



**Implications of the
Revised IMO GHG
Strategy for national,
regional and corporate
action**

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Preface

This report has been written by a team of experts from UMAS. The report aims to provide an initial analysis of the implications for national, regional and corporate actions from the Revised IMO GHG Strategy.

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Executive Summary

The IMO's Revised Strategy, adopted at MEPC 80, represents a major leap forward in ambition. It has brought the sector's required transition (from fossil fuels to scalable sustainable renewable fuels) into the decade of the 2030's: even at the lowest ambition interpretation of the strategy, the average ship's GHG intensity will need to have reduced by 86% by 2040. The era for any interim or transitional steps (many biofuels, blue fuels, onboard CCS, or other fossil fuels like LNG and LPG) that are not directly on the pathway to what the sector will need to look like in 2040, has been squeezed down to a handful of years - further undermining the likelihood of any viable business case.

The IMO MEPC outcome is an entirely avoidable surprise, as temperatures rise, disasters increase and pressure on those responsible to act increases. Yet the IMO's progress has now overtaken many of the national, regional and industry steps that were being taken in many cases in support of increasing IMO ambition, as well as to support the sector's transition in general. This raises several questions about the relevance and justification for those steps, and the aim of this paper is to provide an initial analysis of implications to such actions from the IMO outcome.

Generally, to remain relevant national, regional and corporate actions need to move to clear 1.5-alignment otherwise they will lag behind IMO's ambition and risk creating confusion, opacity, inaction and admin burden during the transition. But if these actions are strengthened and more carefully dovetailed into the nature of the transition IMO's Revised Strategy now signals, then there remains a key role to play for such actions to support and assist the sector, especially in the period to 2027-28 (before entry into force of further IMO regulation). **The IMO's Revised Strategy creates a very clear onus for a rapid and strong upwards revision of corporate, national and regional actions.**

The specific key findings are:

- Albeit not unambiguously 1.5°C-aligned, the IMO strategy's 2030 and 2040 targets (key guidance for investor's decision making) are in practice very close to the 1.5°C pathway targets (e.g. such as SBTi's guidance – see Figures 1 & 2 below). The risk and opportunity space is now more strongly and clearly defined. But by association, it is now much easier for any actor or initiative to adopt a clear 1.5°C alignment, whilst remaining broadly aligned with the mass market's rate of change and transition. **Recommendation - do not be complacent that decisions made on the basis of the IMO's 2018 initial strategy are sound, understanding and factoring in the new strategy's targets - especially the 2030 and 2040 targets is crucial.**
- Looking for guidance from the IMO's Revised Ambition should not be done without also looking at all wider levers of change - which themselves are likely to now increase. Shipping's transition has never been just about what happens at the IMO, it is about the interplay between various public and private behaviour and levers. Opportunities and risks exist in each of these spaces and where they overlap, interfere or reinforce. **Recommendation - develop your own decarbonisation strategy factoring all the levers of transition e.g. how does IMO's revised strategy and future regulation, in combination with national/regional/corporate actions create opportunities and risks?**
- Whilst many industry leadership efforts and initiatives have been ambiguous about fully aligning with the UN's guidance on how to avoid being labelled as 'greenwash', the pressure to align with 1.5°C is now even higher - otherwise what is being stated as leadership may be nothing more than compliance. Currently, none of shipping's existing corporate initiatives (including Poseidon Principles, Sea Cargo Charter, cargo owners for Zero Emissions Vessels), reference or align with the UN's guidance on integrity of voluntary net zero commitments. **Recommendation - apply and align with the UN's**

High-Level Expert Group on the Net-Zero Emissions Commitments of Non-State Entities guidance on integrity (alignment with IPCC's science on 1.5°C, including all scopes (1-3), use of interim targets and disclosure).

- The time window for national actions has been compressed, and their role/value is changing. There will always be a need for action on the domestic fleet (which is not covered by IMO regulation) so domestic maritime regulation remains important. For international shipping servicing a country, there is still a gap in legislative clarity until 2027/28 when IMO mid-term measures enter into force. So stimulating early adoption and first movers in that period remains important. Post 27/28, the IMO is likely to increasingly become the driver of the business case to invest, so relevance in that period can only be secured if actions significantly exceed the IMO's ambitions. This limits the period of relevance from national action hoping to 'kick-start' the sector's transition. Or seen from another angle, countries hoping to use policy to achieve a national strategic advantage in shipping's transition now have only a small window of time to do so before there will be much wider competition. **Recommendation - bring forward plans for national action to be particularly focused on the period from now to 2027/28, develop or align action on domestic shipping. Lower income countries with an opportunity in transition now have an urgent need to develop national strategies that can unlock the associated investment.**
- As we approach the second anniversary of the Clydebank Declaration, there have been many announcements of Green Corridors, but many of these remain in pre-feasibility or feasibility stages. Just as for other national actions that could be undertaken in advance of shipping's IMO-regulated transition, unless these are in place and running on zero or near-zero solutions significantly before 2030, the rationale and justification for such initiatives will no longer be valid as they will be making compliance steps. **Recommendation - bring forward public/private collaborations to ensure these have a chance of fulfilling their roles during the 2020's, and establish a norm/definition that Green Corridors must have zero or near-zero GHG operation significantly before 2030.**
- The stringency and role of currently announced regional policies (e.g. inclusion of shipping in EU ETS, EU fuel standards), now appears of very low salience/relevance to business cases, relative to what should be anticipated from the IMO's mid-term measures. The partial coverage of a ship's annual fuel consumption (unless operating solely in EU), and the limited potential to incentivise zero or near zero emissions in advance of the IMO's regulations, all question their additionality in the transition. The EU ETS policy increases the inequity of the transition (increasing cost to developing country trade, whilst transferring these revenues to high income countries). **Recommendation: the FuelEU standard needs to be revised to a higher stringency and consideration should be given to more equitable access and use of EU ETS revenues, as well as how these regional policies can support the IMO's Revised Strategy and harmonise with the coming global measures.**

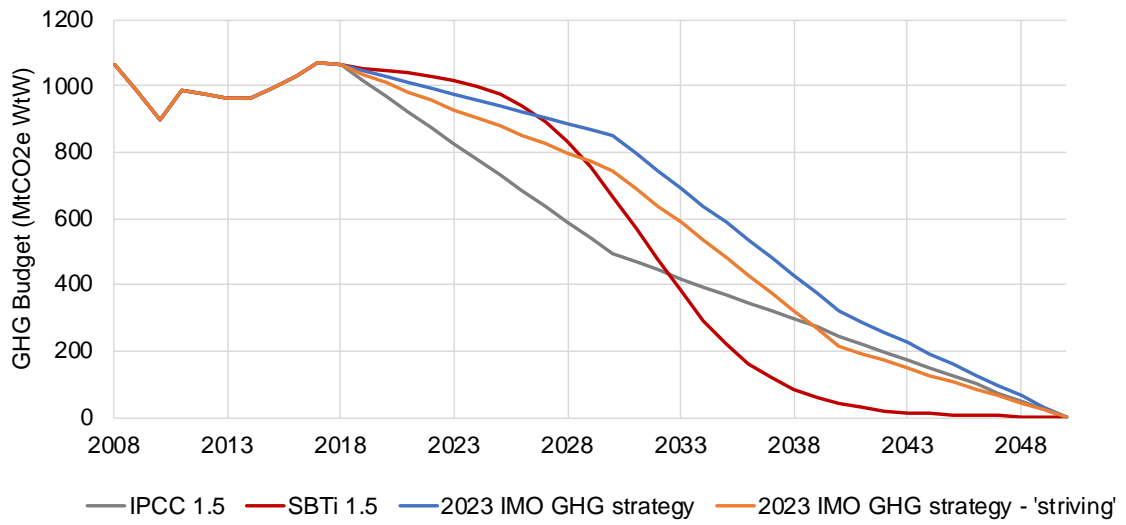


Figure 0.1: The new IMO GHG reduction targets when compared against 1.5°C pathway projections

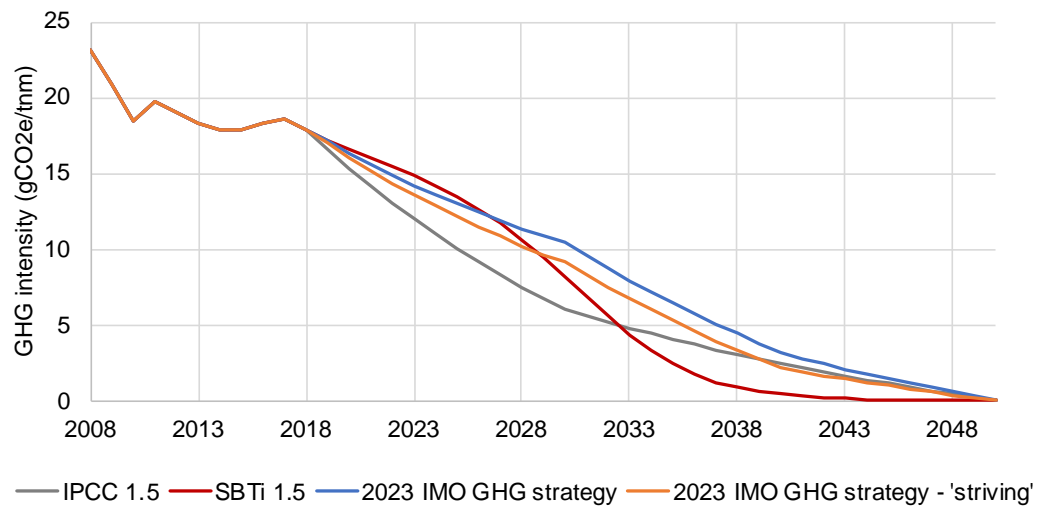


Figure 0.2: SBTi and IMO GHG strategy GHG intensity trajectories

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1 IMO's revised strategy is a quantum leap in ambition and speed of transition

On 7th July, IMO agreed its Revised Strategy - a non-legally binding agreement that specifies the parameters (rates of GHG reduction, timetable for further work, guiding principles and objectives) for the further GHG policy-making undertaken by IMO. For a detailed description of what this contains, see UMAS readouts from the meetings¹. The key developments are:

- The adoption of a new set of targets including net zero GHG by/around 2050, and GHG reductions (calculated on a well-to-wake basis) on a 2008 baseline of:
 - 20%, striving for 30% reduction by 2030
 - 70%, striving for 80% reduction by 2040
- The adoption of a target for zero and near zero GHG emission fuel use (as a share of the total energy used in international shipping) of 5%, striving for 10%, by 2030
- The commitment to adopt mid term measures, to enable these GHG reductions and to contribute to a 'just and equitable' transition, by the end of 2025 (which leads to entry into force in 2027)

However, much of the coverage and reporting since the outcome has been strongly critical. One of the main criticisms being that the Revised Strategy is not aligned with the Paris Agreements' 1.5°C temperature goal, for example, because the GHG reduction rates that are specified are not as ambitious as those specified by the IPCC's AR6 report, as the rates of GHG reduction that are needed.

This is most obvious when looking at the results graphically. Figure 1 shows an overlay of the IMO's 2030 and 2040 checkpoints, along with an interpretation of the 2050 target (assuming no offsetting). Relative to the IPCC's guidance, the IMO's adopted pathways underperform until ~2040, but then have a similar trajectory to 2050.

The SBTi 1.5 pathway has been developed for shipping as an alternative way to fulfil the IPCC's GHG budget (it is calculated to have the equivalent cumulative/total emissions over the period 2020-2050), whilst ensuring coherency with the UN guidance on integrity in voluntary GHG reduction commitments². The SBTi 1.5 pathway recognises that the achievement of deep/steep GHG reductions is dependent on a fuel transition which is better suited to significant scale-up in the 2030's than the 2020's. As a result, the GHG reduction trajectory is less steep and requires lower reductions by 2030. However, to 'catch up' with the required cumulative GHG reductions, the pathway steepens in the 2030s, overtaking the absolute reductions of the IPCC 1.5 pathway in the early 2030s to reach near zero GHG emissions around 2042.

The IMO's adopted pathways adopt a similar shape (commonly referred to as an 'S-curve' or sigmoid curve), and follow similar pathways to ~2030, but are less steep over the 2030's, which is why they do not achieve a similar cumulative/total GHG reduction. However, this also leaves open the potential for further ambition increase in 2028 (the next date that the IMO will consider its GHG reduction strategy and its targets), which has the potential to align the 2040

¹ ISWG-GHG 15: <https://www.u-mas.co.uk/wp-content/uploads/2023/06/ISWG-GHG-15-overview-UMAS-1-1.pdf>

MEPC 80: <https://www.u-mas.co.uk/wp-content/uploads/2023/07/MEPC-80-overview-FAQs-UMAS-.pdf>

² UN (2022) Integrity matters: Net zero commitments by businesses, financial institutions, cities and regions https://www.un.org/sites/un2.un.org/files/high-level_expert_group_n7b.pdf

target and therefore the gradient 2030-2040, to the SBTi pathway and achieve a cumulative emission from the sector aligned to 1.5.

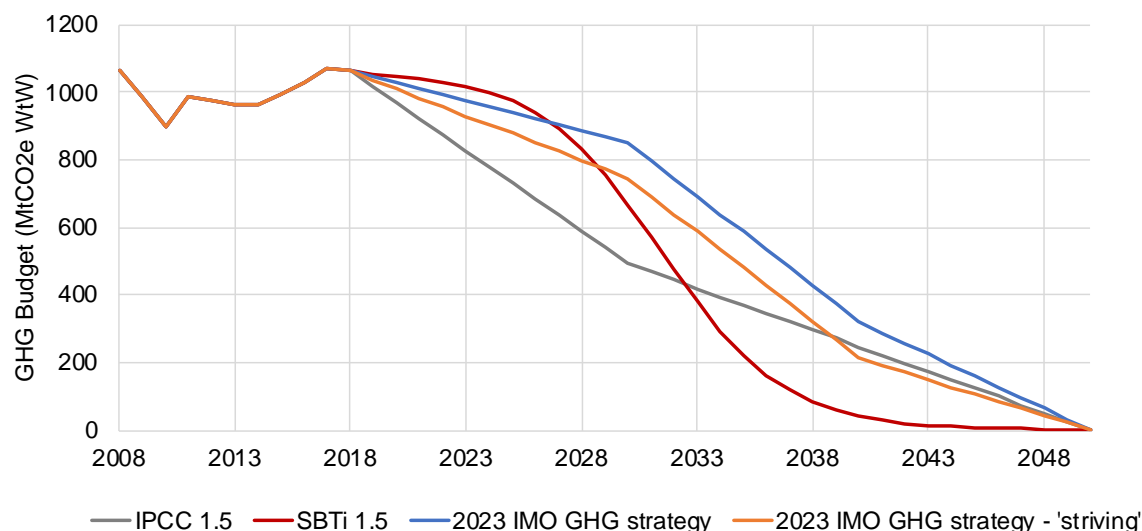


Figure 1: The new IMO GHG reduction targets when compared against 1.5°C pathway projections

However, taking the IMO’s adopted targets as they stand, as depicted in Figure 1, these result in estimates that correspond to a 1.6°C (67% confidence) temperature rise, and for the striving targets, 1.55°C (67% confidence) according to the budget defined by the IPCC³⁴. If a strengthening of ambition were to occur at the IMO’s next revision in 2028 (the next date that the IMO will consider its GHG reduction strategy and its targets), it has the potential to align the 2040 target and therefore the gradient 2030-2040, to the SBTi pathway and achieve a cumulative emission from the sector aligned to 1.5.

1.1 GHG reductions needed by the average ship implied by the IMO Revised strategy

A key feature of shipping’s decarbonisation is the expectation of continued trade growth - the growing population and growing wealth mean that, even when taking into account contractions in demand for fossil fuel (due to wider GHG mitigation policy), there is a sustained growth in demand for shipping and sea transport. Combining projections of growth in demand with the IMO’s latest GHG reduction targets results in steep GHG intensity reduction requirements for the average ship. Figure 2 compares those for each of the different IMO Revised Strategy values in 2030 and 2040, which shows that one consequence of considering the GHG intensity reduction (e.g. the reduction needed by the average ship) is that there is no room for complacency. Because trade has grown and is expected to continue to grow in the period

³ [Analysis](#) from the International Council on CleanTransport (ICCT) concluded that the Revised Strategy implies a well below 2°C emissions budget (around 1.7°C). This difference stems from the assumptions around projected emissions between 2018 and 2023 and emission factors. UMAS analysis assumes emissions start to decline in 2018 which is the latest year for which the Fourth IMO GHG Study provides an emissions inventory of international shipping.

⁴ IPCC (2021) [Climate Change 2021. The Physical Science Basis](#). Table SPM.2

2008 to 2030, the targets of 20% and striving for 30% reduction by 2030 will only be achieved if the average ship achieves much greater levels of reduction by 2030 (~55% GHG intensity reduction by 2030 on 2008). Fortunately, the sector is already half way there - the progress made to 2018, before the advent of the recently adopted short-term measures (CII and EEXI), is around a 30% reduction in GHG intensity. However, the steps needed to get from 2008 to 2018 (significant adoption of slow steaming, some efficiency optimisation), and both to 2030, and 2040 are not likely to be the same. The sector will need to sustain a high focus on these required future GHG intensity reduction rates if they are going to form a strategy to successfully navigate the next 15 years.

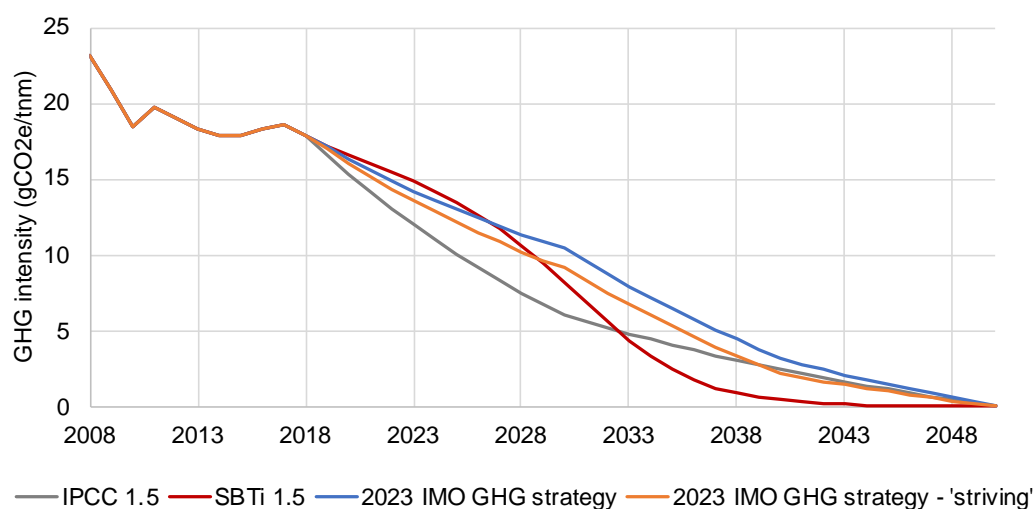


Figure 2: SBTi and IMO GHG strategy GHG intensity trajectories

1.2 Technology and operational implications for the average ship, from the IMO's revised strategy

The Revised Strategy creates implications both in the near-term to 2030⁵, and the mid-term to 2040 and 2050⁶:

- 2030 - maximising energy efficiency
- 2040 - near full transition away from fossil fuels to zero emission (renewable energy and hydrogen-derived) fuels

Energy efficiency maximisation requires all the candidate options that have been explored and mooted to now be applied at speed and scale over the remainder of this decade. This includes full deployment of logistics and operational optimisation (removal of inefficiencies in the voyage profiles, contracting and 'queuing' process), wind assistance, and the adoption of broader technological and operational efficiency improvements that can aggregate to the average 30% improvement across the international shipping fleet in the period 2018-2030. In 2040, the near full decarbonisation by the average ship (86-91% GHG reduction), even after efficiency has been maximised, can only be achieved through substitution with zero and near-

⁵ Smith, T.W.P, Bonello, J., Kapur, A. (2023). How can international shipping align with 1.5oC – focus on 1.5oC alignment in 2030. UMAS, London <https://www.u-mas.co.uk/unlocking-much-greater-efficiency-improvement-is-key-to-aligning-shipping-to-1-5oc-by-2030/>

⁶ IMO (2023a) Review of evidence on emissions reduction pathways, Submitted by the United Kingdom to the IMO Marine Environment Protection Committee, MEPC 79 INF.29, and IMO (2023b) Report on the study on the readiness and availability of low- and zero-carbon ship technology and marine fuels. IMO Secretariat, MEPC 80 INF.10.

zero GHG emission energy/fuels. This has implications for the nature of energy/fuel supply in 2040, but also in the period to 2040 as the wholesale changes required in fleet fuel compatibility and global production and distribution of energy/fuel cannot be delivered instantaneously.

A reduction of 86-91% is effectively full decarbonisation, or equivalent to what many stakeholders refer to as 'zero' GHG emissions today. This is because even for a ship designed and operating on a renewable energy produced fuel (e.g. a fuel derived from green hydrogen), there may need to be a pilot hydrocarbon fuel to aid combustion, and there may still in 2040 be traces of fossil fuel used somewhere in the production/distribution and storage of these fuels.

There are many 'lower GHG' fuel/energy options that could be used to achieve the GHG reductions at any point in time preceding 2040 for example: biofuels, blue fuels derived from fossil fuels using carbon capture on land, onboard carbon capture for onwards sequestration. However, the timescale to 2040 is so short that unless these options are going to be a competitive option for the effectively full decarbonisation in 2040, they will only be in compliance with the expected regulation for a short period of time. This does not mean that these options will not be used. But it does make their business case significantly more challenging (given the short-period over which to generate a return on investment), so their role has been diminished.

For these reasons, one of the key implications from the revised strategy is the need for a rapid ramp-up in scalable zero emission fuels (SZEf), and the need for a transition of the global fleet and all activities supporting and enabling its operation (seafarers, ports etc.) to the supply and use of SZEf.

2 What are the phases implied by IMO's Revised Strategy?

Statements on the technological and especially fuel/energy transition can be daunting. A transition's perspective can provide some insight and guidance, by considering how equivalent changes have unfolded in the past. Fuel transitions usually have three phases, 'Emergence' where a new fuel/technology is still not competitive and widely adopted, 'Diffusion' where a rapid scale-up of the new fuel/technology takes place, and 'Reconfiguration' where the new fuel/technology replaces the established system and becomes dominant⁷. It can be argued that the Levels of Ambition, Guiding Principles and section on candidate measures in combination specify all three phases of transition. As outlined in Figure 3, different parts of the 2023 Revised Strategy are likely to affect different aspects of the shipping transition, discussed in further detail below.

⁷ Smith et al. (2021). A Strategy for the Transition to Zero-Emission Shipping, <https://www.globalmaritimeforum.org/content/2021/10/A-Strategy-for-the-Transition-to-Zero-Emission-Shipping.pdf>

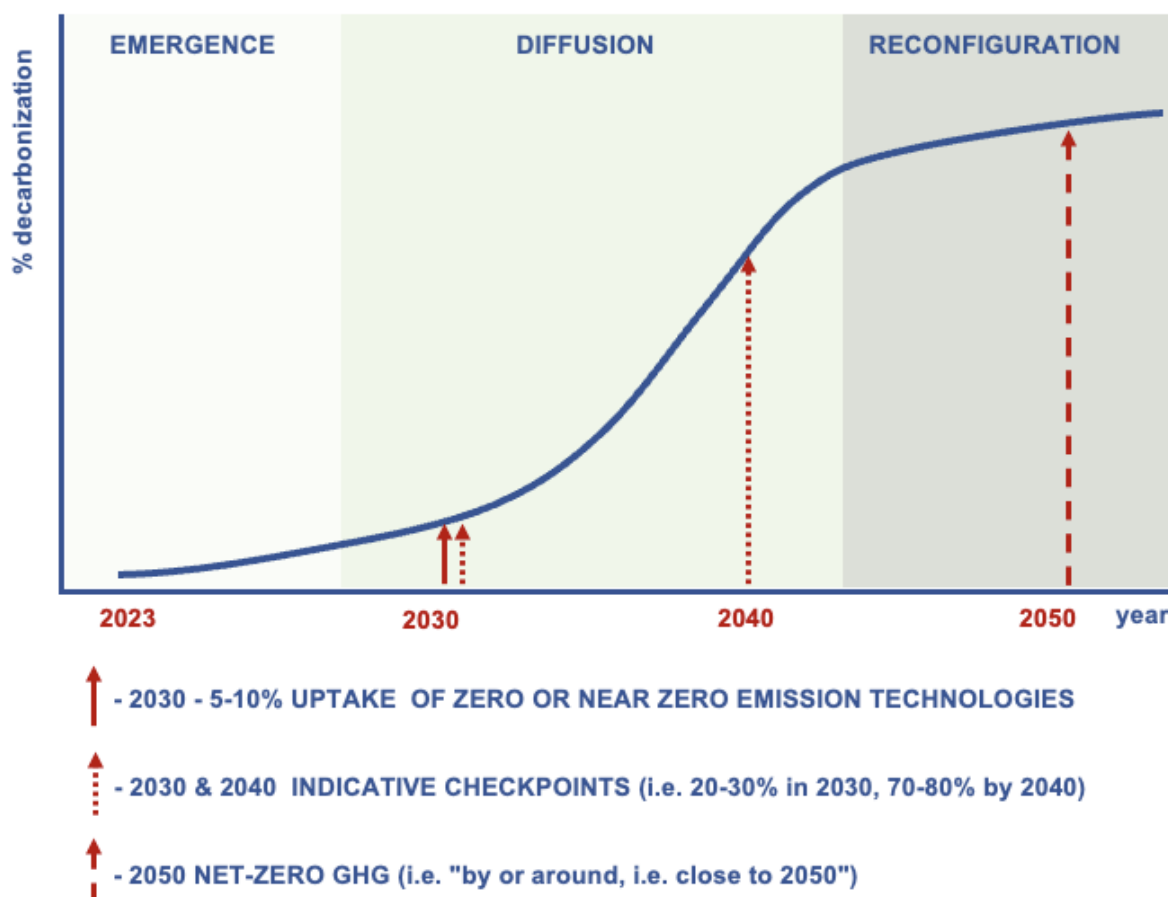


Figure 3: S-Curve zero emission fuel adoption (and decarbonization) mapped against the Revised IMO GHG 2023 Strategy⁸

2.1 Emergence phase (2020-2028)

Section 4.5 of the Strategy states “the GHG reduction measures should effectively promote the energy transition of shipping, and provide the world fleet a needed incentive”. This means that the mid-term policy measures will need to be designed to make sure that emergence of new technologies is stimulated both in the fleet and on land (...the energy transition...). However, in practice this is late. None of the components of the Revised Strategy on their own directly drive the ‘Emergence’ phase, but together they create a facilitative environment in which shipping is presumed to be rapidly heading towards the ‘Diffusion’ phase. The ‘Diffusion’ phase should be well under way by 2030 if the stated 5% -10% energy mix targets are met, as such a milestone would create multiple path dependencies and interrelationships which would make scalable zero emission fuels (SZEf) viable for a range of uses and markets⁹. In this sense the 5%-10% target when combined with the understanding that development of the basket of candidate mid-term measures ‘*should take into account the well-to-wake GHG emissions*’, creates more business certainty for investors into SZEf production projects such as green ammonia or methanol that there will be demand for their products by the 2030s. Additionally, it disincentivizes fossil-based options such as LNG, as these cannot play a long-term role under such scenarios. Finally, the announced measures make it clear that green

⁸ Adopted from Smith et al. (2021). A Strategy for the Transition to Zero-Emission Shipping

⁹ Baresic, D. and Palmer, K. (2022). Climate Action in Shipping. - Progress towards Shipping’s 2030 Breakthrough, UMAS, Race to Zero, 2030 Breakthrough. https://www.u-mas.co.uk/wp-content/uploads/2022/09/GTZ_ClimateActionInShipping_FINAL.pdf

corridors will have a viable business case, and that out of over 20 announced corridors¹⁰ many should be pushed ahead by several years so that by 2030 they can be operational and meeting at least partially that 5-10% energy mix target. Analysis has shown in the case of the Western Australia to East Asia iron ore ammonia green corridor that by 2028 ammonia fuelled vessels could be operational on the water¹¹ ahead of the 2030 5-10% target.

2.2 Diffusion phase (2028-2042)

In contrast to the ‘Emergence’ phase, the Revised Strategy directly specifies the development of the ‘Diffusion’ phase in shipping. The measures which will need to be introduced to reach the 5-10% target mean that there will be a requirement for the rapid scale-up and optimisation in the supply chain of SZEF, in addition to improvement of technological performance. This means that the shipping industry should already start investing into SZEF-ready vessels, preparing crew to operate such vessels, and collaborate with bunker suppliers on development and consequent scale-up of SZEF-bunkering infrastructure. Such developments can then lead to positive feedback loops and further lowering of costs¹². The diffusion phase is then further strengthened by the existence of the 2040 ‘*indicative checkpoint*’ which if reached would mean the industry was at a late stage of the diffusion phase in 17 years time. This should create high confidence for a large volume of investments in SZEF. The above should then be further strengthened by any market based measure which is aligned with the indicative checkpoints and the 2050 Level of ambition.

2.3 Reconfiguration phase (2042 onwards)

If industry actors make investment decisions according to the current signals and the mid-term measures are well aligned with the targets outlined in the Revised Strategy, it is entirely likely that the ‘Reconfiguration’ phase can be reached by the early 2040s leading to a fully decarbonized shipping industry by 2050. However, when it comes to a 1.5°C aligned trajectory, this will not only depend on the quality of the basket of mid-term measures, but also on the willingness of shipping industry and SZEF-producing stakeholders, both incumbents and new entrants to take the current signals from the Revised Strategy as a call to action and be rapidly prepared to meet targets which are less than a decade away. With such a mindset, a 1.5°C aligned shipping industry is within reach.

2.4 Overall implications and “progressing the virtuous circle”

In 2021, Getting to Zero launched the “Transition to Zero-Emission Shipping”¹², this remains one of the few reports to have applied a socio-technical transition theory lens to the sector’s shift away from fossil fuels. The study highlighted that the transition is not all about the IMO, with the following guidance that remain pertinent even under the Revised Strategy:

- Industry leadership, collaboration and early-stage investment is critical for the ‘emergence’ phase
- Embracing actions at all regulatory levels, and guiding them to maximum coherence and complementarity to IMO policy, is a winning strategy

¹⁰ GMF (2022). Annual progress report on green shipping corridors, <https://www.globalmaritimeforum.org/content/2022/11/The-2022-Annual-Progress-Report-on-Green-Shipping-Corridors.pdf>

¹¹ GMF (2023). Fuelling the decarbonisation of iron ore shipping between Western Australia and East Asia with clean ammonia, <https://www.globalmaritimeforum.org/press/the-west-australia-east-asia-iron-ore-green-corridor-is-within-reach>

¹² Smith et al. (2021). A Strategy for the Transition to Zero-Emission Shipping <https://www.globalmaritimeforum.org/content/2021/10/A-Strategy-for-the-Transition-to-Zero-Emission-Shipping.pdf>

- The essential thing is to move from a stand-off, where each party places conditions on action, to a virtuous cycle, where each party takes what actions it can in order to embolden the actions of the other

Based on this analysis, the final outcome of the ‘shape’ of GHG reductions has not been determined, but the IMO outcome now passes the baton to other actors, to do their part. The transition-theory perspective is clear that the Revised Strategy creates an onus for rapid and strong upwards revisions of corporate, national and regional actions.

3 Implications for private sector standards and corporate actions

Private voluntary action and governance, referred to as ‘private standards’ have the potential to address social and environmental challenges such as climate change. This is particularly justified by the transition theory perspective that early mover action through private action is crucial in the emergence phase of shipping’s transition. However, previous research on the role of private standards e.g. Clean Cargo Working Group, Clean Shipping Index, Green Award, etc. in decarbonising shipping showed that they suffered from low levels of transparency, ambition and data reliability, undermining the environmental effectiveness of the standards¹³. More recent analysis¹⁴ suggests that the newer standards e.g. Sea Cargo Charter and Poseidon Principles were more transparent, reliable and ambitious than previous standards but still had room for improvement in all three areas.

The key area for improvement for the recent standards e.g. Sea Cargo Charter (SCC), Poseidon Principles (PP), Poseidon Principles for Marine Insurance (PPMI), Cargo Owners for Zero Emission Vessels (coZEV), remains on the ambition of the standards to be aligned with the latest climate science. At present none of these align with the basic requirements for ‘integrity’ in voluntary commitments published in 2022¹⁵, for consideration/recognition as ‘net zero aligned’. This specifies a minimum requirement that:

- Pledge/targets/pathway must be generated using a robust methodology consistent with limiting warming to 1.5 with no or limited overshoot, for example SBTi 1.5
- All scopes of emissions (scope 1, 2 and 3) and all operations along its value chain and jurisdictions should be included
- Pledges/targets must include interim targets

One of the UN’s recommended sources for climate-aligned target setting in the industry, is the Science Based Targets Initiative (SBTi) maritime guidance¹⁶. SCC, PP, PPMI have a stated intent to revise upwards in ambition, including in the case of PP an intent to align with 1.5, but

¹³ See for example: Scott, J., Smith, T., Rehmatulla, N., & Milligan, B. (2017). The promise and limits of private standards in reducing greenhouse gas emissions from shipping. *Journal of environmental law*, 29 (2), 231-262.

<https://academic.oup.com/jel/article/29/2/231/2870500>

Gibson, M., Murphy, A. J., & Pazouki, K. (2019). Evaluation of environmental performance indices for ships. *Transportation Research Part D: Transport and Environment*, 73, 152-161.

<https://www.sciencedirect.com/science/article/abs/pii/S1361920919307333>

Poulsen, R. T., Hermann, R. R., & Smink, C. K. (2018). Do eco-rating schemes improve the environmental performance of ships?. *Marine Policy*, 87, 94-103. <https://www.sciencedirect.com/science/article/abs/pii/S0308597X17304475>

¹⁴ Rehmatulla, N. and Schwarz, K (Forthcoming) Revisiting the Role of Private Actions and Standards in Decarbonising Shipping

¹⁵ UN (2022) Integrity matters: Net zero commitments by businesses, financial institutions, cities and regions

https://www.un.org/sites/un2.un.org/files/high-level_expert_group_n7b.pdf

¹⁶ SBTi. (2023). [Science Based Target Setting for the Maritime Transport Sector](https://www.sbtigroup.com/~/media/SBTi/2023/Science-Based-Target-Setting-for-the-Maritime-Transport-Sector).

they currently remain based on the IMO minimum levels of ambition from 2018 IMO strategy¹⁷. The coZEV initiative has a long-term target that is aligned with science (e.g. zero GHG by 2040) but lacks interim targets which are crucial from a climate perspective and for compatibility with UN guidance on integrity in a voluntary commitment.

Fortunately, the IMO's Revised Strategy has positive implications for the alignment of shipping's private sector and corporate actions to the UN's guidance. Figure 4 shows the SBTi trajectories and the outcomes from the recent revision of the IMO GHG strategy are quite closely aligned. Furthermore, with regards to the GHG intensity pathways and level of reduction required at the ship level, Figure 4 shows there is little difference between SBTi and the IMO derived targets in the 2030 and 2040 indicative checkpoints, especially when considering that the vessel will have to undergo similar levels of modifications to meet the targets. It should therefore be much easier for any actor or initiative to adopt a clear 1.5 alignment, and move to align to the UN's guidance, whilst remaining broadly aligned with the mass market's rate of change and transition as derived from the IMO's Revised Strategy.

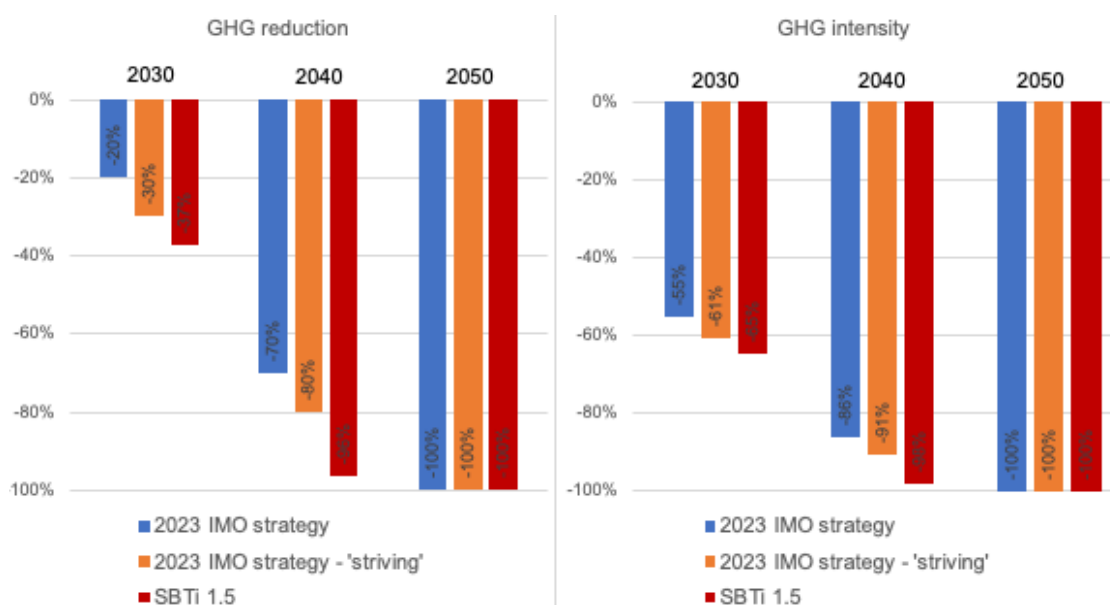


Figure 4: GHG reductions required under the 2023 strategy and 1.5 pathway

A further reason why corporate actions are well advised to align to the UN's guidance is related to the IMO's process which is built upon a multilateral consensus-building approach and ratcheting up ambition over time. This risks the private sector making the wrong investments and could lead to stranded assets when regulations eventually catch up. This risk is already evidenced through the strength of the ambition increase in the Revised Strategy: the IMO has already shifted its consensus-built position on GHG several times. As recently as 2015, there was consensus at IMO that GHG emissions from the sector should not be capped, followed by 'at least 50% GHG reduction by 2050' in as little as 3 years (2018) and now (2023) reaching net-zero by around 2050. As long as there is misalignment with IPCC advice to policymakers, there will be a ratcheting up of ambition over time¹⁸.

¹⁷ In their last respective disclosure reports, the initiatives acknowledged the initial strategy revision at MEPC 80 however, it is still to be seen when and how ambition is updated to account for the revised strategy.

¹⁸ Smith, T. (2022) Aligning with 1.5 degrees: Managing the risks and opportunities for shipping and the companies in its value chain <https://www.globalmaritimeforum.org/publications/aligning-with-1-5-degrees-managing-the-risks-and-opportunities-for-shipping-and-the-companies-in-its-value-chain>

4 Implications for national action

The IMO's Fourth GHG Study was the first of its kind able to produce greenhouse gas inventories that distinguish domestic from international emissions on a voyage basis in line with IPCC guidelines. It calculates that during a voyage 30% of the total emissions are discharged in domestic waters.¹⁹ For example, a ship may stop more than once within a country loading/unloading in multiple ports, before undertaking an international voyage. The emissions that occur from an internationally trading ship between ports of the same country are counted by the IPCC as domestic emissions.

This information highlights that a significant share of emissions of ships trading internationally occur within the scope of national domestic emissions inventories and should be included within countries' Nationally Determined Contributions. Domestic shipping, e.g. shipping which only trades within and between a country's ports, is not impinged on by IMO regulation, and so will need its own national/domestic regulatory framework. In 2023, there remain few regulatory regimes designed to transition domestic shipping, although the EU's Fit for 55 is an exception to this.

Domestic shipping is typically undertaken by smaller and lower cost ships, with correspondingly smaller and lower cost land-side investments and therefore typically presents lower cost and risk opportunities to undertake pilots and trials of new technology and fuels. Furthermore, investment in this sector is typically more likely to demonstrate national benefits than investment in international shipping, which can make it easier to justify public spending decisions. Whether domestic or international shipping, the need for governments to step up action and ambition is also highlighted in the context of green corridors, including through the alignment of supply-side policy (e.g. national hydrogen strategy) to the creation of a stronger demand-side pull (e.g. incentivizing zero emission use of hydrogen-derived fuels in shipping)²⁰.

Development of domestic shipping regulation is under the control of governments and can move faster than the timescales for implementation of IMO regulation, particularly where domestic shipping GHG reduction pathways align well to those needed for international shipping. These are all reasons why domestic shipping regulation is an opportunity for countries with responsibility or ambition to demonstrate leadership for shipping's transition.

Developing strong national action plans (NAPs) creates the potential to combine climate change mitigation, adaptation policy and with economic development. It can, for example, increase the case for investment in renewable energy and enable wider opportunities for sustainable economic growth. Co-benefits²¹ include reducing shipping's health impacts and environmental damage, as well as lowering dependence on imported fossil energy, attracting direct investment and developing infrastructure. Through leveraging local/national expertise and know-how, and work with regional and international organisations, research institutes,

¹⁹ IMO (2020) Fourth IMO GHG Study. <https://www.imo.org/en/ourwork/Environment/Pages/Fourth-IMO-Greenhouse-Gas-Study-2020.aspx>

²⁰ GMF (2023) National and regional policy for green shipping corridors, https://cms.globalmaritimeforum.org/wp-content/uploads/2023/09/Global-Maritime-Forum_Insight-Brief_National-and-regional-policy-for-green-shipping-corridors-1.pdf

²¹ According to Helgenberger, S. Jänicke, M. & Gürtler, K. Co-benefits of Climate Change Mitigation, https://link.springer.com/referenceworkentry/10.1007/978-3-319-71063-1_93-1

Co-beneficial approaches to climate change mitigation are those that also promote positive outcomes in other areas, such as air quality and health, economic prosperity and resource efficiency

and civil society organisations among others, both the economic and technological needs of countries can be assessed for use in these action plans. National action is particularly helpful in this ‘emergence phase’ of the transition and can decrease uncertainty while measures are discussed and decided on.

The significance of the emissions of internationally trading ships in domestic GHG emission inventories, as well as the need to drive a transition of domestic shipping independently from IMO regulation, are both reasons for action at the national level, or more specifically the establishment and implementation of NAPs and domestic shipping regulation. Since the adoption of the Initial Strategy and a specific resolution relating to NAPs, states have been encouraged to develop and update national action plans that include strategies to address GHG emissions from international shipping. NAPs should also address GHG emissions of domestic shipping and there are often opportunities to find synergies between the decarbonisation of domestic and international shipping.

To ensure coherency and consistency, the MEPC 80 outcome of a Revised Strategy means that existing NAPs and any developed or developing plans for regulation of domestic shipping should be checked or updated for alignment to the Revised Strategy’s targets and framing.

For those countries that do not already have a NAP or domestic regulation, there is now a stronger justification to develop one, including for countries in a range of circumstances:

- For a country intending to be competitive in leading the transition (for example countries aiming to be a leading exporter of energy commodities, technology, provider of seafarers) there is now a smaller period of time to act to take competitive advantage, before the mass market transition.
- For lower income countries with a predisposition or natural advantage to the maritime sector (e.g. importance for trade or on trading routes, potential for lower cost renewable energy, heritage in seafarer provision), there is now an excellent prospect of investment and opportunities that arise from the IMO’s commitment to contribute to a just and equitable transition. A NAP or equivalent can help to identify the key needs, justification and domestic stakeholder landscape for that investment.

To reinforce the IMO’s efforts, when taking action on the national level, States need to ensure that within the Revised Strategy, the newly included concept of a just and equitable transition is not undermined.

5 The interplay between regional and global measures

The IMO’s Revised Strategy contributes to a growing uncertainty from industry stakeholders around the interplay between regional regulations for shipping and global measures from the IMO. At the regional level, and as part of its Fit for 55 package, the EU has four pieces of legislation which are applicable to shipping; FuelEU, the extension of the Emissions Trading System to include shipping, the Renewable Energy Directive (RED) and the Alternative Fuels Infrastructure Regulation (AFIR). In the US, some lawmakers are considering the idea of a carbon tax as part of the push for maritime decarbonisation²². Meanwhile, at a global level, with the adoption of the revised 2023 GHG Strategy, the IMO plans on adopting a package of

²² Lloyd’s List (2023) US lawmakers propose carbon tax on shipping. 9th June 2023
<https://lloydslist.maritimeintelligence.informa.com/LL1145399/US-lawmakers-propose-carbon-tax-on-shipping>

mid-term measures composed of a GHG intensity fuel standard and an emissions pricing mechanism by Autumn 2025, which will enter into force in 2027. In this interim four-year window, many stakeholders are therefore looking to the EU regulations for guidance, specifically the FuelEU and ETS.

Under the FuelEU maritime regulation, ships will have to comply with the following energy GHG intensity reduction targets: 2% from 2025, 6% from 2030, 14.5% from 2035, 31% from 2040, 62% from 2045, 80% from 2050. FuelEU Maritime will apply to ships of 5,000 gross tonnage (GT) and above, that perform commercial voyages transporting goods or passengers.²³ FuelEU maritime will apply to 100% of energy used on voyages between European Economic Area (EEA) ports and 50% of energy used on voyages between EEA and non-EEA ports. While a voyage is defined as any movement of a ship, transporting passengers or goods for commercial purposes, that takes place between two ports, this definition is applied with the exception of when ships call at specific neighbouring non-EU transshipment ports, where the two voyage legs will be considered as one voyage.²⁴ The Review of FuelEU will take place by December 31, 2027 and every 5 years thereafter. For more information on how FuelEU works, refer to T&E briefing²⁵.

While FuelEU Maritime is lauded as the first ever regulation to drive the demand for renewable and low carbon maritime fuels through the mandated reduction of the GHG intensity of fuels used by ships with uptake requirements for renewable fuels,²⁶ it suffers some shortcomings. It only enters into force from 1st January 2025 and in recent analysis, Transport and Environment conclude, *'the ambition and scope of the regulation still leave huge room for improvement, and more needs to be done to put shipping on a Paris-compliant trajectory [...] FEUM green-lights a slow-motion transition away from fossil fuels in shipping, with oil-based fuels and fossil gas still likely to make up the majority of fuel demand until 2045.'* Among their recommendations for improvement is to align the greenhouse gas intensity targets with the 1.5°C-compliant SBTi emissions trajectory²⁷.

The extension of the EU emission trading scheme (ETS) to cover shipping means that a price on shipping emissions has been introduced for the first time. From January 2024, the EU ETS will apply to the shipping sector and will cover all 100% of emissions from internal EU voyages as well as 50% of emissions from voyages starting or ending outside of the EU. From 2024 to 2026 the ETS will cover CO₂ emissions and from 2026 onwards, methane (CH₄) and nitrous oxide (N₂O) will also be included. Shipping companies only have to surrender allowances for a portion of their emissions during an initial phase-in period:

- 2025: for 40% of their emissions reported in 2024;
- 2026: for 70% of their emissions reported in 2025;
- 2027 onwards: for 100% of their reported emissions²⁸.

²³ No fishing vessels, private yachts, service vessels or military vessels will have to comply.

²⁴ The list of these neighbouring ports to be drawn up by the EU Commission every two years.

²⁵ Transport & Environment (2023), How does FuelEU Maritime work? https://www.transportenvironment.org/wp-content/uploads/2023/07/202307_FUEM_Explainer_Briefing_2023_TE.pdf

²⁶ Transport & Environment (2023). Modelling The Impact Of FuelEU Maritime On EU Shipping <https://www.transportenvironment.org/wp-content/uploads/2023/07/FuelEU-Maritime-Impact-Assessment-July-2023.pdf>

²⁷ Ibid

²⁸ EU Commission (2023). Reducing emissions from the shipping sector. https://climate.ec.europa.eu/eu-action/transport/reducing-emissions-shipping-sector_en

Relative to the stringency of the IMO's Revised Strategy, the FuelEU has lower ambition in all of 2030, 2040 and 2050. For example, under the FuelEU, GHG intensity in 2040 requires a 31% reduction below 2020 level as opposed to the Revised Strategy GHG intensity reductions of ~86% to ~91% below 2008 level. The FuelEU and ETS extension do occur in advance of the implementation timescale for IMO's mid-term measures. However, they do so at low stringency on a partial share of globally trading ship's international emissions - and EU ETS extension is a further partial share of the in-scope emissions, until 2027. The package also lacks any direct efficiency regulations - the key near-term opportunity for GHG reductions in shipping. Therefore, the EU does not provide any significant contribution to drive shipping's transition before the IMO's mid-term measures enter into force, and at their current lower stringency are lagging behind IMO's expected incentivisation both in stringency and coverage.

A reporting and review clause is included to monitor the implementation of the rules applicable to the maritime sector and to take into account relevant developments in the IMO,²⁵ presumably with the intention of better harmonising regional regulations with a global package of measures. However, there is no obligation or commitment for the EU to do anything beyond 'review'. While pricing emissions from shipping is considered a progressive step forward, questions arise on the equity of the EU ETS for shipping.²⁹ There are a number of specific exemptions that apply to the ETS and moreover, the revenues generated will be recirculated in the EU through the Member State budgets, the Innovation Fund and Modernisation Fund, meaning that value derived from global trade will predominantly be retained within the EU system causing inequities to arise.³⁰

Aside from the specific shortcomings of the current EU regional regulatory package, and in light of the timeline for mid-term measures from the IMO, on a conceptual level further regional regulations for the shipping sector now become less attractive for the following reasons:

- Complexity - different regional systems may have significant variation across key elements, for example reporting and certification, system integrity, transparency, and may also put a greater burden on ship owners when multiple systems apply to ships during a year.
- Uncertainty - different regional policies may incentivise different fuel/technology choices thereby increasing uncertainty around investments for the sector.
- Equity - regional actions do not promote an equitable transition as they stimulate shipping's transition in regional pockets, which leaves other countries behind in terms of mitigation, adaptation and opportunities to realise the benefits of the new markets created for zero emissions fuels and vessels. If pricing is used - as in the EU ETS system, there is a high risk that revenues will only be recirculated within that same region, despite being derived from global trade. This is the case with the EU ETS and could well be the same with other regional systems.
- Fairness - Regional policies and measures are generally designed by the regional stakeholders and developed to suit the region itself. If they apply to global trade as the EU

²⁹ Parker, S., Shaw, A., Rojon, I., Smith, T. (2021). 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. Environmental Defense Fund Europe, London. <https://www.u-mas.co.uk/wp-content/uploads/2021/12/UMAS-2021-Harnessing-the-EU-ETS-to-reduce-international-shipping-emissions.pdf>

³⁰ Applications to the Innovation Fund require projects to be implemented in one of the EU Member States, Norway or Iceland (Article 10a(8) of [Directive 2003/87/EC](#)), although the project application does not need to be controlled by EU investors. The Modernisation Fund is aimed to support 10 EU Member States to meet 2030 energy targets. The States targeted are Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania and Slovakia.

ETS does, a region has imposed regulation on a global activity. The IMO is the only forum where 175 countries can negotiate a global regulation for the shipping industry and therefore it is the only forum where there is potential for a fair process with regards to representation.

- Cost - a patchwork of regional measures may increase the overall cost of the transition in comparison to a single global package of measures, especially in terms of the administrative cost of multiple systems.
- Disproportionately negative impacts - while the IMO has a process in place to assess the impacts of measures on both the global fleet and States and identify disproportionately negative impacts on states, which can be fed into the process of adopting mid-term measures, regional regulations typically do not go through the same comprehensive process.

In their preliminary review of proposed global measures, UNCTAD comments that the emergence of different tiers of overlapping regulations could also create tiers of compliance, for example, *'If a GHG mitigation policy (e.g. fuel standards or an economic measure) is implemented regionally or is designed with many route exemptions, there is a high risk of carbon leakage and excessive tax base erosion because ships could alter their route to evade the system and/or refuel easily outside its jurisdiction. It could also pave the way to regional pockets of unsustainable and substandard shipping.'*³¹

With regional regulation falling short of what's needed, both practically and conceptually, for international shipping's transition, rather than additional regional regulation, it would be preferable to see regional action plug the four-year gap between now and the entry into force of global regulation. Transition theory suggests that the greatest need in this period is a technology push approach that stimulates and supports early movers and incentivises the research, development and deployment of zero emissions fuels, technology and infrastructure. There will remain a role for regional regulation where it encompasses national domestic shipping GHG emissions (as in the case of EU regulation), as domestic shipping emissions are not covered by IMO regulation.

Mitigation of emissions is paramount and regional action can be used to encourage first movers in the transition's emergence phase, however, the value of a globally-led transition directed by the IMO's package of measures should not be underestimated, when compared with a patchwork of regional technical and economic measures. While there is often frustration expressed with the speed and stringency of IMO regulation, in the interest of simplicity, certainty, equity, fairness, cost and impacts, the work done at IMO on mid-term measures should be a focal point for all shipping stakeholders. Not having a strong set of mid-term measures developed in this fora because of resources diverted to regional action would be a missed opportunity.

³¹ UNCTAD (2023) UNCTAD preliminary expert review of the technical and economic elements, and their possible combinations, of the proposals for candidate mid-term GHG reduction measures. MEPC 80/INF.39/Add.1 by the Secretariat. IMO, London.

6 Concluding remarks

The IMO's Revised Strategy is neither definitive nor a panacea. It is just another piece of the puzzle that needs to be used by the shipping industry's stakeholders, to help understand what the transition might look like. The most clear signposts are those associated with GHG ambitions and targets, but there are important pointers in the detail of the strategy, about the nature of transition which the IMO will be regulating to achieve.

As importantly, the Revised Strategy has shifted the landscape. Its strength means that the wider efforts to stimulate the transition risk becoming irrelevant - by producing outcomes that are not 'first' or 'early' but merely aligned to compliance. Whilst a broad network of initiatives that support compliance might still have value, it is a different value to what they could achieve if they are proactive enough to compliment the ambition of the IMO and help to elongate the period of transition. Elongation of transition remains an important contribution from any off-IMO initiative related to decarbonisation e.g. bringing the start date of transition before IMO's regulations apply, to maximise the length of transition and reduce risks for incumbent fossil technologies and investments and create early opportunities for de-risking and cost-reducing the solutions the sector will ultimately need. This makes the period from now to 2027/8 of particular relevance and focus. As does making sure that the ambitions of any industry/national/regional efforts are clearly aligned to 1.5.

Important signals from the IMO process by no means end in 2023. The next 2-3 years is scheduled to see an intensive period of policy development - a schedule that has importantly been clarified in the Revised Strategy. Even the interim steps to the formulation of both the new mid-term measures (GHG pricing and a fuel standard), as well as the revision of short-term measures will be key both for creating further guidance on how the sector needs to prepare, but also what gaps might still remain and therefore how wider efforts and initiatives can maximise their relevance and additionality.