

INCEPTION IMPACT ASSESSMENT

Inception Impact Assessments aim to inform citizens and stakeholders about the Commission's plans in order to allow them to provide feedback on the intended initiative and to participate effectively in future consultation activities. Citizens and stakeholders are in particular invited to provide views on the Commission's understanding of the problem and possible solutions and to make available any relevant information that they may have, including on possible impacts of the different options.

TITLE OF THE INITIATIVE	<i>FuelEU Maritime – Green European Maritime Space</i>
LEAD DG (RESPONSIBLE UNIT)	<i>DG MOVE.D1 – Maritime transport and logistics</i>
LIKELY TYPE OF INITIATIVE	<i>Legislative proposal</i>
INDICATIVE PLANNING	<i>Q4 2020</i>
ADDITIONAL INFORMATION	

The Inception Impact Assessment is provided for information purposes only. It does not prejudice the final decision of the Commission on whether this initiative will be pursued or on its final content. All elements of the initiative described by the Inception impact assessment, including its timing, are subject to change.

A. Context, Problem definition and Subsidiarity Check

Context

The [European Green Deal communication](#) published by the European Commission in December 2019, emphasised the need to accelerate the transition to a low-emission and climate-neutral economy, including through the shift to sustainable mobility. The Commission has announced a basket of measures as part of this transition including the preparation of a strategy for sustainable and smart mobility, which will be published in 2020 and set the framework for EU measures on the matter. Some key areas of intervention in the maritime sector concern ramping-up the production, deployment and uptake of sustainable alternative transport fuels, regulating access of the most polluting ships to EU ports and obliging docked ships to use shore-side electricity. A revision of the Energy Taxation Directive along with a proposal to extend European emissions trading to the maritime sector are also amongst the measures proposed for 2021 addressing the call for the price of transport to reflect the impact it has on the environment. Moreover, a revision of relevant State aid guidelines including the environmental and energy State aid guidelines, reflecting the policy objectives of the European Green Deal, should ensure a level-playing field in the internal market also in this sector (including for deployment of on-shore charging infrastructures).

By creating a clear pathway for the demand of sustainable alternative fuels (low and zero-emissions sustainable alternative fuels and power) in maritime transport, the 'ReFuelEU Maritime' initiative, announced in the context of the [2020 Commission Work Programme](#), aims to accelerate achievement of low-emission, climate-neutral shipping and ports by promoting the uptake of sustainable alternative energy and power. It is a first concrete step to bring the maritime sector in line with the European ambition of climate-neutrality by 2050. It will build on the impact assessment that the Commission plans to present by summer 2020 to increase the EU's greenhouse gas (GHG) reduction target for 2030 to at least 50% and towards 55 % compared to 1990 levels.

This initiative continues the approach already promoted by the 2016 [Low Emission Mobility Strategy](#). It outlines a clear pathway for the maritime sector to deliver the projections in the [Commission's long-term vision for a prosperous, modern, competitive and climate-neutral economy by 2050](#) as well as the [strategic orientations of Horizon Europe](#). It is also in line with the global strategy for reduction of GHG emissions from ships by the International Maritime Organization, which includes measures to support the development and uptake of low- and zero-carbon alternative fuels. Furthermore, other complementary initiatives are on-going in the context of the European Green Deal, such as the Strategy for Smart Sector Integration, scheduled for Q2 2020, which aim at decarbonising the energy system by further integrating the different sectors, including transport and buildings, where decarbonisation efforts have not been equally successful to date.

Problem the initiative aims to tackle

In 2018, ship traffic to or from ports of the European Economic Area was responsible for more than 138 million tonnes of CO₂ emissions (EU Monitoring, Reporting and Verification (MRV) data). This represents around 11% of all EU transport CO₂ emissions and 3-4% of total EU CO₂ emissions. CO₂ emissions from international shipping in the EU are currently around 32% above 1990 levels (UNFCCC data). Emissions occurring when the ships were at

berth (anchored in port) amounted to around 6% of the total CO₂ emissions as reported under the MRV. In addition, significant emissions of sulphur oxides (SO_x), nitrogen oxides (NO_x), and particulate matter significantly contributed to air pollution in coastal areas and port cities, where ship engines are still being used to produce the necessary power during the port visit.

This increase is driven by the growth in transport activity not compensated by corresponding increase in energy efficiency, owing to slow implementation of emission reduction measures and persistent heavy reliance on hydrocarbon fuels. While further improvements in energy efficiency are necessary, this initiative focuses on accelerating the market uptake of sustainable alternative maritime fuels.

According to 2018 MRV data, the vast majority of the 44 million tonnes of fuel consumed and reported under the scheme concerned conventional fuels such as heavy fuel oil, gas oil, diesel oil, etc. Despite the existing framework for supporting their deployment, other fuels were only a small fraction of the fuels consumed by the monitored fleet. For instance, the use of Liquefied Natural Gas (LNG) was only 3% of the total amount of fuel consumed (mostly by LNG and gas carriers) and other alternatives, in particular renewable fuels, were negligible.

Several barriers, including market and regulatory failures, hinder the uptake of sustainable alternative fuels in maritime transport:

1. Lack of predicatibility and high risk of investment choices: The long life-cycle of ships of 25-30 years results in long lead times and a high risk of stranded assets. Accordingly, in the absence of clear-cut technological choices (see next point below) and of a defined regulatory path setting clear provisions for the decarbonisation of the future fuel mix, it is difficult for operators to build a business case and make long-term investment decisions. A wait-and-see approach is likely to prevail and defer deployment of new technologies and hence sustainable alternative fuels. While some alternative options are already mature enough for use in the shipping sector, the demand for these fuels has not proven to be sufficient to drive their production in sufficient and stable quantities.
2. Technological aspects and price factors: The number of sustainable alternative fuels and technologies currently available in the maritime sector is limited. This is due to the need to secure sufficient energy density (amount of energy stored in a given space per unit volume), especially for long, intercontinental voyages with no opportunity to refuel along the way. Lower density also implies sacrificing revenue-generating cargo space. Presently, liquid biofuels and electrically synthesised hydrocarbons have the highest energy density followed by natural gas and bio-gas, as well as other synthetic fuels (e.g. electricity-based e-gas). These fuels are compatible with the existing assets and infrastructure (liquid or gaseous) and can therefore be deployed immediately in existing oil- or LNG-fuelled vessels. However, the GHG reduction potential depends on whether they can be produced and used sustainably. Whilst LNG substantially contributes to pollution reduction, any contribution towards GHG reduction is limited, particularly taking into account methane slip. On shorter distances and in ports, lower energy density is sufficient, already opening additional decarbonisation and zero-pollution pathways (e.g. hydrogen and electrification). A positive sign is that new vessels are increasingly being constructed using engines with a multi-fuel capability, which can be adapted as new sustainable alternative fuels emerge. However, the fragmentation of the sector and the high level of customisation of vessels represent a barrier to reach critical mass for the deployment of new technologies, unless a large number of operators decides to take action. The lack of sufficient production levels contribute to the higher cost of sustainable alternative fuels compared to conventional fossil fuels, which remains a barrier to their uptake. Market-based-instruments, such as ETS, may help bridging the gap, but the price difference is likely to remain high until the production of sustainable fuels and technologies achieves sufficient economies of scale.
3. Interdependency issue: The EU has set up a regulatory framework on the deployment of alternative fuels infrastructure for transport, including provisions for equipment of ports on the Trans-European Transport Network (TEN-T) through the Directive on the deployment of alternative fuels infrastructure ([Directive 2014/94/EU](#)). Yet its scope is limited to the supply of LNG and on-shore power supply (non-mandatory) and does not contain provisions related to their use in operations. The very low demand from ship operators to bunker alternative fuels or connect to the electric grid while at berth makes it less attractive for ports to invest in alternative fuels infrastructure. For instance, data compiled by the European Alternative Fuels Observatory (EAFO) show that the deployment of onshore power-supply (OPS) has been slower than initially expected – OPS was only available in 19 TEN-T Core and 11 TEN-T Comprehensive Ports (over a total number of 83 Core and 236 Comprehensive Ports). Regulating alternative fuels infrastructure and the supply may not be sufficient to break the “chicken-and-egg” issue. Therefore, this initiative will assess options to address also the demand side. An additional interdependency stems from the national implementation of the recast Renewable Energy Directive ([Directive \(EU\) 2018/2001](#)), supporting the use of sustainable alternative fuels through the obligation set out therein, is being implemented by the Member States (the deadline for transposition into national legislation is 30 June 2021). Accordingly, the impact of the Directive on the use of sustainable alternative fuels in maritime remains uncertain given that Member States are left with a considerable degree of flexibility when implementing this policy.

4. Carbon leakage potential and split incentives: The sector is highly prone to carbon leakage since it would be possible for many vessels active in both deep sea and short sea trades to bunker fuel outside the EU. In addition, many ship-owners do not operate directly their vessels, but lease them to other parties, which creates 'split-incentives' with respect to investment in vessels' clean technologies. Both these factors represent additional obstacles to the uptake of more costly fuels and technologies and contribute to the lack of sufficient incentives for the decarbonisation of maritime transport operations.

Basis for EU intervention (legal basis and subsidiarity check)

Title VI of the Treaty on the functioning of the European Union (TFEU) confers to the European institutions the competence to lay down appropriate provisions in the transport sector. In particular, Article 100(2) stipulates, "*the European Parliament and the Council, acting in accordance with the ordinary legislative procedure, may lay down appropriate provisions for sea and air transport.*" In addition, Article 192(1) TFEU stipulates that the European Parliament and the Council, acting in accordance with the ordinary legislative procedure and after consulting the Economic and Social Committee and the Committee of the Regions, shall decide what action is to be taken by the Union in order to achieve its environmental objectives as referred to in Article 191 TFEU. Furthermore, Article 194(1) TFEU stipulates that the Union policy on energy shall aim, in a spirit of solidarity between Member States, to ensure the functioning of the energy market, ensure security of energy supply in the Union, promote energy efficiency and energy saving and the development of new and renewable forms of energy, and promote the interconnection of energy networks.

This initiative focuses on the demand for sustainable alternative fuels and, in doing so, complements existing instruments such as the Alternative Fuels Infrastructure Directive ([Directive 2014/94/EU](#)) and the recast Renewable Energy Directive ([Directive \(EU\) 2018/2001](#)). The implementation of this initiative at European level is necessary to achieve the economies of scale in accelerating the uptake of sustainable alternative fuels in maritime transport, avoiding carbon leakage, ensuring level playing field between operators calling in EU ports and between the EU ports themselves. The initiative will also provide greater certainty to the market operators on the possible pathways for reducing the GHG emissions from maritime transport thanks to the greater uptake of sustainable alternative fuels.

B. Objectives and Policy options

The initiative aims at reducing emissions from maritime transport by accelerating the uptake of sustainable alternative fuels and power in operation and at berth. Ensuring a much more diverse fuel mix and a higher penetration of sustainable alternative fuels is critical to bring maritime transport in line with the European ambition of climate-neutrality by 2050.

The initiative aims at increasing the share in the fuel mix of international maritime transport of sustainable low and zero-carbon alternative fuels including: liquid biofuels, e-liquids, decarbonised gas (including bio-LNG and e-gas), decarbonised hydrogen and decarbonised hydrogen-derived fuels (including methane, and ammonia). The initiative should take a well-to-wake approach, concerning emissions from production and use of these fuels, including methane slip. It also aims at enhancing the use of alternative fuels (including on-shore power) for ships at berth. While some of these fuels are already technologically mature, their deployment in the maritime sector and their use remains extremely limited and the existing uncertainty disincentives economic actors to invest in new technologies.

Given the contribution of shipping to air pollution in ports, the initiative should also look at options to reduce emissions at berth, in particular through the use of shore-side electricity. Both for use of electricity while at berth and for charging ship batteries, this should have a positive impact on uptake of electricity-powered ships.

When assessing the policy options, objectives will include to:

- **Enhance predictability, facilitate planning of investments and prevent a 'wait and see' attitude** by providing greater certainty to the sector and setting a clear pathway for decarbonising the current marine fuel mix;
- **Stimulate production on a larger scale and reduce the price gap** with current fuels and technologies, by boosting the uptake of technologically mature sustainable alternative fuels and technologies;
- **Boost demand from ship operators to bunker alternative fuels or connect to the electric grid while at berth and solve the interdependency issue**, complementing existing supply-side measures and facilitating rollout of infrastructure and investments in the production and deployment of sustainable alternative fuels in maritime transport;
- **Avoid carbon leakage**, by imposing obligations on all ships trading in the EU and calling EU ports, and eliminating any possible regulatory advantage derived by bunkering fuels outside the EU. Address at the same time the 'split incentives' issue through requirements on performance.

Subject to further analysis and scoping, the policy options could include:

- Baseline: No specific action addressing the demand for sustainable fuels for maritime transport.
- Support measures aiming at boosting market uptake of sustainable alternative fuels (e.g. facilitating

access to funding, differentiation of port fees, etc.)

- Prescriptive requirements on blending/definition of the share of sustainable alternative fuels and/or shore-side electricity to be used by ships in operation and at berth;
- Goal-based performance requirements on the carbon-intensity of energy used in marine operations and at berth, no prescribing the type of fuels to be used.

As regards the scope, the initiative is intended to be flag-neutral. The exact application, in terms of geographical scope, ship types and operation concerned (including, where possible, inland navigation), timing and phasing-in as well as the stringency of the requirements will be the subject of an impact assessment.

This initiative is meant to be part of a broader “basket of measures” to decarbonise maritime transport through a holistic approach. The Commission will assess options to extend European Trading System to the maritime sector and will look closely at the current tax exemptions including for marine fuels and at the use of shore-side electricity in the context of the revision of the Energy Taxation Directive. For all energy products supplied for use as fuel for the purposes of navigation within Community waters and for electricity produced on board a craft, the revision of the current mandatory tax exemption could allow for the use of more targeted tax incentives to promote the use of sustainable alternative fuels while an increasing scope for the reduction of the tax rate applicable to shore-side electricity (potentially going even to zero) could further incentivise the use of shore-side electricity. The focus on fuels and power technologies should enable significant and rapid emission reductions, using fully the existing technologies and infrastructure alongside incentives provided by other measures to be proposed. It will also facilitate the definition of decarbonisation pathways for the entire maritime cluster. The initiative will have interlinkages with the upcoming proposal for a revision of Directive 2014/94/EU on deployment of alternative fuels infrastructure that will examine needs and possibilities for strengthening provisions for the supply of sustainable alternative fuels infrastructure in ports.

Given work ongoing to decarbonise other transport modes and other sectors of the economy, this initiative will build on the impact assessment that the Commission plans to present by summer 2020 to increase of the EU’s GHG reduction target for 2030 to at least 50% and towards 55 % compared to 1990 levels. The initiative will also look at competition for sustainable alternative fuels/solutions across sectors and the availability-vs-cost of sustainable feedstock purchase and conversion into renewable fuels.

C. Preliminary Assessment of Expected Impacts

Likely economic impacts

While accelerating the uptake of sustainable alternative fuels in maritime transport will initially incur increased operating cost for ship owners and ship operators, it can also be expected to better prepare the sector to meet the upcoming climate and environmental challenges and thus enhance the competitiveness of the entire European maritime cluster (operators, ports, technology suppliers, fuel suppliers, etc.). The approach is expected to offer greater predictability on the pathways needed to achieve the emissions reduction objectives and hence also maximise the use of existing assets and infrastructure. A greater level of predictability on the future fuel mix is also necessary for the activities of various actors and operators in ports (ports authorities, terminal providers, etc.) and to facilitate investments. The effects on regional competitiveness, if any, vis-à-vis the rest of the world will be subject to further analysis in the impact assessment for the initiative. A flag-neutral approach will help reduce the risk of carbon leakage and ensure a level playing field between EU and third country operators.

The implementation costs will depend on the policy option retained and the extent to which these costs can be shared by the different economic actors, including ultimately the customers. On the one hand this initiative is likely to create additional costs e.g. the use of more expensive energy sources and, when necessary, the retrofitting of vessels, which might affect competitiveness and jobs. On the other hand, it is expected to significantly stimulate the market and bring European companies to the forefront of the transition, which the global maritime sector has committed in the IMO. In the past, the shipping industry has demonstrated its capability to internalise significant fluctuations in fuel prices. Ensuring increased demand for sustainable alternative fuels, it will indeed provide a framework to break the “chicken and egg” situation created by existing market barriers and the uncertainty on the maturity of various technical options. Without this policy intervention, the sizable investments in production and infrastructure that are necessary for the transition to sustainable alternative fuels would not be viable because demand will remain low.

Increased uptake of sustainable alternative fuels in maritime transport is also expected to boost research and innovation and deployment of innovation for vessels. It should therefore create a lead market in innovative and sustainable maritime fuel while it would be an opportunity to contribute to improve EU energy security and reduce its dependency on extra-EU energy sources.

Likely social impacts

Enhancing innovative technologies and solutions by this initiative is likely to boost employment in those parts of the maritime and ports sectors that deal with R&I as well as engine and equipment manufacturers. Ensuring flag-neutrality when preparing any new policy measures will minimize the effects of carbon leakage also in relation to

<p>employment on EU-flagged vessels.</p> <p>The enhanced deployment of sustainable alternative fuels will also require upskilling and reskilling of the work force, to be able to deal with new procedures (e.g. on connection of ships to the electrical grid while at berth) and to operate and maintain engines and machinery using sustainable alternative fuels. At the same time, it will require investment to provide affordable solutions to those affected by carbon pricing policies.</p> <p>The expected reduction in local air pollution in coastal areas and port cities is likely to bring significant health benefits to EU citizens. Further development of sustainable alternative energy hubs in ports is also likely to allow easier access to alternative sources of energy to other users than maritime transport only (“spill over” effects).</p> <p>Potentially higher costs of fuel might impact communities in remote islands that depend on maritime infrastructure for transport of passengers and goods.</p>
<p>Likely environmental impacts</p> <p>A shift to sustainable alternative fuels in maritime transport is critical to achieve a number of positive environmental effects:</p> <ul style="list-style-type: none"> • Reduction of GHG emissions; • Reduction of local air pollution, especially in SO_x, NO_x and particulate matter; • Reduction of noise emissions as a result to greater use of alternatives instead of diesel generators for ships at berth. <p>The scope options will be carefully assessed also against the criteria of carbon leakage, especially with regards to the geographical application.</p>
<p>Likely impacts on fundamental rights</p> <p>n/a</p>
<p>Likely impacts on simplification and/or administrative burden</p> <p>The possible impact on administrative burden will depend on the policy option retained. It is however expected to minimise additional burden by using as much as possible existing EU frameworks for reporting, monitoring and verification of emissions as well as enforcement. It will be essential to ensure coherence with the existing legislation such as the sustainability requirements, definitions and methodologies set out for renewable fuels in the recast Renewable Energy Directive (EU) 2018/ 2001. Coherence with the EU Emissions Trading Scheme, revision of the Energy Taxation Directive and revision of the Alternative Fuels Infrastructure Directive must also be ensured.</p>
<p>D. Evidence Base, Data collection and Better Regulation Instruments</p>
<p>Impact assessment</p> <p>An impact assessment will underpin any proposal made in the context of this initiative. The work on a supporting analytical study will start in Q2 2020.</p> <p>In line with Better Regulation instrument, the Innovation Principle will be applied, to keep the initiative open for new, innovative solutions.</p>
<p>Evidence base and data collection</p> <p>Some relevant data has already been collected and analysed with respect to the provision of the infrastructure of alternative fuels in Europe, notably through the analysis of the National Policy Frameworks submitted by the Members States and the work already carried out by the European Alternative Fuels Observatory, which was established by the European Commission.</p> <p>In addition, data collected under the Monitoring Reporting and Verification Regulation provide a rather detailed picture of the emissions occurred by ships involved in European seagoing traffic (to, from or in between and within ports in the European Economic Area). As the calculation of emissions under the MRV systems relies on fuel consumption (which is converted in quantities of emissions by applying an appropriate emission factor), there is already a solid overview of the different types of fuels consumed by ships in Europe, including, when relevant alternative fuels.</p> <p>In addition to the discussions organised on alternative fuels infrastructure in the context of the Sustainable Transport Forum (STF), the European Commission has also established since 2013 the European Sustainable Shipping Forum (ESSF), which is a platform designed to engage and exchange views with Members States and the main maritime stakeholders on a wide range of environmental issues. In 2019, a sub-group dedicated to “Sustainable Alternative Power for Shipping” was created to focus on issues related to the sustainable alternative fuels for ships. In addition, a “Sustainable Ports” sub-group was created under the European Ports Forum.</p> <p>On these topics, the Commission is also cooperating very closely with the European Maritime Safety Agency</p>

(EMSA), which will provide technical assistance and expertise (e.g. technical safety assessments, consultation with experts and stakeholders, etc.)

European R&I can contribute with delivering evidence and data, for cost reduction of alternative fuels and technologies and for delivering improvements in conversion efficiency.

The impact assessment for this initiative will be supported by an external analytical study that will assist the Commission with the evidence base and data collection.

Consultation of citizens and stakeholders

Given the nature of this initiative, the Commission will conduct an open public consultation in all EU languages. It will also consult a targeted group of stakeholders in the context of the European Sustainable Shipping Forum (ESSF) and the European Ports Forum, where relevant representatives from industry, civil society, research, and Member States are present.

Consultations will aim at better identifying the current barriers to the use of sustainable alternative fuels in maritime transport, including those of market, regulatory or technical nature. The scope of the consultations will not be limited to fuels used for the propulsion of ships but also to power vessels while at berth and to perform cargo operations (loading and unloading) or hotelling (time spend at berth when the ship is neither loading nor unloading and is spending minimum power).

Results of the consultations will be summarised in a report that will be made available on the Commission's website.

Will an Implementation plan be established?

It is yet unclear as to which degree provisions will be included in the possible legal instrument would require an implementation plan. Should such a guidance be required for certain provisions, the Commission will envisage to adopt an implementation plan.