fishing industries, instead of funding fossil fuels. If the revenue was equally divided into €32 million among the six selected alternative subsidies (Figure 8), it could support 3% of all employed fishers and provide professional initiatives for 9% of all fishers. In addition, it could finance energy reduction & decarbonisation measures for 1% of the fleet, regenerative practices for 2%, and low-impact fishing equipment for 4%. The total impact score averaged for the alternative subsidies is 7.7. Investing in these alternatives instead of fuel subsidies improves the total impact score by 192%.

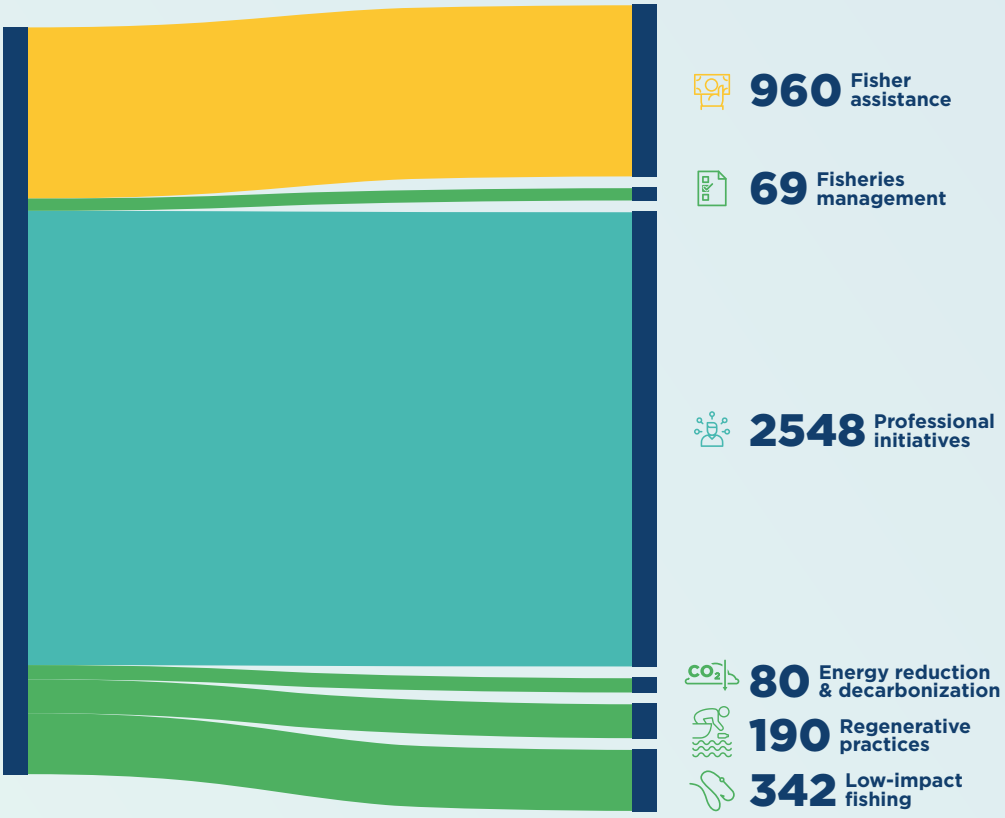

Figure 8. Spain's fuel subsidies could be equally distributed between selected alternative subsidies. A tax of €0.33 per litre would have generated €193 million in taxes in 2019. The numbers next to the subsidies refer to the number of initiatives that could be financed by these subsidies. The thickness of the links indicates the number of subsidy types that could be financially supported. The colours indicate environmental-focused (green), social-focused (yellow), and economic-focused (blue) subsidies.

6.2. France

France large-scale vessels & small vessels with active gear

The total amount of fuel consumed by the French large-scale fleet in 2019 was 0.3 billion litres producing an estimated 815,547 tonnes of CO_2 emissions (Figure 9). While fuel consumption decreased in 2020, it was stable from 2011-2019, and 2020 is not an entirely representative year, due to Covid-19 impacts on fishing[27]. Total revenue generated by a proposed tax rate of €0.036 per litre (scenario 1) would have amounted to €11 million in 2019, while it would have generated €100 million with tax rate of €0.33 (scenario 2) and €204 million with a tax rate of €0.67 (scenario 3).

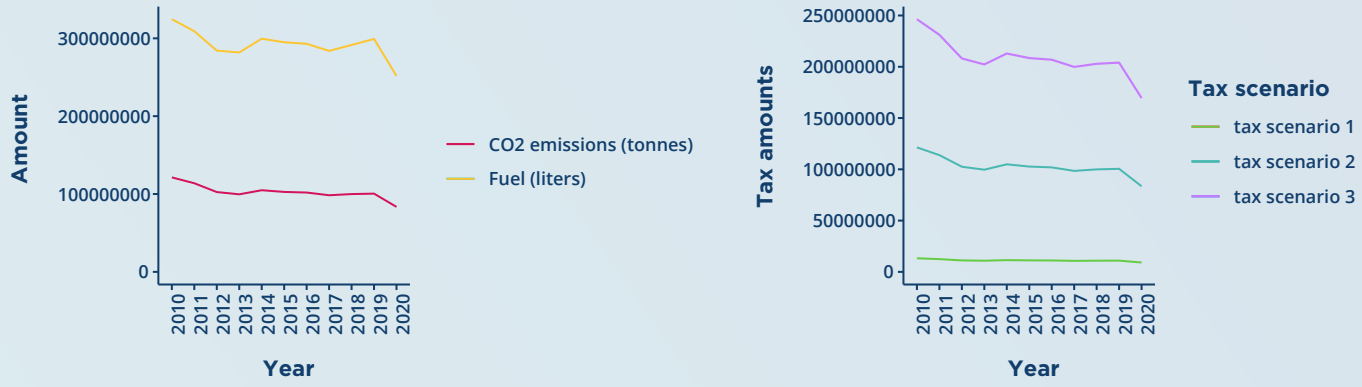

Figure 9. Fuel consumption, CO_2 emissions (tonnes) and amount of taxes (€) for the three tax scenarios for the French large-scale fleet. € amounts are corrected for inflation and represent 2020 value.

France small-scale vessels using passive gear

Total amount of fuel consumed in 2019 by the French SSF was 25.8 million litres which produced an estimated 70,297 tonnes of CO_2 emissions (Figure 10). Total revenue generated by a proposed tax rate of €0.036 per litre (scenario 1) would have been around €944,996 in 2019, while it would have generated €8.7 million with a tax rate of €0.33 (scenario 2) and €18 million with a tax rate of €0.67 (scenario 3).

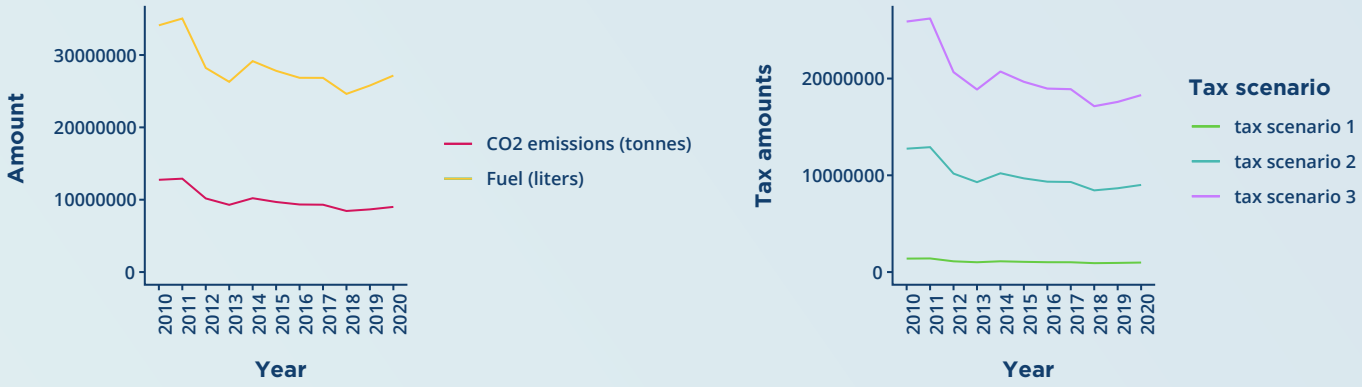

Figure 10. Fuel consumption, CO_2 emissions (tonnes) and amount of taxes (€) for the three tax scenarios for the French small-scale fleet. € amounts are corrected for inflation and represent 2020 value.

27 - Carpenter et al., 2023 The economic performance of the EU fishing fleet during the Covid-2019 pandemic, Aquatic living resources 36(2)

Alternative subsidies for France

France can support a just transition in the fishing industry towards environmentally sustainable and low-carbon practices by providing alternative subsidies instead of subsidising fossil fuel consumption. In 2019, a tax of €0.33 per litre (scenario 2) could have generated €109 million in revenue, which could be divided equally into €18 million between the six alternative subsidies shown in Figure 11 to deliver maximum environmental, social and economic benefits for the fishing fleet. This funding could support 7% of all employed fishers, or professional initiatives for 19% of all fishers. It could also finance measures to reduce energy use and promote decarbonisation for 1%, regenerative practices for 2%, and low-impact fishing equipment for 3% of the fleet. On average, these alternative subsidies have an impact score of 7.7, which is a 192% improvement compared to subsidising fossil fuel use.

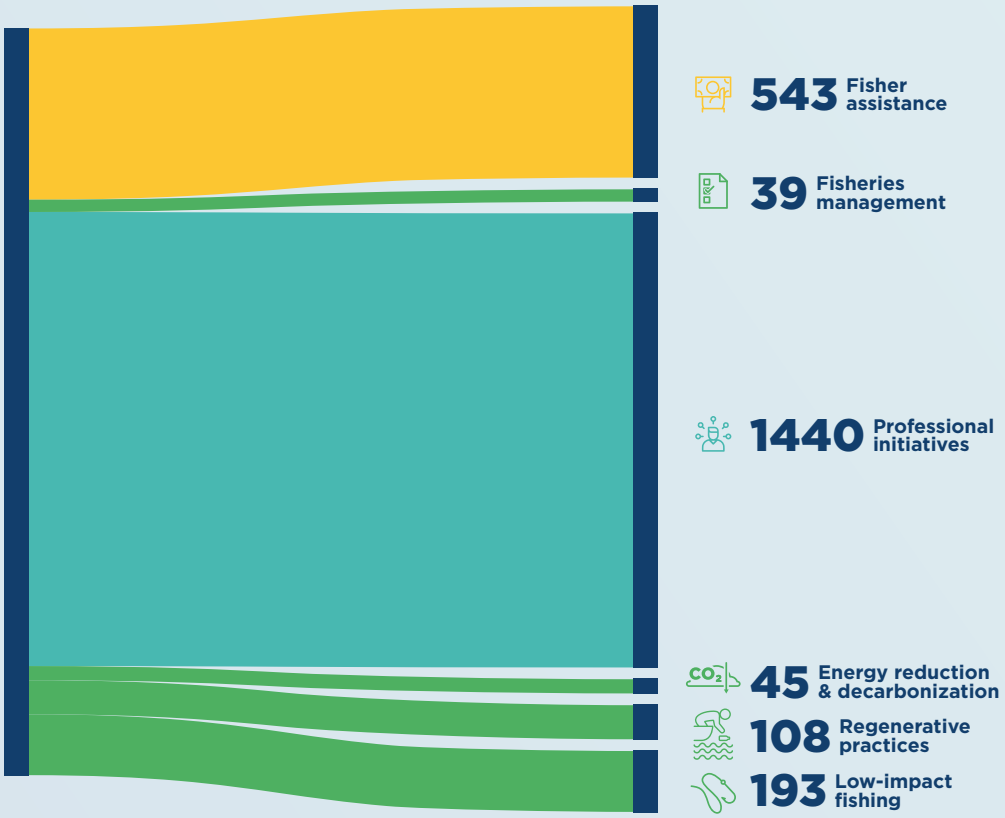

Figure 11. France's fuel subsidies could be equally distributed between selected alternative subsidies. A tax of €0.33 per litre would have generated €109 million in taxes in 2019. The numbers next to the subsidies refer to the number of initiatives that could be financed by these subsidies. The thickness of the links indicates the number of subsidy types that could be financially supported. The colours indicate environmental-focused (green), social-focused (yellow), and economic-focused (blue) subsidies.

6.3. Germany

Germany large-scale vessels & small vessels with active gear

The total amount of fuel consumed by the German large-scale fleet in 2019 was 35.7 million litres and produced an estimated 97,334 tonnes of CO_2 emissions (Figure 12). Total revenue generated by a proposed tax rate of €0.036 per litre (scenario 1) would have amounted to €1.3 million in 2019, while it would have been €12 million with a tax rate of €0.33 (scenario 2) and €24 million with a tax rate of €0.67 (scenario 3).

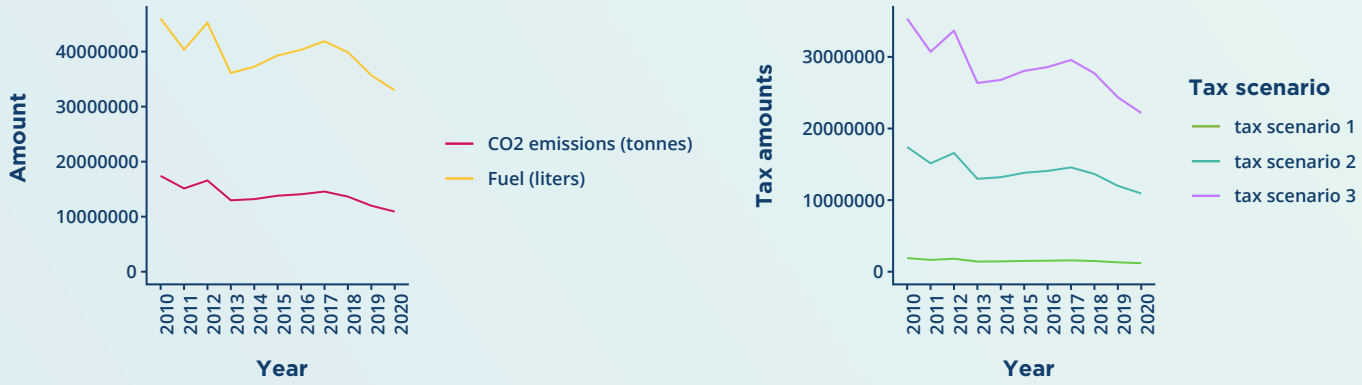

Figure 12. Fuel consumption, CO_2 emissions (tonnes) and amount of taxes (€) for the three tax scenarios for the German large-scale fleet. € amounts are corrected for inflation and represent 2020 value.

Germany small-scale vessels using passive gear

Total amount of fuel consumed in 2019 by the German SSF was 552 thousand litres which produced an estimated 1,506 tonnes of CO_2 emissions (Figure 13). Total revenue generated by a proposed tax rate of €0.036 per litre (scenario 1) would have been around €20,245 in 2019, while it would have been €185,579 with a tax rate of €0.33 (scenario 2) and €377 thousand with a tax rate of €0.67 (scenario 3).

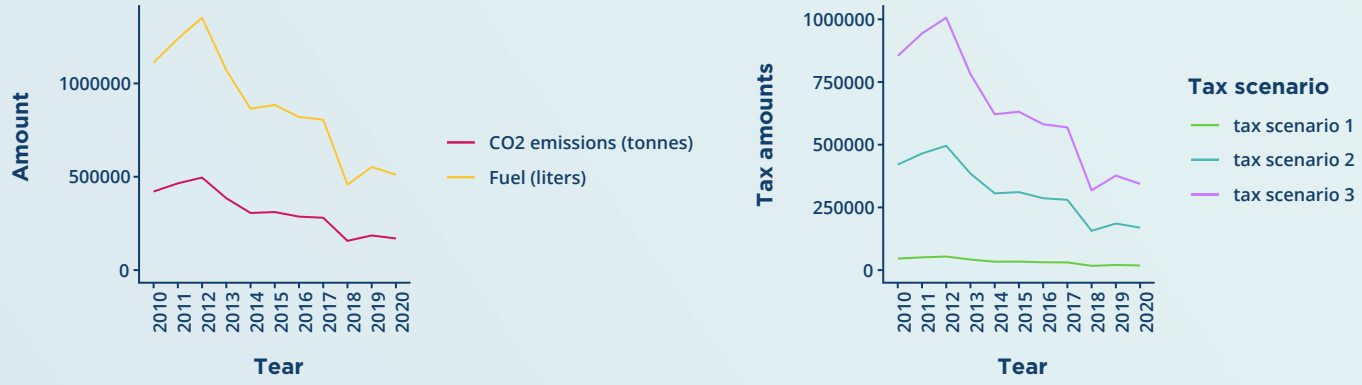

Figure 13. Fuel consumption, CO_2 emissions (tonnes) and amount of taxes (€) for the three tax scenarios for the German small-scale fleet. € amounts are corrected for inflation and represent 2020 value.

Alternative subsidies for Germany

Germany has the opportunity to facilitate environmentally sustainable and low-carbon practices within the fishing industry by providing alternative subsidies rather than subsidising fossil fuel use. In 2019, a tax of €0.33 per litre would have generated €12 million in revenue, which could be distributed equally into €2 million between six alternative subsidies to maximise environmental, social and economic benefits for the fishing fleet (Figure 14). This funding could benefit 6% of all employed fishers and be allocated towards professional initiatives for 16% of all fishers. Additionally, the funding could be used to reduce energy consumption and promote decarbonisation for 1%, adopt regenerative practices for 1%, and acquire low-impact fishing equipment for 2% of the fleet. On average, these alternative subsidies have an impact score of 7.7, representing a 192% improvement compared to using fuel subsidies.

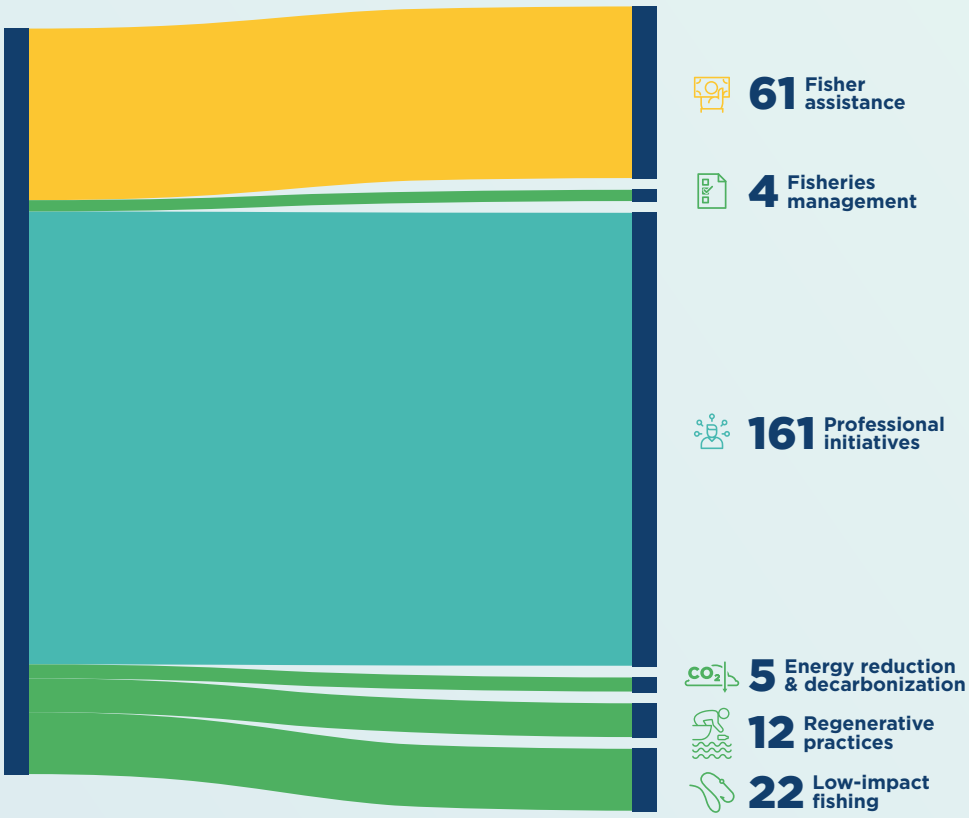

Figure 14. Germany's fuel subsidies could be equally distributed between selected alternative subsidies. A tax of €0.33 per litre would have generated €12 million in taxes in 2019. The numbers next to the subsidies refer to the number of initiatives that could be financed by these subsidies. The thickness of the links indicates the number of subsidy types that could be financially supported. The colours indicate environmental-focused (green), social-focused (yellow), and economic-focused (blue) subsidies.

7. CONCLUSIONS

Between 2010 and 2020, the EU fishing fleet was exempted from paying up to €15.7 billion in fuel taxes. Now that the European Green Deal and Fitfor55 package require industries to reduce carbon emissions and cut fossil fuel subsidies, the European Commission is proposing to revise the Energy Taxation Directive and introduce a fuel tax rate as low as €0.036 per litre for the fishing fleet. This is just one-twentieth of the rate used for road transport (€0.67 per litre). Despite such a preposterously low proposal, some Member States with large fishing industries are proposing to exempt them from fossil fuel taxes altogether.

Fossil fuel subsidies for the EU fishing fleet are inefficient, socially unfair, and environmentally damaging, and the revenue generated by removing them could be repurposed for better use. For example, €0.33 tax per litre in 2019 could have financed numerous safety at sea measures, protection of aquatic species projects, professional initiatives, and supported expensive, high value projects such as energy reduction & decarbonisation and fisheries management. Specifically, this tax revenue could fund 20,000 annual fisher's salaries in the EU or 6,000 energy reduction & decarbonisation projects.

The proposed tax rate of €0.036 per litre is both insufficient to disincentivise fossil fuel consumption, and will not offer the revenue needed to adequately support a transition to low-impact and low-carbon EU fisheries.

The EU fishing fleet is currently very profitable, especially the large-scale fleet, which would be most negatively impacted in the short term by the removal of fuel subsidies. However, removing fuel subsidies need not mean a reduction in overall support for the fisheries sector. Redirecting support to small-scale fisheries, which have significantly smaller CO_2 emissions compared to large-scale fisheries, would result in improved socio-economic conditions for all fishers.

Furthermore, there are seventeen alternative subsidies that outperform fossil fuel subsidies environmentally, socially, and economically, with an average total impact score of 188% above fuel subsidies. With a fuel tax of €0.33 per litre in 2019, Member States could have invested the revenue to pay the annual salaries of 3-7% of fishers in Spain, France, and Germany, train 9-19% of fishers professionally, and support 2-4% of the fishing fleets with low-impact fishing projects - in addition to numerous fisheries management, energy reduction & decarbonisation, and regenerative practice initiatives.

Finally, the EU's commitment to achieving net zero greenhouse gas emissions includes the fisheries sector, which has barely begun its transition compared to other sectors. Removing fuel subsidies is a necessary first step towards achieving this goal, and redirecting revenue would support coastal communities and the environment in a just transition towards low-impact, low-carbon EU fisheries.

Authors

Dr Laura G Elsler
Independent consultant, Stockholm, Sweden

Dr Maartje Oostdijk
Independent consultant, Reykjavik, Iceland

8. ANNEX

Breakdown of fuel efficiencies for different fleet segments: https://marketac.eu/wp-content/uploads/2022/02/STECF-Presentation-Annual-Economic-Report-2021.pdf

Annex Table 1.

Subsidy category	Objective	Cost per unit (€)	Number of projects financed with a tax of €0.33 per litre
FISHERIES MANAGEMENT	environmental	465,705	1,463
ENERGY REDUCTION & DECARBONISATION	environmental	403,095	1,690
VESSEL TRANSACTIONS	environmental	283,716	2,401
FISHERY R&D	economic	169,341	4,023
REGENERATIVE PRACTICES	environmental	169,100	4,029
LOW-IMPACT FISHING	environmental	94,106	7,239
EDUCATION & AWARENESS	social	91,944	7,409
CERTIFICATION & TRACEABILITY	economic	69,018	9,870
FOOD QUALITY & HEALTH	social	50,947	13,371
RURAL FISHER COMMUNITIES	social	50,284	13,547
TEMPORARY CESSATION OF ACTIVITIES	environmental	44,126	15,438
FISHER ASSISTANCE	social	33,511	20,328
SELF-GOVERNANCE	environmental	29,176	23,349
EARLY RETIREMENT	social	19,112	35,644
PROFESSIONAL INITIATIVES	economic	12,633	53,924
PROTECTION OF AQUATIC SPECIES	environmental	12,266	55,537
SAFETY AT SEA	social	7,937	85,828