

Dual Actions: National and Route-Based Plans to Tackle GHG Emissions from International Shipping

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Section 1: Background and Objectives

Reducing greenhouse gas (GHG) emissions in international shipping has become a key agenda for the IMO in recent years. In 2020, the *Fourth IMO GHG Study* was published, providing technical insights into the specifics of international shipping's historical GHG footprint, and predicting possible future emission trends up to 2050.¹ In 2021, the Energy Efficiency Existing Ship Index (EEXI) and annual operational carbon intensity indicator (CII) and CII rating were announced in MEPC 76, to establish minimum energy standards for all vessels.² These efforts have been driven by the goals outlined in the 2018 Initial IMO GHG Strategy. Given the substantial investment necessary to meet these expectations, a framework guiding fund-management on an international level is required.

In this paper, we propose a solution built around Maritime Route-based Action Plans, which will complement the IMO's existing National Action Plans³ to provide a structure for organising decarbonisation initiatives. We further elaborate on the respective funding schemes necessary to ensure that these action plans translate into concrete GHG reduction across the globe. While this paper does not address funding sources or collection mechanisms, we believe support can be sourced from revenue-generating market-based measures, such as global carbon levies or cap-and-trade systems, or from member states' contributions, development banks, or even the international capital market. In 2020, Trafigura proposed a global carbon levy at approximately USD300 per metric tonne of CO₂.⁴ Similarly, the International Maritime Research Fund (IMRF), as proposed by the International Chamber of Shipping, can be an avenue with which such a scheme is implemented. Underpinning this paper is the appreciation that realising decarbonisation goals, be it through R&D of new green technologies, or capacity-building to enable technology adoption, remains costly. Furthermore, member states have varying needs, and depending on their available resources, will demand flexible solutions. Effective disbursement of funds accrued will require a comprehensive and inclusive framework.

We seek to address two questions in this paper. Firstly, how can the returns from decarbonisation funding be maximised? Secondly, what guiding principles should be

¹<https://wwwcdn.imo.org/localresources/en/OurWork/Environment/Documents/Fourth%20IMO%20GHG%20Study%202020%20-%20Full%20report%20and%20annexes.pdf>

² <https://www.imo.org/en/MediaCentre/PressBriefings/pages/MEPC76.aspx>

Amendments will enter into force on 1 November 2022, certifications for 2 indexes are required from 2023.

³ <https://www.imo.org/en/OurWork/Environment/Pages/RELEVANT-NATIONAL-ACTION-PLANS-AND-STRATEGIES.aspx>

⁴ <https://www.trafigura.com/media/2752/a-proposal-for-an-imo-led-global-shipping-industry-decarbonisation-programme.pdf>

adopted in deciding how funds are distributed? We adopt a systems perspective to argue for a broad-based approach, integrating infrastructure, vessel, and GHG reduction opportunities across all levels of technology. This principle guides our central proposal of dual National and Route-based Action Plans, to be implemented concurrently or independently, depending on the local conditions. We explain the intentions and advantages of each method. This paper can help operationalise both the guiding principles the IMO should embody in managing this system, and the management and funding of the Action Plans. The aim is to provide practical recommendations that guide maritime shipping to the concrete GHG emissions reductions it requires.

Section 2: A Systems Perspective and the Need for Dual-Action Plans

To answer the two questions, we adopt the view that international shipping can be modelled as a web of routes with vessels plying between ports, or along fixed routes connected by a series of ports, that supply the necessary fuel. Emissions are produced along these routes, which differ according to the traffic volume, while ports (or their respective port states) differ in their access to fuel and technical capability. Effective decarbonisation requires holistic consideration of the technology, infrastructure, cost and GHG emissions of these routes. Without aligning these factors, emissions reduction capabilities will be constrained by the weakest factor, in any route. Decarbonisation plans that cannot account for the full maritime system are less likely to meet their GHG emissions reduction targets.

The systems perspective of the maritime industry emphasizes the need to have decarbonisation efforts focus both on ports as well as the vessels that ply the routes between them. Therefore, the allocation of funds should be directed towards two schemes – national action plans that focus on reducing GHG emissions within a state’s jurisdiction, and route-based action plans that target emissions reduction between routes. These two action plans act in unison to collectively reduce GHG emissions from the maritime industry.

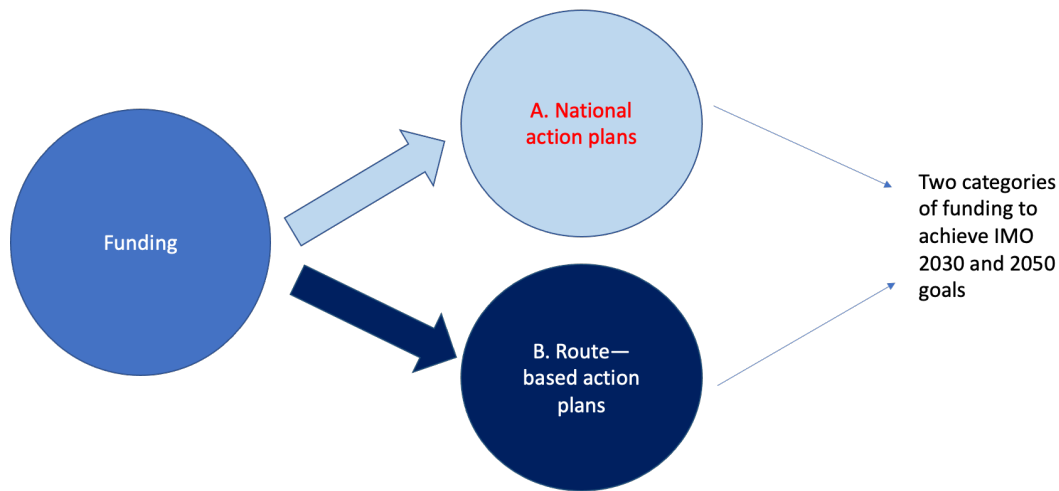


Figure 1. Funding National and Route-based Action Plans

National Action Plan

In Nov 2020, the Marine Environment Protection Committee (MEPC) adopted Resolution MEPC.327(75)⁵ encouraging IMO member states to develop and submit voluntary national action plans to reduce GHG emissions. This aims to facilitate decarbonisation in shipping, starting from a national context. For these plans to work, substantial financial resources are needed. Such challenges are further exacerbated by economic difficulties many states, particularly those developing, low-income and small states, face after tiding through the many months of the Covid-19 pandemic⁶.

Thus, we propose that revenue collected from decarbonisation schemes should be used to fund initiatives identified in national action plans that have a direct and immediate impact on GHG emissions reduction in local and international shipping. In particular, Least Developed Countries (LDCs), Small Island Developing States (SIDS) and other developing countries, should have priority in accessing funds for their national action plans. Unlike developed countries, which have substantial financial resources and technical capabilities to drive decarbonisation, their less developed counterparts lack the resources to follow suit. For some technologies, initial adoption of decarbonisation schemes by developed nations means they have already undertaken the bulk of research and development costs. With the appropriate adaptation to meet local conditions, implementation of these existing, tried-and-tested solutions by developing nations represents a strong and outsized avenue for potential emissions reductions. External organisations, like the IMO, can provide the

⁵ Encouragement Of Member States To Develop And Submit Voluntary National Action Plans To Address GHG Emissions From Ships

⁶ See <https://www.worldbank.org/en/news/feature/2021/06/08/the-global-economy-on-track-for-strong-but-uneven-growth-as-covid-19-still-weighs>

necessary impetus through financial support, technology transfer and localisation assistance for national action plans.

Route-based Action Plan

According to the *Fourth IMO GHG Study*, historically, emissions from international shipping has been about 7 times that of domestic shipping and fishing sectors when calculated using the vessel-based approach, or about 2.5 times that of domestic shipping and fishing sectors when using the voyage-based approach. Clearly, the bulk of emissions for shipping, broadly speaking, happen between ports, outside any country's jurisdiction. However, without ports, these voyages would also not be feasible. Thus, route-based decarbonisation efforts must be centred on coordination and investments that span across jurisdictions, pooling the interests of maritime states to accelerate GHG emissions reduction.

Maritime routes vary in multiple aspects, such as traffic, types of vessels, GHG emissions reduction potential and proximity to green fuel sources. As such, ground-up, route-specific action plans from the relevant ports of call involved should be adopted. The widely varying conditions on the ground render a top-down, one-size-fits-all approach ineffective. Such reductive measures negate route-specific nuances, and ultimately stifle efforts to reduce GHG emissions. Instead, we advocate for a greening-one-route-at-a-time approach that is driven by local needs, capabilities, and availability of resources. Swift uptake of such route-based action plans should accelerate the creation of green shipping networks.

Section 3: Operationalisation

Guiding Principles

Developing a set of guiding principles ensures that the funding accrued can enable GHG emissions reduction in a timely, cost-efficient and equitable manner. Distribution of funds should adhere to these proposed principles to ensure an equitable distribution between IMO member states. In this section, we propose five core tenets that should guide the stewardship of funds, from the inception of relevant projects to the management of their outcomes. Given this paper's emphasis on producing tangible GHG emissions reduction, we also cover the operationalisation of these principles to meet the levels of ambition set in the Initial IMO GHG Strategy. Table 1 provides a summary of each principle.

1. Scope

First and foremost, all avenues for enabling decarbonisation should be supported. The scope for funding should be kept as wide as possible, so long as a clear link to maritime decarbonisation and achieving the IMOs goals for 2030 and 2050 can be established. Operationalised, this has two implications. More directly, funds must have decarbonisation as their priority, as opposed to other economic goals. However, this also means that projects do not have to be R&D-focused. Seeking funds through the national action plan for infrastructural development or capacity building, to enable the adoption of decarbonisation solutions, are perfectly acceptable goals, just as R&D projects on low Technology Readiness Level (TRL) initiatives. Countries vary in their decarbonisation potential, technical readiness and cost of GHG abatement. Thus, all projects should be considered for funding so long as they lead to GHG emissions reduction in the local context and the routes involved.

2. Objectives

Decarbonisation projects should be judged according to their potential returns to the stakeholders involved and aligned with the IMO 2030 and 2050 goals. For Route-based action plans, achieving the two simultaneous goals of expedient and cost-efficiency methods to reduce GHG emissions requires that funding supports projects with the highest return on investment. One possible benchmark would be the lowest cost per ton of emissions reduced. Projects should be weighed according to established technical benchmarks. After the potential for decarbonisation has been established and objectively proven, those deemed most deserving then receive the necessary support. Ultimately, the funding of route-based projects should aim at maximising decarbonisation.

3. Autonomy

The use of funds, particularly for the national-action plans, should be proposed and managed by IMO member states involved in the actions plans. Operationalised, this means that decision-making authority is decentralised, and local actors are empowered with the autonomy to decide on the allocation of funds. Underpinning this perspective is that member states are in the best position to decide what suits them, in recognition of unique local and route circumstances. Such decentralized authority prevents the inefficiency prevalent in top-down decision making. Furthermore, local authorities are more motivated and conscientious when implementing indigenously designed schemes, due to a sense of ownership and pride attached to the success of the project.

4. Accountability

The implementation of an international funding scheme must be predicated on accountability and transparency. While funded states should not face excessive auditing that hampers productivity, some form of international accounting protocol should be adopted so that the results of the funded projects can be aggregated and tracked against benchmarks and IMO’s aspirations.

5. Knowledge Sharing

Achieving rapid decarbonisation of the maritime industry requires knowledge sharing among member states. Effective and timely knowledge sharing allows shorter learning curves, greater economies of scale in solution deployment, as well as continuous improvement. Respect and enforcement for intellectual property should be upheld.

Table 1: Summary of Guiding Principles and their Operationalisation

Area	Guiding Principle	Operationalization
Scope	Funds used to reduce GHG arising from shipping/maritime solely.	Funds allocated can be used for any projects/capacity building/infrastructure that results in GHG emissions reduction, so long as it tackles emissions from shipping.
Objectives	Implementing decarbonisation measures deemed effective for specific routes should be encouraged.	Encourage, promote, and fund plans that give the highest return, e.g., lowest \$ per ton of CO2 removed.

Autonomy	IMO member states are in the best position to know what works for them.	Member states will propose how funding should be used, guided by their national and route-based action plans.
Accountability	Member states to uphold trust, accountability, and transparency.	Appropriate level of auditing from third parties with member states self-reporting to an international protocol on projects and results on a periodical basis.
Knowledge Sharing	IP Ownership and knowledge sharing to benefit all.	Recipients of funds own foreground IPs arising from the work but are encouraged to share knowledge and progress to extend applicability elsewhere, shorten learning curves, and economies of scale of solution deployment.

Management and Funding Schemes

To differentiate and ease the operationalisation of the action plans, we shall label the national action plans as Scheme A, and the Route-based action plans as Scheme B.

Scheme A focuses on funding projects identified in national action plans submitted to the MEPC by IMO member states. For states yet to have a plan, funds can be channelled into conducting the necessary studies for creating one. The amount allocated to a country can take into account factors, such as its GDP, the size of the maritime/shipping sector relative to its GDP, the potential for GHG emissions reduction, as well as the time when the reduction can be achieved. These projects can vary from technology development, infrastructure, capacity building or other initiatives that have a direct impact on GHG emissions reduction. Proposals should be submitted by member states and be reviewed by an international board.

Scheme B supports projects proposed by member states and/or the private sector according to Route-based action plans. The amount allocated can be tied to factors such as the potential of GHG emissions reduction, the time when the reduction can be achieved, the number of member states and/or companies involved in the plan, and the GDP of the countries involved. These projects can vary from technology development through pilots and trials, infrastructure, capacity building or other initiatives that have a direct impact on GHG emissions reduction. Ideally, projects under Scheme B should demonstrate the viability of deploying low-GHG fuels or technologies for oceangoing vessels and include actual demonstrations of these solutions through cooperation between the participating member states and the companies involved. Co-funding from member states and/or companies would ensure alignment with national action plans and sustainability master plans, as well as securing their commitment.

In operationalising these schemes, we provide three recommendations. First, the two schemes can be managed by a board with representatives from all regions, that reports to the IMO. The board's task will be to facilitate the funding process, while liaising with states to coordinate efforts across regions. As the international authority for shipping, the IMO can ensure inclusivity for all states, by providing a level playing field for countries seeking access to funding. This ensures that maritime decarbonisation can progress on a global scale. Second, to promote knowledge sharing, we recommend that the findings and results from all projects funded under both action plans be shared in the form of periodic publications and seminars, even though IP may still belong wholly to the funding recipients. Finally, while IMO member states are the main drivers for these action plans, participation and contributions from NGOs, private organisations and other stakeholders, including international maritime research centres, such as the Maritime Technology Cooperation Centres (MTCCs), Maersk McKinney Moller Centre for Zero-Carbon Shipping and the Global Centre for Maritime Decarbonisation (GCMD), should be welcome. The wealth of practical experience and insights these organisations bring would enrich abatement efforts, especially to advise and assist in technical areas where government authorities may not have the relevant expertise.

Table 2. Preliminary concept on national and route-based action plans

Criteria	A. National action plans	B. Route-based action plans
1. Eligibility	Member states	>1 Member state, on co-funding basis
2. Decarbonisation potential	CO2 abatement by a certain time	CO2 abatement by a certain time
3. Funding Amount	Based on factors such as GDP, income, size of maritime industry, GHG reduction potential.	Based on factors such as number of IMO member states involved, GHG reduction potential, and the cost of abatement.

Section 4: Conclusion

This paper has laid the foundations for a broad framework enabling decarbonisation in the shipping sector on a global scale. We have highlighted the importance of inclusivity throughout each section. First, a systems perspective of the maritime industry is used to highlight the widely varying value chains across IMO member states, and the need for solutions that can account for these differences. Second, a Route-based Action Plan is introduced, to complement the IMO’s National Action Plans in crafting decarbonisation strategies for reaching shipping’s GHG emissions reduction targets. Finally, a comprehensive mandate of guiding principles for managing international decarbonisation funding is discussed. These principles, together with the funding of the action plans, can be operationalised in the IMO’s context to accelerate their implementation.

The urgent need for maritime decarbonisation is an established fact. Given the global nature of shipping, we emphasize that the process of seeking solutions must be built from the ground up through a system of inclusivity. While the sheer quantity of relevant actors worldwide may seem innumerable, adopting the right mindset allows for transparent and decentralised management of the funding process. Diversity across regions can thereby become a strength to be capitalised upon. With looming deadlines in GHG emissions reduction targets, all possible avenues of decarbonisation must be tapped into.

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