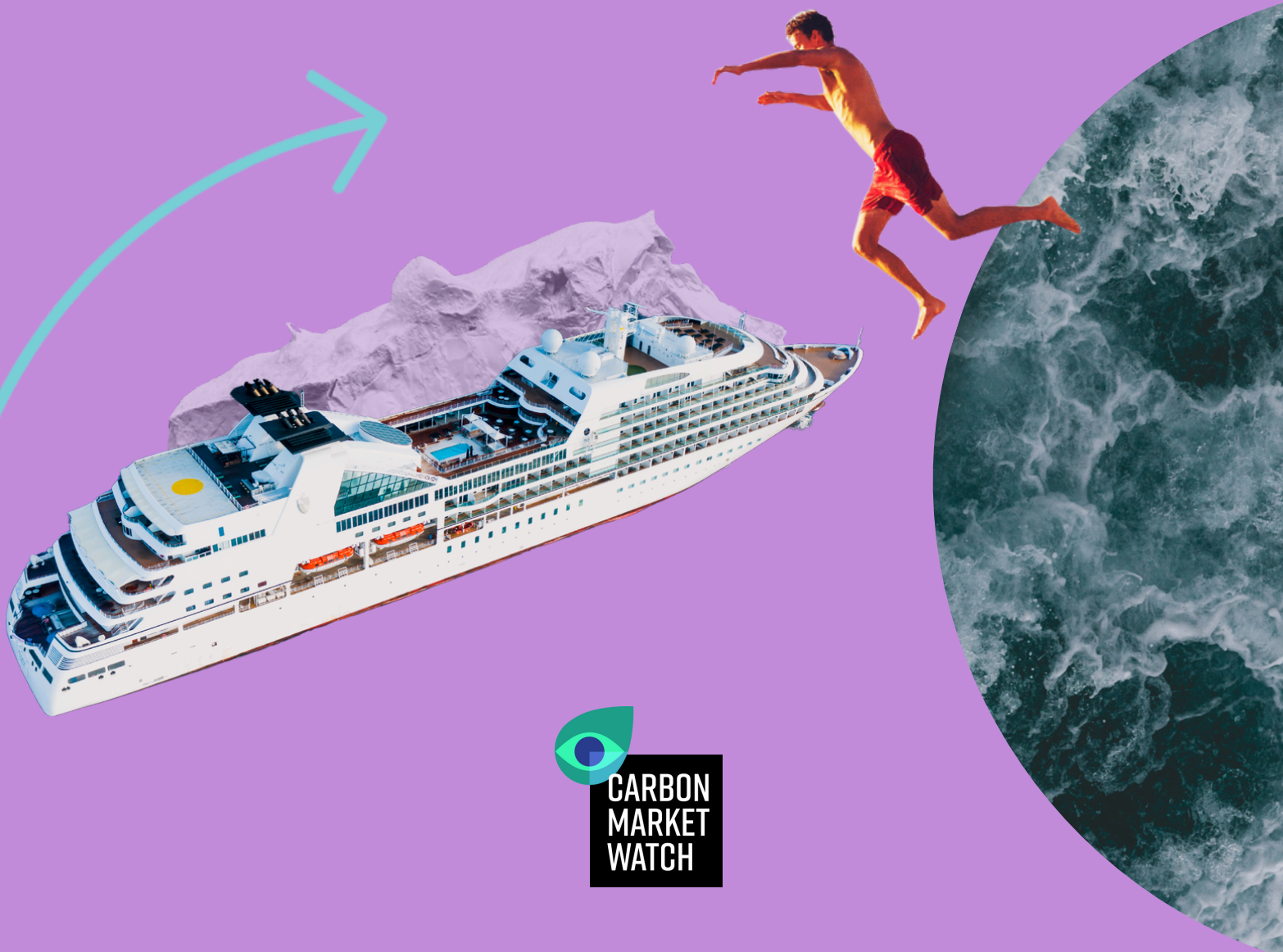


LOST AT SEA

How international shipping is drifting off course on climate action

Analysis of the International Maritime Organisation's stalled Net-Zero Framework

POLICY BRIEF
November 2025



Executive summary

The tide was supposed to turn on 17 October 2025. As the International Maritime Organisation (IMO) convened an extraordinary session, global attention focused on what would have been a starting point for decarbonising global shipping: the adoption of the Net-Zero Framework (NZF). Instead, under pressure from oil-producing countries and direct threats from the [Trump administration](#) in the United States, a narrow majority of member states voted to delay the decision by a full year.

While the adoption would have been a crucial step for multilateralism, our [study](#) by Cincera Consulting, led by Professor Michele Cincera from the Université Libre de Bruxelles (ULB), highlights that the IMO NZF does not reduce enough emissions, leaves most emissions unpriced, sets the carbon price too low, and generates inadequate revenue to support a just transition.

The scheme is not enough to effectively address the climate crisis, slashing shipping emissions by a projected maximum of 10% by 2030, compared with the 43% required by the Paris Agreement, our study reveals (see table).

Civil society organisations [warned](#) of this risk right after the compromise was proposed in April. To make matters worse, the postponement will add another year to the clock at a time when humanity cannot afford any further delays. In this policy briefing, we present the study's main findings and share our policy recommendations:

¹ From 2008 levels.

² The [IPCC Special Report \(SR15\)](#) (2018) finds that to stay below or near 1.5 °C warming, global CO₂eq emissions need to fall by about 45% by 2030 from 2010 levels.

³ August 2025.

⁴ The shipping ETS will generate around €10 billion/year in Europe when it is fully phased in. (T&E (July 2025). [Towards 2040: a strengthened ETS to support the transition of the shipping sector.](#))



- IMO member states must adopt the NZF next year, and in the meantime, ensure the development of ambitious NZF guidelines - especially regarding lifecycle emissions assessment, the zero or near-zero fuel (ZNF) reward scheme, and revenue redistribution to the energy transition of small island developing states and least-developed countries.
- Individual countries and blocs must strengthen regional measures, which currently remain the only regulations addressing shipping emissions. For instance, the geographical scope of the EU Emissions Trading System should be extended to cover 100% of emissions from voyages leaving or entering the European Economic Area.
- Countries should commit revenue to supporting the production of clean zero-emission fuels and technologies in the most vulnerable countries, helping to build trust in a just and equitable transition under the IMO NZF in the lead-up to the final vote.
- Countries and blocs committed to climate action should push the IMO to pursue higher ambition in the longer term, in terms of higher emissions reduction trajectories, a larger share of emissions being priced, higher carbon prices, and penalties for non-compliance under the IMO NZF.

Figure 1. Comparison of emissions reductions, pricing, and revenue potential.

	IMO NZF	IMO Strategy	Paris Agreement
Emission reductions (by 2030)	8-10% ¹	20-30% ¹	45% ²

	IMO NZF	EU ETS for shipping
Amount of priced emissions	14%	100%
Price/tCO ₂ eq	\$14	\$83 ³
Revenue/year	\$15bn (globally)	\$10bn (EU) ⁴

Source: Michele Cincera et al, From Compromise to Consequence: Evaluating the IMO's Net-Zero Framework and its Implications for the EU, Carbon Market Watch, 2025

The IMO Net-Zero Framework (NZF): Stranded on the shores of inaction

The shipping sector accounts for 3% of global greenhouse gas (GHG) emissions. At current growth rates, this share could soar to 10% by 2050, according to the environmental research organisation T&E.

Although the International Maritime Organisation (IMO) updated its climate strategy in 2023, the new targets remain far below what is needed to align with the Paris Agreement's 1.5°C goal. Achieving this goal would require a 45% reduction in emissions by 2030, versus 20-30% in the IMO Strategy.

At its 83rd session in April 2025, the IMO's Marine Environment Protection Committee (MEPC) was meant to agree on mid-term measures to steer international shipping towards full decarbonisation, in line with the organisation's updated GHG Strategy.

These mid-term measures were to include both technical and economic elements. The technical element would be a GHG fuel standard requiring reductions in the GHG Fuel Intensity (GFI) of marine fuels, while the economic element would be a pricing scheme for greenhouse gas emissions.

The aim was to amend Annex VI of the International Convention on the Prevention of Pollution from Ships (MARPOL) - a treaty ratified by over 100 countries - to make these measures legally binding.

Instead of choosing an effective carbon levy, the IMO settled on a weak compromise: a hybrid approach combining a GHG fuel standard with a limited carbon pricing component. This compromise not only goes against the IMO's own GHG emissions reduction targets, it will push them even further beyond the abatement levels required by the Paris Agreement objectives. Weak carbon pricing levels don't make up for this inadequacy and won't raise enough revenue for a just and clean transition.

The final vote on the adoption of the compromise was scheduled for 17 October at an extraordinary meeting. Adoption received broad support from most of the EU member states, the UK, Pacific Island states, Brazil, Canada, Australia, and others, as well as from the shipping industry and civil society. However, the vote was postponed by one year following threats from the United States and pressure from other oil-producing countries, which resulted in a narrow majority in favour of delay.

To ensure the framework delivers emissions reductions, IMO member states must adopt it when it comes up for a vote next year, strengthen its design, and resist any further attempts to weaken its provisions.

Our study outlines the main problems with NZF: low climate impact, a weak carbon price signal, limited and unpredictable revenue, insufficient support for zero-emission fuels, distributional and equity concerns, and implementation risks.

Climate targets at risk of drowning

The IMO NZF scheme is based on a greenhouse gas (GHG) fuel standard for international shipping emissions. It is a command-and-control type of policy that operates through standards and penalties, comparable in its functioning to the [EU's FuelEU Regulation](#). Each year, it sets emissions targets through pre-determined GHG intensity reduction factors (also known as 'Z factors'). As these emission reduction percentages become more ambitious over time, ships and fleets must use cleaner fuels or operate more efficiently to lower their GHG fuel intensity (GFI), that is the amount of GHG emitted per unit of energy used (measured in grams of carbon dioxide equivalent per megajoule or gCO₂eq/MJ).

Z factors are currently defined for each year from 2028, when the scheme is set to begin, to 2035 only. Two levels of ambition are provided: a less demanding 'base target' trajectory and a more ambitious 'direct compliance' curve. A base target level is also indicated for 2040. However, the IMO NZF does not refer to the following 10 years to 2050 - the year 'by or around' which international shipping must reach carbon neutrality under the [IMO's GHG Strategy](#).

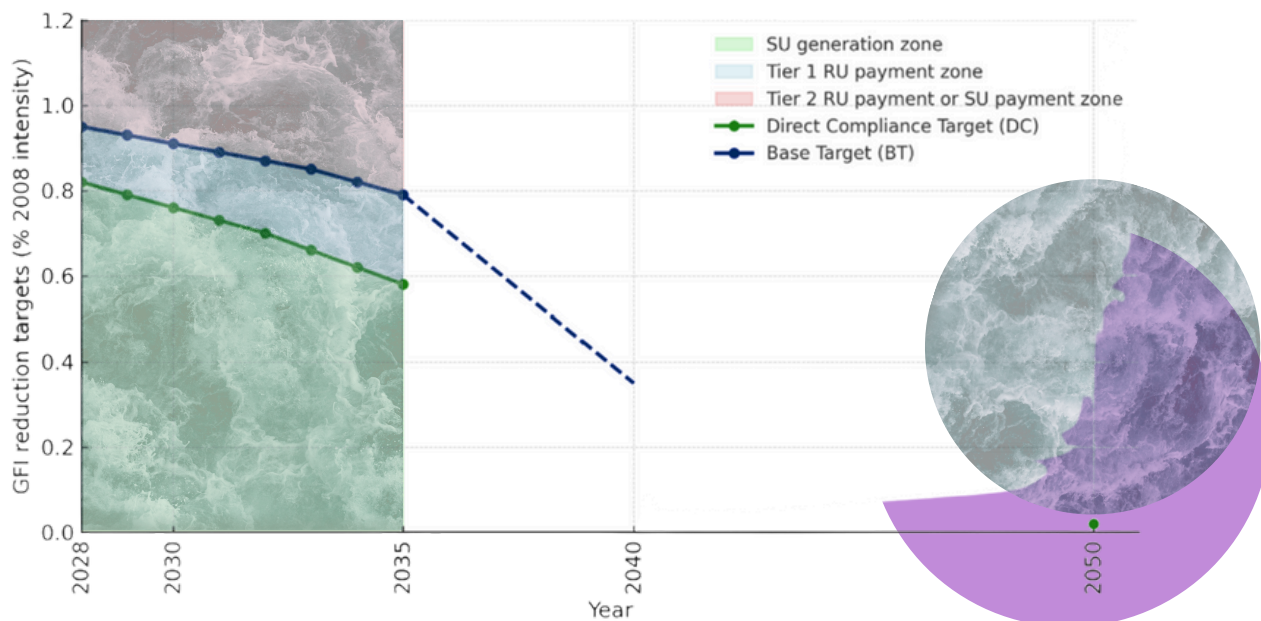
Figure 1 outlines these trajectories and milestones. It also highlights the various compliance and non-compliance zones that fleets may fall into, depending on the amount of GHG emitted per unit of energy used.

The green zone is a first compliance zone (direct compliance), where ships meet the most ambitious decarbonisation targets. Ships in this category have significantly reduced their GHG emissions per unit of energy used, either by using cleaner fuels, operating more efficiently, or both. As a reward, they earn surplus units, meaning emissions units they have not used due to outperforming the direct compliance target. These surplus units can be sold to non-compliant (tier 2) ships in the red zone, providing additional revenue for the most ambitious fleets.

If ships fail to meet direct compliance but do meet the base target, they land in the blue zone (tier 1). Although these ships meet the minimum standard, they are still required to purchase tier 1 remedial units, which carry a carbon price of \$100 per tonne of CO₂ equivalent.

Finally, if a fleet does not even comply with the less ambitious base target, it is in the non-compliance red zone (tier 2). These ships must either buy surplus units from overcomplying ships or pay for more expensive tier 2 remedial units, which are priced higher at \$380/tCO₂eq. However, as discussed in the 'Carbon pricing' section below, the actual prices of these remedial and surplus units are far lower in practice.

Figure 2⁵. The IMO Net-Zero Framework trajectories and milestones.



Source: Michele Cincera et al, From Compromise to Consequence: Evaluating the IMO's Net-Zero Framework and its Implications for the EU, Carbon Market Watch, 2025

In addition, it is important to highlight that the NZF does not aim to reduce the level of absolute emissions - unlike a universal levy or the EU ETS - but targets the GHG intensity levels of the energy used. Moreover, it does not consider activity growth and the associated emissions. This means that emissions would actually rise if the growth of the shipping sector outstrips the gains from improved GHG intensity.

Figure 3 below, showing total absolute GHG emissions and assuming a realistic 3% yearly growth rate in shipping activity, clearly shows that the efficiency gains from the NZF's Z factors alone are insufficient to reach the IMO GHG Strategy's targets, let alone comply with the Paris Agreement goal of limiting global temperature rises to 1.5°C.

This 2023 strategy had set a base target of slashing emissions by at least 20% and striving for 30% by 2030, compared with a 2008 baseline. This would rise to a minimum of 70%, and striving for 80% by 2040.

According to our analysis, even if the IMO NZF had been launched as planned, the hybrid mechanism would have resulted in 13-32% (80-175 million tCO₂eq) higher annual emissions compared to meeting the IMO's 2030 target. This would put the IMO completely off course to achieving its own GHG Strategy targets, and even further away from meeting Paris Agreement objectives.

⁶ The most recent IMO GHG Study estimates that 2008 international shipping GHG emissions were 794 million tCO₂eq. Under the IMO GHG Strategy, emissions are expected to be reduced by 20-30%, resulting in 556-635 million tCO₂eq per year. In contrast, the NZF pathway achieves only an 8-10% reduction, corresponding to 715-731 million tCO₂eq per year.

Figure 3. Projected evolution of total GHG emissions from international shipping (indexed to 2008 = 100) – assuming 3% annual growth.



Source: Michele Cincera et al., *From Compromise to Consequence: Evaluating the IMO's Net-Zero Framework and its Implications for the EU*, Carbon Market Watch, 2025

Given the very real risk that emissions will rise before falling inadequately, we recommend that the IMO should at the very least significantly accelerate GHG intensity emissions reduction mandated by the Z factors by increasing the level of the latter in a way that would enable the IMO to reach its own 2030 and 2040 targets. This acceleration should increase proportionately to any delays that may occur in the implementation of the NZF.

The IMO should urgently roll out workable solutions to its failure to tackle absolute emissions, such as an effective universal levy on all shipping traffic. Another, less likely option, is an international cap-and-trade system for shipping.

Carbon pricing: anchored ambitions

Due to the hybrid nature of the NZF scheme, carbon pricing is only one of several dimensions of the mechanism. On top of this, fleets not meeting the direct compliance and/or base target must purchase remedial units, as explained earlier. While the tier 2 remedial unit price is set at \$380/tCO₂eq, the surplus unit price will depend on future market forces, which, a recent [analysis](#) indicates, may settle at around \$300.

The hybrid element of the scheme rests on the requirement for fleets to pay for a carbon price even if they meet the base target but fail to meet the more ambitious direct compliance target. In this case, fleets must purchase cheaper tier 1 remedial units, costing \$100/tCO₂eq. This is the carbon pricing component of the IMO NZF.

Nonetheless, payments of tier 1 RUs, just like tier 2 RUs or SUs, function very differently to a flat tax, a universal levy or the EU ETS for the maritime sector: [Carbon Market Watch](#) and [T&E](#) estimate that this design will result in less than 15% of total emissions being priced under tier 1 RUs through 2035. This would result in a low effective carbon price of only about \$14/tCO₂eq if the RU price were to be spread across a fleet's entire emissions.

This would make the NZF carbon price signal around six times lower than the EU ETS price in August 2025 (\$83), up to 38 times lower than the social cost of emissions⁷, and 31-39 times lower than the price needed for green marine fuels, such as e-ammonia⁸ or e-methanol⁹, to compete with incumbent polluting fuels like very low-sulphur heavy fuel oil (VLSHFO).

While a carbon price of \$14/tCO₂eq is better than the free pass international shipping has benefited from until now, this is far from enough. It will not compensate for the insufficient emissions reductions rooted in the weak Z factors, as explained in the section above. This will severely slow down the decarbonisation of the shipping sector because it will not make business as usual costly enough to instigate change. It will also not raise enough revenue for the clean and just transition of shipping.

To tackle these shortcomings, we recommend that the IMO revise upwards the price levels of tier 1 and 2 remedial units in their planned review after 2028 so that ship operations effectively pay a carbon price of \$100/tCO₂eq for every tonne they emit starting in 2031. The IMO should also consider increasing Z factors for direct compliance significantly faster in order to widen the tier 1 zone and broaden the share of priced emissions, indirectly raising the effective carbon price on ships.

⁷ Recent research places the social cost of carbon in the range of \$185–538/tCO₂eq.

⁸ ClimateWorks Foundation (2024) estimates a cost gap for green ammonia of \$1,400–1,650 per tonne of HFO replaced; assuming 3.2 tCO₂eq per tonne of HFO, this implies a break-even carbon price of about \$436–515 per tCO₂eq.

⁹ Irena and Methanol Institute (2021) reports current commercial-scale e-methanol production costs at \$800–1,600/t assuming CO₂ is sourced from bioenergy with carbon capture and storage and at \$1,200–2,400/t if CO₂ is obtained by direct air capture. With VLSFO at ~USD 500/t, it gives a cost gap of \$300–1,100/t for one type and \$700–1,900/t. Using an emission factor of approximately 3.21 tCO₂eq/t fuel, this corresponds to a break-even carbon price of up to \$550/tCO₂eq.

Revenue: a drop in the ocean

In carbon pricing schemes, the generation of revenue is a major co-benefit alongside emissions reductions. The money raised can be partly used to support the sector in the research, construction and uptake of clean technologies, such as wind propulsion and green synthetic fuels, and partly to make up for some of the policy's potential social costs, such as price rises for the most vulnerable citizens, regions or nations, not to mention to compensate for some of the environmental cost of emissions under the 'polluter pays' principle.

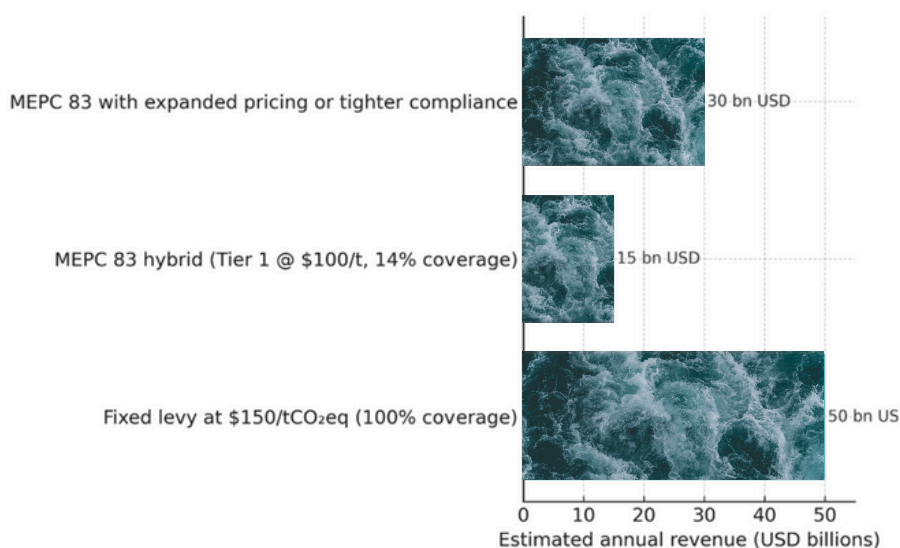
The EU ETS generated about €40 billion of revenue in 2024, of which €2 billion were from shipping companies operating routes covered by the scheme in 2024. With the full phasing in of the shipping sector, revenue from shipping alone is expected to reach around €10 billion a year.

The IMO NZF will generate revenue from the sale of tier 1 and 2 remedial units. These payments will flow to a newly set up IMO Net-Zero Fund.

Yet, considering the weaknesses highlighted in the sections above, particularly in terms of the low effective carbon price, revenue flows are consequently expected to be limited: our study projects they will be at around \$15 billion per year. In comparison, the EU ETS could raise approximately around \$10 billion annually from the maritime sector alone, despite covering only voyages linked to the EU. This highlights the limited impact of the IMO NZF: it would apply to the entire global shipping sector, yet it would deliver relatively little revenue to drive the transition to cleaner technologies and fuels.

Worse still, this is only about a third quarter of the estimated \$560 billion what a high fixed levy of, say, \$150/tCO₂eq, would have generated annually. This figure reflects the minimum level of funding required to safely pilot international shipping towards a sustainable, just, and equitable future.

Support for a 'just and equitable transition' is a cornerstone of the 2023 IMO's GHG Strategy. Besides the uptake of zero or near-zero (ZNZ) fuels and technologies, this should be a key component of where the revenue is channeled.



Sink or swim moment

Given the delay of the vote on the IMO Net-Zero Framework, it now falls on national governments and regional blocs to ensure their shipping industries propel the international maritime sector towards a cleaner climate horizon.

IMO member states should put in place or strengthen national or regional measures to price or control maritime emissions, such as by strengthening coverage in emissions trading systems that already cover shipping, like Korea, or incorporating them into emissions trading schemes that do not currently cover shipping, such as China.

Unfurling the sails of EU flagship

The European Union needs to increase the ambition of its climate measures to compensate for the delay at the IMO. This involves expanding the EU ETS for shipping to cover 100% of emissions of ships leaving or entering the EU from other parts of the world instead of the current 50%.

Moreover, the EU must resist demands made by the US-led coalition to decrease the ambition of the EU ETS for international shipping. The coalition was trying to convince the most vulnerable countries that the EU would not support them in the transition. The EU must prove the US wrong by committing ETS revenue to supporting the production of clean fuels and technologies in the most vulnerable countries so as to build trust that a just and equitable transition is achievable.

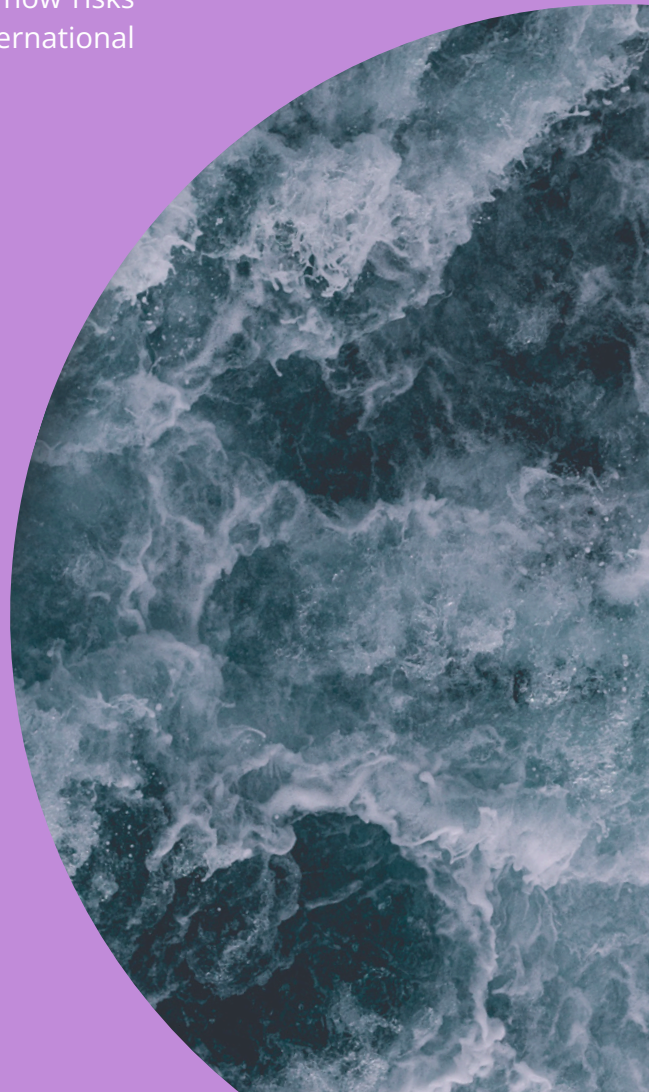


Conclusion & Recommendations

While the IMO Net-Zero Framework would have served as a starting point for global shipping decarbonisation, our study shows it falls short of what the climate crisis demands.

The scheme lacks ambition on emissions reductions, pricing coverage, carbon price levels, and revenue generation. The one-year delay in adoption only deepens the gap between global action and climate urgency.

The shift toward cleaner fuels and technologies is already underway. With the adoption of a global mechanism delayed, the EU and other climate-conscious countries and blocs have a responsibility to support both the most vulnerable countries and the fair decarbonisation of their own shipping industry by introducing or expanding national or regional carbon pricing. This would provide a price signal and generate revenue to support the transition at this critical moment. Scaling back ambition now risks stalling momentum at a critical turning point for international maritime decarbonisation.





IMO member states **must act to:**



Push for the adoption of the IMO NZF and rapid development of clear, enforceable, and science-based guidelines, robust life-cycle emissions accounting, the zero or near-zero fuel (ZNF) reward scheme, as well as the redistribution of revenue to small island developing states and least developed countries for their energy transition.



Strengthen regional measures, which currently remain the only regulations addressing shipping emissions. For example, the EU ETS geographical scope should be extended to cover 100% of emissions from voyages between the European Economic Area and other parts of the world.



Commit revenue to supporting the production of clean zero-emission fuels and technologies in the most vulnerable countries, helping to build trust that a just and equitable transition is achievable under the IMO NZF.



Ensure EU member states uphold agreed positions, avoiding the kind of divergence seen during the October extraordinary session, when Greece and Cyprus abstained from endorsing the EU's collective stance. Such divisions weaken the EU's collective capacity to support global action.



Demand higher ambition in the long term, pushing for more ambitious emissions reduction trajectories, a larger share of emissions priced, higher carbon prices, and penalties for non-compliance under the IMO NZF.



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Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor the granting authority can be held responsible for them.