

INSIGHT BRIEF

How the EU can catalyze the global transition to zero-emission shipping and the green hydrogen economy

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1. Introduction

Support for the transition to zero-emission shipping¹ is growing as evidenced by both public and private commitments to zero-emission shipping by 2050 including from all EU-27 member states at the latest International Maritime Organization (IMO) Marine Environment Protection Committee (MEPC) meeting in November 2021. However, to achieve this ambition, enabling policy frameworks are urgently needed, including investment in scalable zero-emission fuels² (SZEFS), vessels, and infrastructure.

The EU Commission has proposed a range of policy and regulatory measures as part of the 'Fit for 55' package, which has the potential to unlock zero-emission shipping investment in Europe. This will further catalyze global climate action and the transition to the green hydrogen economy, however, 'Fit for 55' includes design flaws that if not amended will work against full shipping decarbonization by 2050 and the objectives of the EU Hydrogen Strategy.

This Insight Brief outlines the design flaws of 'Fit for 55' in relation to shipping decarbonization and highlights points for improvement.

2. The route to full shipping decarbonization begins with EU action

The EU already supports full decarbonization of international shipping by 2050 in the IMO, but this is not underpinned by 'Fit for 55'. To put action behind words, EU policy makers should make sure that 'Fit for 55' becomes a driver of shipping decarbonization.

There are five proposals within the 'Fit for 55' package that will impact shipping.³ The most significant of these are the proposal to include shipping in the EU ETS and the FuelEU Maritime proposal.

¹ Zero-emission shipping is defined as shipping powered by net zero energy sources, which accounts for 'well-to-tank' (full life cycle) greenhouse gas emissions. Further guidance can be found in the Getting to Zero Coalition's '[Definition of zero carbon energy sources](#)'.

² Scalable zero-emission fuels include hydrogen and hydrogen-derived fuels such as ammonia, e-methanol, and synthetic hydrocarbon fuels. 'Fit for 55' applies the term Renewable Fuels of Non Biological Origin (RFNBOs).

³ European Parliament, Briefing: EU Legislation in Parliament, [Sustainable maritime fuels – 'Fit for 55' package: the FuelEU Maritime proposal](#), p. 3, 23 November 2021



The table below compares ‘Fit for 55’ against four critical steps that need to be taken this decade to reach the ambition of zero emission shipping by 2050 as identified by the Getting to Zero Coalition.⁴

Critical elements to achieve Zero-Emission Shipping	Fit for 55
A clear target of zero-emission shipping by 2050.	No clear target for full decarbonization.
An interim target of at least five per cent of international shipping fuels are scalable zero-emission fuels (SZEFS) by 2030 including incentives for production and uptake of SZEFS.	Interim targets in FuelEU Maritime to reduce the average GHG intensity of marine fuels by two per cent from 2025 and six per cent from 2030 compared to 2020. However, no interim target or incentives for SZEFS by 2030. ⁵
Investments in zero-emission fuels, vessels, and infrastructure to de-risk first movers while reducing costs through scale and technology learnings.	No guarantee that shipping generated revenues from the EU ETS will be used in the maritime and energy industries to accelerate shipping decarbonization.
Global regulatory framework supplemented by national and regional action for domestic shipping.	FuelEU Maritime and EU ETS contain review clauses. The Commission would monitor and report on potential IMO regulation and propose amendments to the EU regulation, if necessary.

For the EU to lead on shipping decarbonization, EU policy makers should focus on setting a clear target for full decarbonization by 2050 and an interim target of five per cent SZEFS by 2030 and make sure to use some of the revenue raised from shipping’s inclusion in the EU ETS to drive the transition. This will send a clear signal to all the stakeholders needed to decarbonize the maritime ecosystem including shipping companies, energy companies, technology providers, cargo owners, investors and ports which will help unlock massive investments and growth opportunities in Europe and globally.⁶

3. Ensuring at least five per cent scalable zero-emission fuels by 2030

The full decarbonization of shipping in 2050 will require that global and domestic fleets run entirely on shipping fuels from net zero-carbon energy sources, which include fuels derived from renewable electricity, biomass and the use of carbon capture and sequestration (e.g., green and blue hydrogen and their derivatives, as well as sustainable biofuels). Hydrogen-derived fuels have the biggest long-

⁴ See also ‘[Call to Action for Shipping Decarbonization](#)’.

⁵ Given that the EU is likely to be a global leader in zero-emission shipping, the EU must aim to have more than five per cent zero-emission shipping by 2030 if the five per cent target is to be met on a global level.

⁶ Global Maritime Forum, “[The scale of investment needed to decarbonize international shipping](#)”, 20 January 2020



term potential for scale, so should therefore be a priority within the future fuel mix.⁷ Fossil LNG is not a net-zero emission fuel and biofuels are unlikely to be scalable to supply the global fleet when also considering land use issues and competing demand. Consequently, to be able to decarbonize international shipping by 2050, SZEFS must be competitive by 2030 and the main fuels by the 2040s.

The target of five per cent by 2030 is based on the findings of the Getting to Zero Coalition’s transition strategy⁸ which shows that the adoption of zero-emission fuels is likely to follow a transition pathway of three distinct phases known from other technology and energy transitions. These phases together show an S-curve of the zero-emission fuel adoption rate, see figure 1 below:

1. Emergence Phase: Characterized by rapid learning and cost reductions
2. Diffusion Phase: Sees rapid adoption of new technology, with positive feedback loops raising confidence, demand, and investment across the value chain
3. Reconfiguration Phase: Establishes the new technology as normal and sees a flattening of the curve

7 Global Maritime Forum, “Five per cent zero-emission fuels by 2030 needed for Paris-aligned shipping decarbonization”, 9 March 2021

8 Getting to Zero Coalition, *A Strategy for the Transition to Zero-Emission Shipping*, October 2021

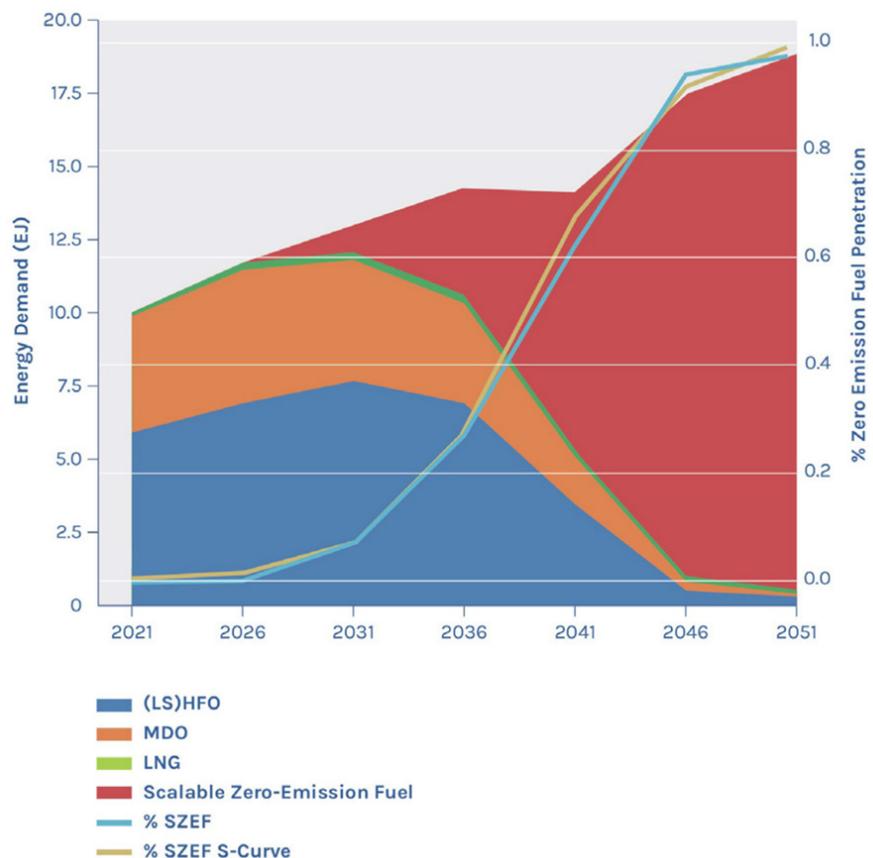


Exhibit 1: S-Curve transition pathway to full adoption of scalable zero-emission fuels (SZEFS)

Source: Getting to Zero Coalition, *A Strategy for the Transition to Zero-Emission Shipping*, p. 29 (October 2021)

To be able to decarbonize shipping by 2050 in a manner where companies, the EU, and member states are able to properly plan and implement individual actions, also considering a ship's lifespan of 20+ years, the EU should focus on setting the emergence phase in motion now. The interim target this decade should be to move from zero to five per cent SZEFS. Reaching this target will drive down costs and help make the ensuing rapid scale-up and uptake of SZEFS commercially viable by 2030.

4. Ensuring investments in SZEFS to drive down costs this decade

The main challenge to the use of SZEFS in shipping is the significant price gap between fossil fuels and SZEFS, which can only be closed by regulation. This can be achieved in a variety of ways, e.g. through fuel standards and putting a price on carbon, as suggested in a recent report from the Getting to Zero Coalition.⁹

The first policy option is a fuel standard that sets an interim sub-target of five per cent SZEFS by 2030. Currently, FuelEU Maritime only includes a fuel standard with low reduction in GHG intensity from 2025 and no real incentives to use and produce SZEFS, which will not drive the shift to SZEFS in the short term. On the contrary, analysis undertaken by CE Delft shows that the FuelEU Maritime proposal will encourage a shift towards fossil LNG (and biofuels), which may lead to multi-decade asset lock-in of LNG vessels and infrastructure, which would delay shipping decarbonization.

In the debate on FuelEU Maritime, a number of suggestions have been made by industry and NGOs to revise the proposal to incentivize the use and production of SZEFS. This could for instance be a sub-target mandating that a certain proportion of the fuels used to comply with FuelEU Maritime must be SZEFS while also taking measures to ensure the necessary supply of SZEFS. It could also be to allow SZEFS to count x times more relative to fossil fuels when reporting on fuel use, i.e. use so-called multipliers. As an example, the NGO, Transport & Environment has proposed an e-fuels sub-target of six per cent of the energy demand used by ships by 2030 and a multiplier of five for sustainable e-fuels, especially green hydrogen and ammonia.¹⁰

The second policy option is to eliminate the price gap between fossil fuels and SZEFS by putting a sufficiently high price on GHG emissions. Calculations for the Getting to Zero Coalition show that to close the fuel price gap and incentivize production and uptake of SZEFS, an average carbon price of \$191/tonne CO₂ is needed, beginning in 2025 until 2050.¹¹ The EU ETS however is significantly

⁹ Closing the Gap: An Overview of the Policy Options to Close the Competitiveness Gap and Enable an Equitable Zero-Emission Fuel Transition in Shipping, January 2022

¹⁰ Transport & Environment, FuelEU Maritime: T&E recommendations for driving the uptake of sustainable and scalable marine fuels, February 2022

¹¹ The Getting to Zero Coalition, Closing the Gap: An Overview of the Policy Options to Close the Competitiveness Gap and Enable an Equitable Zero-Emission Fuel Transition in Shipping, p. 33, January 2022

lower than this level as the EU Commission assumes an average ETS carbon price of €45/tonne CO₂ in 2021-2025 and €55/tonne CO₂ in 2026-2030.

This means that the ETS in itself will not be enough to drive the uptake of SZEFS, although it will raise significant revenue from shipping emissions in the order of €5 billion annually.¹² These funds would be more than enough to support the use of at least five per cent SZEFS in shipping activities under 'Fit for 55' in 2030. Investing ETS revenue in SZEFS, zero-emission vessels and land infrastructure would mean that the decarbonization of shipping could be fully funded by the maritime industry and its customers.

A promising way of subsidizing the use of SZEFS in shipping could be through Contracts for Difference (CfDs),¹³ which has already been used by EU member states to support the roll out of renewable energy such as wind and solar in a cost-competitive manner and which has already been identified by the European Commission as a potential tool to support the use of alternative transport fuels.

¹² See also Parker, S., Shaw, A., Rojon, I., Smith, T. **Harnessing the EU ETS to reduce international shipping emissions: assessing the effectiveness of the proposed policy inclusion of shipping in the EU ETS to reduce international shipping emissions**, p. 31. Environmental Defense Fund Europe, London, December 2021.

¹³ European Commission, **Updating the 2020 New Industrial Strategy: Building a stronger Single Market for Europe's recovery**, COM(2021) 350 final, p. 18, Brussels, 5 May 2021.

Contracts for Difference¹⁴

Researchers from University of Oxford have proposed how CfDs can support shipping decarbonization. The main purpose of a CfD, like any subsidy mechanism, is to create incentives to close the cost gap between an old technology and a new one.

A CfD mitigates the market risks faced by suppliers of a new, high-cost commodity by paying the supplier the difference between a predetermined reference price reflecting the old technology (in this case, the cost of MGO shipping fuel) and a 'strike price' set at the value required for the new technology to be viable.

The strike price can be determined either administratively or through a competitive auction in which bidders submit prices and the lowest bid(s) is awarded the contract, subject to meeting specified conditions. When the reference price is lower than the strike price, the supplier is paid the difference. This ensures that the supplier receives a guaranteed minimum price for the duration of the CfD. In most CfD mechanisms, if the reference price exceeds the strike price, the supplier repays the subsidy. (Clark, et al, 2021, p. 39).

¹⁴ Clark, et. al, **How Contracts for Difference can incentivise the decarbonisation of international shipping**, University of Oxford, Smith School for Enterprise and the Environment, June 2021



5. Global implications of 'Fit for 55'

Currently 18 per cent of the global maritime emissions are caused by ships calling at EEA ports, which means that while EU action can catalyze the global transition to zero-emission shipping, its completion can only be achieved through the adoption of globally encompassing regulation ideally adopted through the IMO.

It is thus positive that the EU ETS and FuelEU Maritime proposals include review clauses in relation to potential IMO regulation. It is also important that the EU and its member states continue to push for ambitious global solutions at the IMO, especially as work on revising the Initial IMO GHG Strategy and related measures gets underway.

The EU could also use shipping related ETS revenues to catalyze investments in the production of zero-emission fuels outside of Europe, for instance in Africa. Such a policy would promote a just and equitable transition for the shipping sector, while also supporting the objectives of the Africa-EU Partnership and diversify the EU energy supply and thereby increase EU energy security.

To sum up, the European Union has a unique opportunity to catalyze the decarbonization of international shipping. To fully seize this opportunity, European policy makers should ensure that the 'Fit for 55' package is adjusted to stimulate the production and uptake of scalable zero-emission fuels by using revenue raised from the inclusion of shipping in the ETS. If this is done, the European Union can truly lead the way towards zero-emission shipping and position itself and its companies as the leaders of the hydrogen economy of the future.