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PROBLUE

Distributing Carbon Revenues from Shipping

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Abbreviations

CBDR-RC.....Common but Differentiated Responsibilities and Respective Capabilities

CO_2 .....Carbon Dioxide

DNI .....Disproportionately Negative Impacts

GCF .....Green Climate Fund

GDP .....Gross Domestic Product

GHG .....Greenhouse Gas

GT .....Gross Tonnage

IMO .....International Maritime Organization

IPCC .....Intergovernmental Panel on Climate Change

ISWG-GHG.....Intersessional Working Group on Reduction of GHG Emissions from Ships

LDCs.....Least Developed Countries

LLDCs.....Landlocked Developing Countries

MEPC .....Marine Environment Protection Committee

SIDS .....Small Island Developing States

UNCTAD .....United Nations Conference on Trade and Development

UNFCCC .....United Nations Framework Convention on Climate Change

Executive summary

Background

The International Maritime Organization (IMO), the specialized United Nations agency responsible for international shipping, aims to reduce greenhouse gas (GHG) emissions from the shipping sector. International shipping accounts for approximately three percent of global GHG emissions. The Initial IMO GHG Strategy, adopted in 2018, aims to peak GHG emissions from international shipping as soon as possible, reduce them by at least 50 percent by 2050 over the 2008 levels, while pursuing efforts to phase them out on a pathway consistent with the Paris Agreement temperature goals. More ambitious GHG reduction targets are being discussed for inclusion in the revised strategy, which is expected to be finalized in July 2023.

The IMO is currently negotiating the policy measures that must be adopted to meet GHG emissions reduction targets. Achieving the sector's climate targets requires a policy environment that maximizes energy efficiency, supports the uptake of zero-carbon bunker fuels and technologies, and makes them cost-competitive with fossil-based fuels. In line with the Initial IMO GHG Strategy, climate negotiations at the IMO are focused on identifying additional measures ("mid-term measures") to reduce GHG emissions from ships. Such measures could materialize as technical standards or market-based measures like carbon pricing instruments.

Carbon pricing in international shipping can help reduce GHG emissions and generate significant carbon revenues. Many shipping stakeholders are advocating for the adoption of a revenue-raising market-based measure as part of a basket of measures to reduce GHG emissions from ships. Such measures could take the form of a carbon levy, including different levy designs such as feebates, or an emissions trading scheme. Modeling estimates indicate that a market-based measure in international shipping could raise between $1 trillion and $3.7 trillion by 2050. This would correspond to an annual average of $40 billion to $60 billion between 2025 and 2050.

As IMO stakeholders are deliberating how carbon revenues could be used, three notable use options appear most aligned with key considerations. Submissions to the IMO Marine Environment Protection Committee (MEPC) and the Intersessional Working Group on Reduction of GHG Emissions from Ships (ISWG-GHG) discuss how carbon revenues could be used, managed, and governed. Previous World Bank analysis distinguished seven potential carbon revenue use options and assessed their alignment with the Initial IMO GHG Strategy, selected principles, and desirable features. Using carbon revenues to decarbonize shipping, enhance maritime transport infrastructure and capacity, and support broader climate aims appeared most aligned compared to alternative spending options. While the first two options directly relate to maritime transport, financing broader climate aims, by contrast, would imply spending funds beyond maritime transport.

This report discusses how these three key use options for carbon revenues can be considered within a distribution framework that aims to maximize climate outcomes and support an equitable transition. While a revenue-raising market-based measure can yield significant GHG emissions reductions, it can also help address the equity concerns of many IMO Member States. In that light, and building on previous analysis, this report unpacks the following questions:

i) Should spending revenues beyond maritime transport be further considered?
ii) Which country groups should be able to access carbon revenues?

The report also develops a distribution framework that can deliver both on maximum climate ambition and the need for an equitable transition.

Key findings of the report

1

A significant share of carbon revenues needs to be channeled to support shipping's decarbonization. Decarbonizing international shipping will require trillions of dollars in investments. To cover these costs to a certain extent, mobilize additional private and public finance, and achieve tipping points as quickly as possible, carbon revenues should be used to finance, scale up, and accelerate the decarbonization of international shipping.

2

Maximizing climate outcomes calls for financing climate action beyond maritime transport. Using a share of carbon revenues to support climate action more broadly can deliver even greater climate outcomes overall as it is unlikely that the most cost-effective opportunities to mitigate or adapt to climate change will all relate to maritime transport alone. There is, therefore, a climate-related case to use a share of carbon revenues beyond maritime transport.

3

An equitable transition can be facilitated by spending carbon revenues beyond maritime transport. Spending carbon revenues exclusively on maritime transport is likely to limit some developing countries' access to carbon revenues. Some developing countries, including many small island developing states (SIDS) and least developed countries (LDCs), as well as landlocked developing countries (LLDCs) have limited opportunities to spend carbon revenues on maritime transport. Therefore, using carbon revenues exclusively for maritime transport-related spending appears to be at odds with supporting an equitable transition.

4

Prioritizing developing countries as primary recipients of carbon revenues promotes a more equitable outcome. Developing countries tend to be more vulnerable to climate risks, have less capacity to address them, and have historically contributed less to climate change than many developed countries. Making developing countries the primary recipients of carbon revenues can help close the financing gap between current climate finance flows and their climate financing needs. In addition, carbon revenues can help address potential disproportionately negative impacts on States caused by implementing a climate policy measure in international shipping. Therefore, prioritizing developing countries as primary recipients of carbon revenues could promote a more equitable outcome. Besides, considering developed countries as complementary recipients of carbon revenues can further accelerate international shipping's decarbonization.

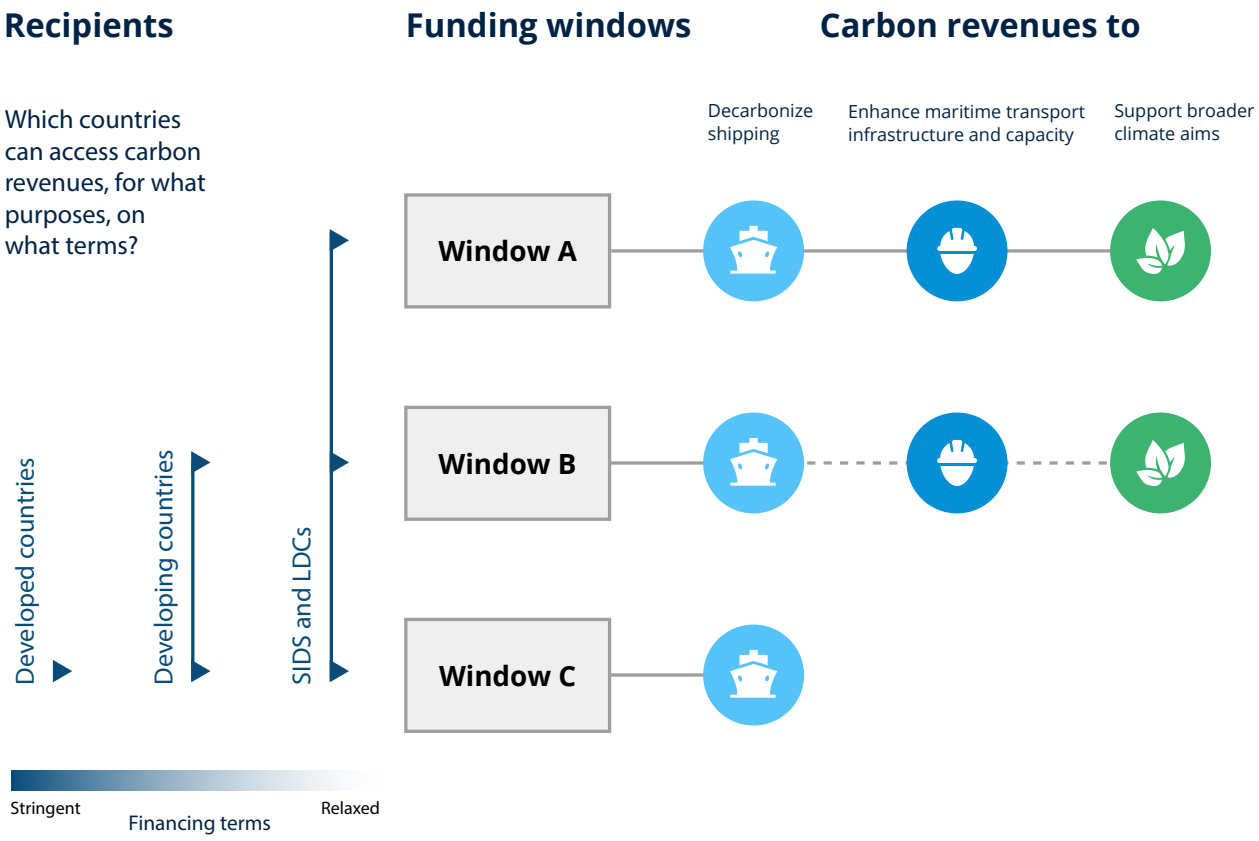
5

Reserving a share of carbon revenues for SIDS and LDCs strengthens their ability to access and use these revenues. Given the frequently reported capacity constraints of many SIDS and LDCs to prepare competitive funding proposals and their vulnerability to climate change, a reserved share of carbon revenues would be an advantage. This will shield them from competition with countries that face lower barriers to accessing climate finance or are less vulnerable to climate change.

6

A revenue distribution framework built around three levers and three funding windows can effectively deliver climate and equity benefits for countries. This report discusses a possible distribution framework for actively managed carbon revenues from international shipping that aims to maximize climate outcomes and to support an equitable transition. Drawing lessons from climate finance and accounting for key considerations of the IMO debate, such a framework can be built around three levers and three funding windows. Recipients, use options and financing terms are levers which can be adjusted to address climate and equity considerations. The three funding windows differ in their access and use modalities to account for varying development and climate circumstances across groups of countries.

Figure E.1: Possible distribution framework for carbon revenues from international shipping



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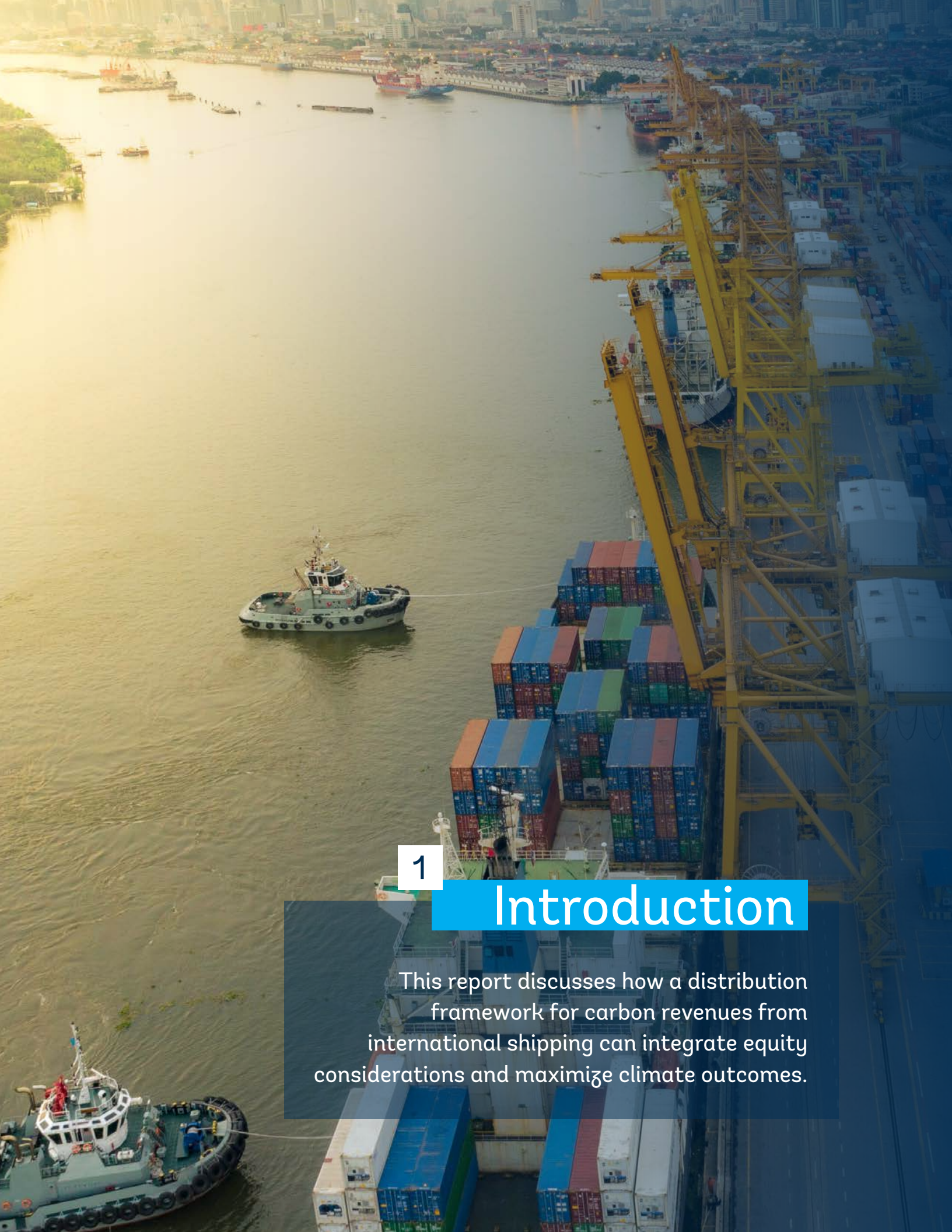


1 Introduction

This report discusses how a distribution framework for carbon revenues from international shipping can integrate equity considerations and maximize climate outcomes.

01 Introduction

International shipping accounts for a significant and growing share of global greenhouse gas (GHG) emissions. International maritime transport is the backbone of international trade, as more than 80 percent of global trade by volume is transported by sea (UNCTAD 2022a). As such, international shipping can play a significant role in greening the energy supply chain by carrying zero-carbon fuels, green technologies, and related components from producers to end consumers. At the same time, shipping accounts for a significant and growing share of global anthropogenic GHG emissions (Faber et al. 2020). While international shipping contributed around three percent of the total GHG emissions in 2018, the latest scenario analyses suggest that carbon emissions alone will grow by 90 percent-130 percent by 2050 over the 2008 levels (Faber et al. 2020).

> Shipping accounts for approximately three percent of global anthropogenic GHG emissions.

In 2018, the International Maritime Organization (IMO) adopted targets to reduce GHG emissions from international shipping. These targets are embedded in the *Initial IMO Strategy on Reduction of GHG Emissions from Ships* (Initial IMO GHG Strategy) (IMO 2018). Among other things, the Initial IMO GHG Strategy aims to peak GHG emissions from international shipping as soon as possible, reduce them by at least 50 percent by 2050 over the 2008 levels, while pursuing efforts to phase them out on a pathway consistent with the Paris Agreement temperature goals. Since 2018, an increasing number of stakeholders at the IMO[1] have called for more ambitious GHG reduction targets. IMO Member States have recognized the need to strengthen the level of ambition in the revised strategy (IMO 2021), which is scheduled for adoption at the 80th session of the IMO's Marine Environment Protection Committee (MEPC) in July 2023.

IMO stakeholders are discussing the policy measures that need to be adopted to meet the GHG mitigation targets. Achieving the sectoral GHG mitigation targets requires creating a policy environment that can help make zero-carbon bunker fuels and technologies available and cost-competitive with fossil-based fuels and technologies. Based on the timeline foreseen by the Initial IMO GHG Strategy, IMO negotiations are currently focusing on identifying additional measures to be finalized and agreed between 2023 and 2030. These are commonly referred to as "mid-term measures".

Among others, mid-term measures could include a revenue-raising market-based measure. Many shipping stakeholders (for example, IMO Member States, the Climate Vulnerable Forum, industry and civil society representatives) support the adoption of a revenue-raising market-based measure[2] as part of the basket of mid-term measures to reduce GHG emissions from ships (IMO 2023; CVF 2021). A revenue-raising market-based measure could take the form of a carbon levy, including different levy designs such as feebates, or the form of an emissions trading scheme where emissions allowances are sold (instead of allocated for free).[3]

[1] By "IMO stakeholders," the report refers to the membership of the IMO, which currently has 175 Member States, three Associate Members, 66 intergovernmental organizations with observer status, and 88 international non-governmental organizations with consultative status.

[2] Market-based measures are also often referred to as economic measures or instruments.

[3] This report focuses on market-based measures that put an explicit price on GHG emissions. Levies or taxes on fossil fuels that do not target the emissions, or the carbon content of fuels directly are not discussed here. On the difference between explicit and implicit carbon prices see Dominioni (2022).

A revenue-raising market-based measure would incentivize reductions in GHG emissions in international shipping, while raising carbon revenues. The key role of a market-based measure for international shipping is to incentivize reductions in GHG emissions in shipping. Instruments that put an explicit price on GHG emissions can be a key component of the policy mix that drives the decarbonization of international shipping cost-effectively. According to several studies, they have the potential to stimulate the production and uptake of alternative fuels and promote improvements in technical and operational measures on vessels (ITF 2022; Parry et al. 2018). In addition to yielding GHG emissions abatements, carbon-pricing instruments can raise considerable revenues. Estimates indicate that a market-based measure in international shipping could raise up to $3.7 trillion by 2050, depending on assumptions related to the carbon price and the emissions reduction trajectory, among others (Baresic et al. 2022; Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping 2021a). This corresponds to an annual average of $40 billion to $60 billion between 2025 and 2050 in collected carbon revenues (Dominioni et al. 2022). Box 1.1 provides more information on the possible level of a carbon price and the potential amount of revenues generated.

A carbon price in international shipping can generate **$40-60** billion annually.

Box 1.1: Potential level of a carbon price and the amount of revenues generated

Several studies have provided estimates of the carbon price level needed for international shipping to deliver a specific mitigation target and quantify the total, annual, or average carbon revenues raised.

- Building on different scenarios and techno-economic modeling conducted by Smith et al. (2019), Baresic et al. (2022) find that meeting the minimum mitigation target of the Initial IMO GHG Strategy requires implementing an average carbon price of $173 per ton of carbon. To fully decarbonize shipping by 2050, the average carbon price would need to be approximately $191 per ton of carbon. However, Baresic et al. (2022) propose that these carbon prices could be lower if revenues generated by a carbon pricing measure are 'recycled' to further support the decarbonization of shipping, for example, by subsidizing the deployment of zero-carbon fuels and technologies. Depending on the scenario and the level of revenue recycling, the average amount of revenue collected would range between $41 billion and $105 billion per annum, totaling between $1 trillion and $2.6 trillion by 2050 (Baresic et al. 2022).

- The Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping (2021b) illustrates an earmark and return carbon levy system, coupled with a global ban on fossil-fueled vessels once most of the fleet has transitioned to alternative bunker fuels. Here, the carbon levy would only need to be large enough to cover the difference in fuel costs incurred by the sector over its fossil alternative to transition to zero emissions by 2050. To compensate the first movers when they begin to transition, a levy can be sequentially phased in, starting at low levels that will gradually rise as more ships start using alternative, more expensive, lower-carbon fuels. A carbon price range of $50-$150 per metric ton of carbon dioxide (CO_2) equivalent would be needed under such a scheme. Further, the authors suggest implementing a levy higher than the cumulative additional cost of the sector to decarbonize, which would result in a buffer of funds to support developing countries and finance the necessary infrastructure, vessel retrofits, and research and development

- Research conducted by Trafigura and Texas A&M University suggests that a carbon levy of $250 to $300 per metric ton of CO_2 equivalent on marine bunker fuels is needed to make zero- and low-carbon fuels economically viable. The calculation of the level of the carbon levy is based on a lifecycle assessment of various fuels, which includes both well-to-tank and tank-to-propeller emissions (Trafigura 2020).

Other studies have tested a selected carbon price level against its GHG mitigation potential.

- Parry et al. (2018) model that a carbon tax rising from $75 per ton of CO_2 in 2030 to $150 per ton in 2040 would reduce CO_2 emissions below business-as-usual levels by nearly 15 percent in 2030 and by 25 percent in 2040. Estimates for the corresponding revenues raised are given for two years: $76 billion in 2030 and $155 billion in 2040.

- Lagouvardou, Psaraftis, and Zis (2022) investigate the potential of a carbon levy in achieving short-term CO_2 emissions reductions through slow steaming in the tanker market. The analysis finds that, depending on the scenario, a carbon levy ranging from $150 to $400 per metric ton of CO_2 can lead to speed reductions and, thus, result in CO_2 emission cuts of up to 43 percent in the short term. It is noted that in the long term, a levy can improve the cost-competitiveness of energy-saving technologies and alternative fuels and gather revenues, which will further enhance the viability and scalability of such technologies and fuels.

Many IMO stakeholders are already considering how such carbon revenues could be used, managed, and governed. Several submissions to MEPC and ISWG-GHG propose initial ideas outlining how these carbon revenues could be used and what their management and governance could look like. Ideally, these considerations would happen in parallel to the general deliberations about what form or forms of mid-term measures are best to decarbonize the sector. This is for at least two reasons:

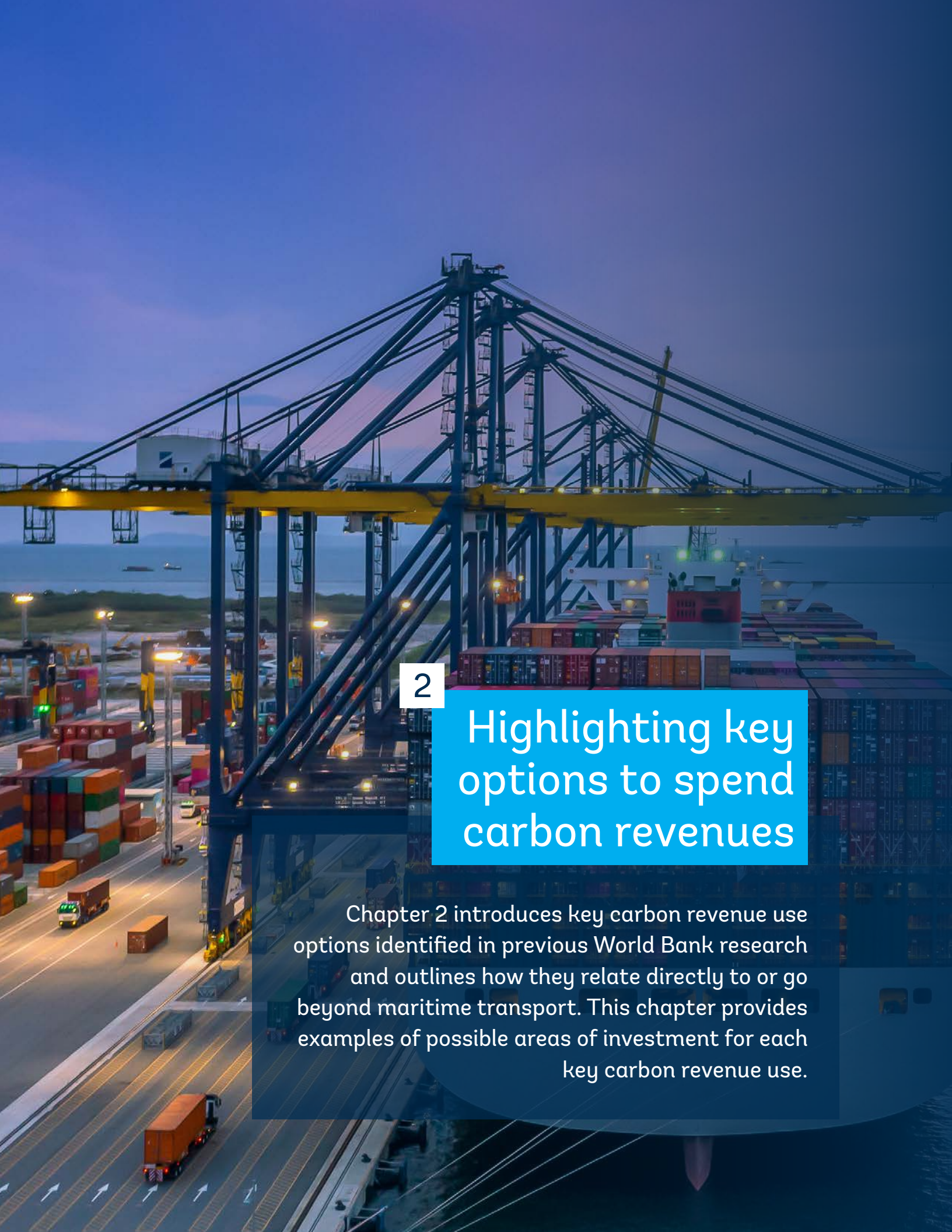
1. The strategic use of carbon revenues can accelerate and reduce the cost of shipping's decarbonization (see section 3.1)
2. Carbon revenues—and their management and governance—are relevant for addressing equity-related concerns in the energy transition of the sector (Dominioni et al. 2022).

For these reasons, the selection and design of mid-term measures to decarbonize shipping should consider the revenues that could be raised through a market-based measure.

The analysis presented in this report focuses on the use of carbon revenues that would be actively managed by a fund. A passive carbon revenue use does not require active management of carbon revenues because revenues are disbursed following predetermined rules that leave no discretion to implementing entities. While passive management uses, such as feebate schemes, could contribute to the decarbonization of international shipping and incorporate equity considerations, they are not discussed in this report. Instead, the report focuses on the active management of carbon revenues, whereby projects and programs financed are selected through a competitive bidding process to a fund (whether existing or novel). Under such a process, project proposals are submitted and assessed according to the policies and criteria of the fund. This is a common approach adopted in climate finance as the process helps in selecting projects and programs that are expected to align more closely with the expectations of the fund.

The report focuses on governments as recipients of carbon revenues. Previous World Bank research finds that governments are the most suitable recipients of carbon revenues from international shipping (see chapter 4). Nevertheless, actors from the private sector could still receive carbon revenues if this helps to yield greater climate outcomes. They could become recipients of carbon revenues either under a feebate scheme or through the bidding process (either directly or through governments if the latter act as intermediaries).

Chapter 2	Introduces key carbon revenue use options identified in previous World Bank research and outlines how they relate directly to or go beyond maritime transport. This chapter provides examples of possible areas of investment for each key carbon revenue use.
Chapter 3	Analyzes whether using carbon revenues exclusively for maritime transport-related spending is likely to maximize climate outcomes and support an equitable transition. It explains how key carbon revenue use options can contribute to achieving this twin goal.
Chapter 4	Discusses which countries could receive carbon revenues from international shipping and how prioritizing recipients could contribute to an effective and equitable energy transition of the sector.
Chapter 5	Outlines a possible distribution framework for carbon revenues from international shipping. This framework aims to achieve maximum climate outcomes and support an equitable transition.
Chapter 6	Concludes and translates the findings into key messages for policymakers.



2

Highlighting key options to spend carbon revenues

Chapter 2 introduces key carbon revenue use options identified in previous World Bank research and outlines how they relate directly to or go beyond maritime transport. This chapter provides examples of possible areas of investment for each key carbon revenue use.

02
Highlighting key options to spend carbon revenues

Previous analysis by the World Bank considered several potential carbon revenue use options and assessed their alignment with the Initial IMO GHG Strategy as well as selected principles and desirable features. In particular, Dominioni et al. (2022) considered the following six active carbon revenue use options alongside a revenue-neutral feebate scheme:

1. decarbonizing shipping
2. enhancing maritime transport infrastructure and capacity
3. supporting broader climate aims
4. achieving wider development goals
5. financing the general fiscal budget
6. covering administrative and enforcement costs of the market-based measure

The analysis considered the following principles due to their inclusion in the Initial IMO GHG Strategy[4] or relevance to the ongoing negotiations at the IMO.

- **Addressing the need to be cognizant of the principle of Common but Differentiated Responsibilities and Respective Capabilities (CBDR-RC).** The CBDR-RC principle sets out the common responsibility of all countries to address climate change while acknowledging that some countries have contributed less to climate change and have less capacity to address it. Such factors are to be accounted for in determining the responsibility of each country to act on climate change (Rajamani 2016).

- **Addressing the need to consider the impacts on States, including developing countries, in particular on small island developing states (SIDS) and least developed countries (LDCs).** Measures implemented to reduce GHG emissions from international shipping can have negative (and positive) impacts on countries, for instance, in terms of export opportunities or food safety. One of the guiding principles of the Initial IMO GHG Strategy is to consider the impacts of measures on States, including developing countries, in particular SIDS and LDCs. In this context, the Initial IMO GHG Strategy calls for assessing and considering the impacts of a measure on States before its adoption. Here again, particular attention is to be paid to the needs of developing countries, especially SIDS and LDCs. Consequently, disproportionately negative impacts (DNI) should be assessed and addressed, as appropriate.

[4] Three guiding principles explicitly mentioned in the Initial IMO GHG Strategy were not considered in this analysis. Two of them—the need to be cognizant of the principles of non-discrimination and of no more favourable treatment, and the requirement for all ships to give full and complete effect, regardless of flag, to implementing mandatory measures—relate to the implementation of measures. The third—the need for evidence-based decision-making balanced with the precautionary approach—is about procedural matters related to IMO decision-making. As such, these three guiding principles are not considered directly relevant to the potential uses of carbon revenues generated by a potential market-based measure applied to international shipping and were, therefore, not considered in the analysis.

- **The principle of Highest Possible Ambition.** The principle of Highest Possible Ambition was introduced in the Paris Agreement in 2015. It sets the expectation that parties will set and pursue mitigation targets at the highest level within their capabilities (Rajamani 2016).
- **The Polluter Pays principle.** The Polluter Pays principle has a long history in environmental law and policy. Though there are differing interpretations of its meaning, a prominent interpretation holds that the agent responsible for a polluting activity should be responsible for the costs of preventing and controlling pollution (Heine, Faure, and Dominioni 2020).

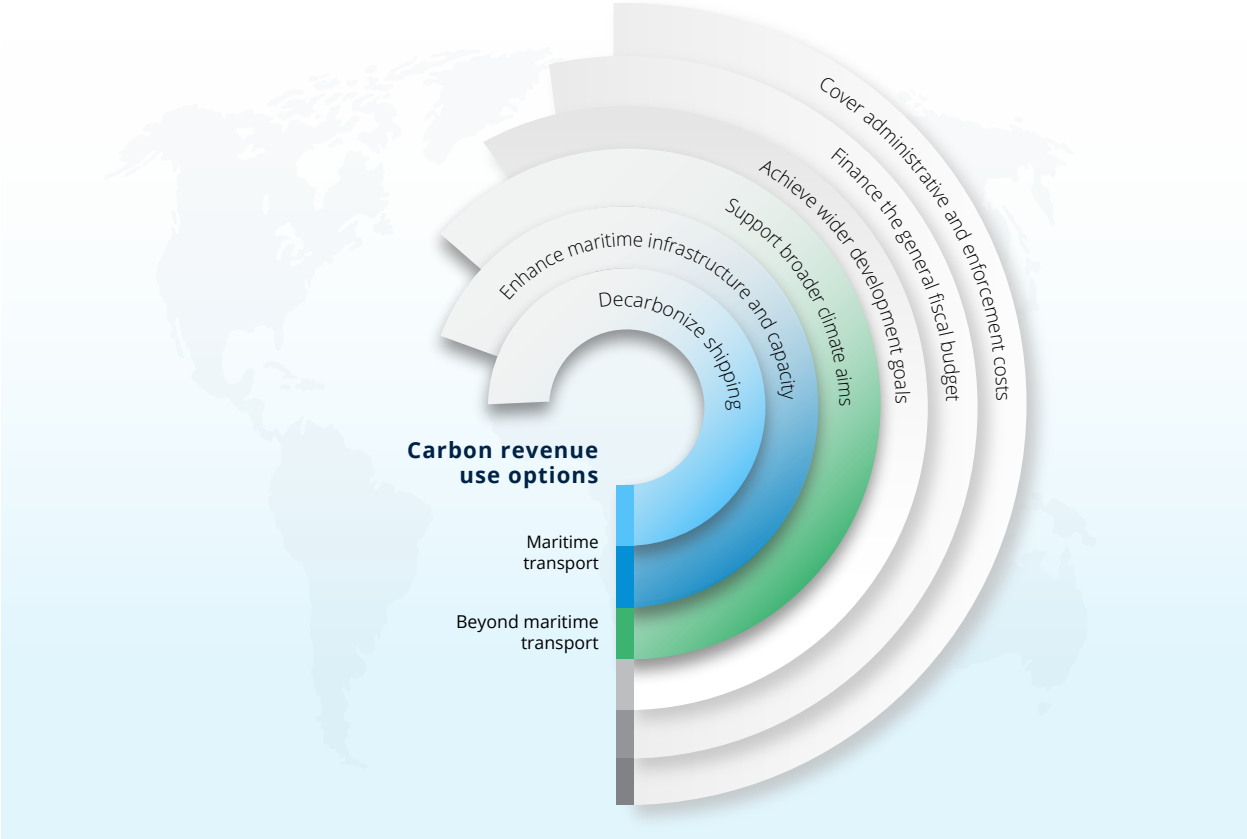
The analysis also assessed the alignment of potential carbon revenue use options with additional desirable features. These include the potential climate and development benefits of each carbon revenue use option, the need for active management, and their political feasibility from an industry perspective.

The analysis revealed that some carbon revenue use options appear more aligned with the Initial IMO GHG Strategy, selected principles, and desirable features. These are:

1. decarbonizing shipping
2. enhancing maritime transport infrastructure and capacity
3. supporting broader climate aims (Dominioni et al. 2022)

Figure 2.1 shows all the revenue use options analyzed that require active management and highlights the three use options most aligned with the Initial IMO GHG Strategy, selected principles, and desirable features.

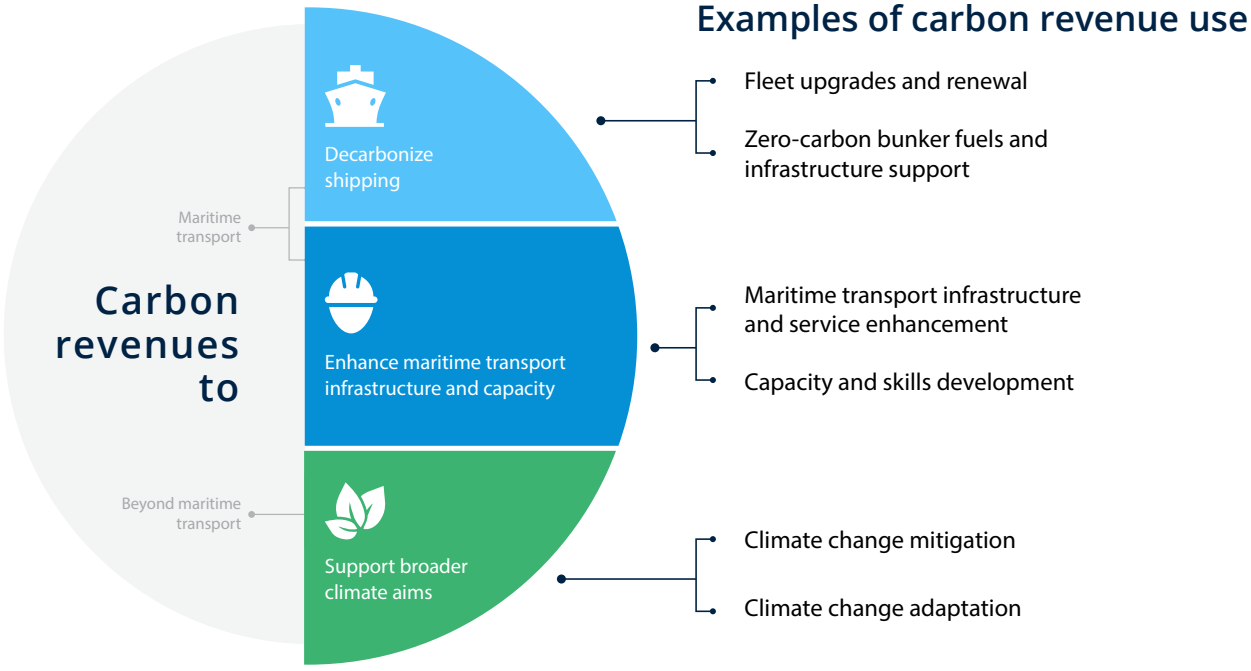
Figure 2.1: Carbon revenue use options



Source: World Bank

Of the three use options identified as most aligned with the Initial IMO GHG Strategy, selected principles, and desirable features, two relate directly to maritime transport. These two options are *decarbonizing shipping* and *enhancing maritime transport infrastructure and capacity.* The third aligned use option is *supporting broader climate aims,* which can refer to spending beyond maritime transport.

Figure 2.2: Key carbon revenue use options and examples



Source: World Bank

Table 2.1 provides possible examples for each of these revenue use options. For instance, *decarbonizing shipping* encompasses a wide range of possible revenue uses, including vessel-related investments (for example, in zero-carbon engines or energy efficiency technologies), land-based investments (such as in the production and distribution of zero-carbon bunker fuels[5]), and research and development (for instance, in zero-carbon technologies). The other maritime transport-related use option is *enhancing maritime transport infrastructure and capacity.* This encompasses climate-related investments, such as enhancing ports' resilience to sea level rise or training seafarers to use zero-carbon fuels and technologies, but also non-strictly climate-related investments in maritime transport, such as throughput efficiency, digitalization, and port-hinterland interface improvements. The revenue use option *supporting broader climate aims* encompasses climate-related investments partially or fully unrelated to maritime transport. Such investments could, for example, strengthen countries' capacity to adapt to climate change by reducing flooding, draught, or coastal erosion risks, or increase their overall ability to mitigate climate change by financing the production of renewable energy for non-shipping use or the preservation or expansion of carbon sinks (such as forests, wetlands).

Table 2.1: Key carbon revenue use options and specific examples

Carbon revenues to	Examples
Decarbonize shipping	**Fleet upgrades and renewal:** zero-carbon engines and propulsion systems; on-board energy efficiency technologies; research and development
	Zero-carbon bunker fuels and infrastructure support: fuel production (including upstream renewable energy), storage, distribution, and use; shore power connection; research and development
Enhance maritime transport infrastructure and capacity	**Maritime transport infrastructure and services enhancement:** port upgrades, adaptation, and digitalization; trade and transport facilitation; port-hinterland interface improvements
	Capacity and skills development: technical cooperation and capacity-building programs; education and training programs
Support broader climate aims	**Climate change mitigation:** renewable power generation, storage, and distribution for non-shipping use; carbon sinks
	Climate change adaptation: resilience and protection against extreme weather events, coastal erosion, sea level rise, and agricultural damage; adaptation of agriculture and food systems; development of early warning and disaster response systems

Source: World Bank

Previous World Bank research analyzed the potential for different carbon revenue use options to address DNI. Box 2.1 discusses the potential to address DNI by spending carbon revenues on *decarbonizing shipping, enhancing maritime transport infrastructure and capacity,* and *supporting broader climate aims.*

[5] These are alternative marine fuels, which result in very low, and ultimately zero, GHGs across their entire lifecycle - from production to distribution and combustion. See Englert et al. (2021)

Box 2.1 Addressing disproportionately negative impacts on States

Although the term "equitable transition" has not yet been defined, there is a general understanding that it includes the need to address DNI on States, as appropriate. The Initial IMO GHG Strategy requires that the impacts of IMO climate policy measures on States be assessed and taken into account before they are adopted (IMO 2018). They could include impacts on transport dependency and costs, food security, and socio-economic progress and development. The Initial IMO GHG Strategy further states that "disproportionately negative impacts should be assessed and addressed, as appropriate" (IMO 2018).

In line with this requirement, a comprehensive impact assessment of a combined IMO short-term measure was conducted. It revealed that the aggregate global impacts of the measure on maritime logistics costs could be considered small relative to the typical market variability of freight rates UNCTAD (2021). Compared to the longer-term impact of other disruptions (for example, pandemics, climate change factors), the global impact on gross domestic product (GDP) and trade flows could also be considered small. However, UNCTAD (2021) also found that developing coastal countries, including SIDS and LDCs would experience a bigger decline in their GDP, import, and export flows compared to developed coastal countries, while landlocked countries could expect a relatively lower negative impact. Considering the resource constraints of some developing countries, including SIDS and LDCs, UNCTAD (2021a) expects that some countries would likely require support to mitigate increased maritime costs and to alleviate consequent negative impacts on their real income and trade flows.

Unrelated to the IMO negotiations, UNCTAD (2021b) has also simulated the impact of the recent surge in container freight rates and found that SIDS will experience the highest and landlocked developing countries (LLDCs) the lowest percentage of import and consumer price increases.

There are two main methods to address DNI through carbon revenue use:

1. Carbon revenues could be used to avoid DNI before it occurs. Maritime transport-related spending is well-suited to avoiding DNI, at least partially. Using carbon revenues on *decarbonizing shipping* can help achieve GHG mitigation targets with less stringent policies. This, in turn, can reduce negative impacts on States (Dominioni et al. 2022). *Enhancing maritime transport infrastructure and capacity* can also help reduce the negative impacts of shipping's decarbonization on countries. For instance, increasing port efficiency can reduce transport costs and therefore, offset at least some of the increase in transport costs due to the implementation of climate policies for international shipping (EC DG CLIMA 2021). Similarly, improving port-hinterland distribution systems could decrease transport costs in global shipping networks, given that port-hinterland transport costs are currently the most significant cost factor in global freight transport chains (Halim, Kwakkel, and Tavasszy 2016).

2. Carbon revenues can be channeled to countries affected by DNI without avoiding DNI directly. This approach could be used in conjunction with spending to avoid DNI; for instance, if avoiding some DNI is impossible or too expensive. All three carbon revenues use options most aligned with the Initial IMO GHG Strategy, selected principles, and desirable features, can, in principle, help remedy DNI—without avoiding DNI directly—if recipients of carbon revenues are countries affected by DNI (Dominioni et al. 2022).

3

Spending carbon revenues on maritime transport and beyond

Chapter 3 analyzes whether using carbon revenues exclusively for maritime transport-related spending is likely to maximize climate outcomes and support an equitable transition. This chapter explains how key carbon revenue use options can contribute to achieving this twin goal.

03
Spending carbon revenues on maritime transport and beyond

This chapter discusses whether using carbon revenues exclusively to finance projects and programs related to maritime transport is likely to achieve two important objectives: maximizing climate outcomes and supporting an equitable transition. Maximizing climate outcomes (achieving the greatest possible GHG reductions and climate adaptation benefits for the available carbon revenues) is important because current climate finance flows are critically insufficient to meet developing countries' needs (Climate Policy Initiative 2021; IPCC 2022a; World Bank 2020). There is, therefore, a strong case to ensure that new sources of climate finance are channeled to areas where they can deliver the greatest climate outcomes and help close the financing gap. At the same time, many shipping stakeholders have called for an equitable energy transition of international shipping and the Initial IMO GHG Strategy includes guiding principles related to equity (chapter 2 and section 3.2). On this basis, this chapter considers whether using carbon revenues exclusively to finance projects and programs related to maritime transport is likely to maximize climate outcomes and support an equitable transition.

The analysis focuses on the three carbon revenue use options identified in chapter 2 as most aligned with the Initial IMO GHG Strategy, selected principles, and desirable features. It considers whether spending carbon revenues exclusively on *decarbonizing shipping* and *enhancing maritime transport infrastructure and capacity* is likely to yield maximum climate outcomes and at the same time, support an equitable transition compared to the alternative of spending a share of these carbon revenues on *supporting broader climate aims* too. Section 3.1 analyses whether spending carbon revenues exclusively on maritime transport is likely to achieve maximum climate outcomes. Section 3.2 complements this analysis by focusing on whether spending carbon revenues only on maritime transport projects and programs will also support an equitable transition.

Several trillions of dollars will be needed to decarbonize shipping in line with the Paris Agreement temperature targets. Carbon revenues can cover some of these investments.

> There is a call that the decarbonization of international shipping should embrace an equitable transition that leaves no country behind.

3.1 Maximizing climate outcomes

Significant investments are needed to decarbonize maritime transport. Krantz, Søgaard, and Smith (2020) estimate that capital investments of between $1 trillion and $1.9 trillion will be needed between 2030 and 2050 to reduce GHG emissions by 50 percent or 100 percent by 2050. These estimates assume that ammonia will be the primary zero-carbon fuel choice. The scale of investments depends not only on the decarbonization trajectory but also on the production method used to produce ammonia. Approximately 87 percent of the total investments are needed for land-based infrastructure and production facilities for low-carbon fuels (half of which would go toward hydrogen production and the other half toward ammonia synthesis, storage, and distribution). The remaining 13 percent of the estimated investment needs relate to ships and include, for example, the machinery and onboard storage for ships to run on ammonia, and energy efficiency technologies. While these estimates for hydrogen production, ammonia synthesis, bunkering infrastructure, and ship enhancements are already significant on their own, additional investments in renewable power generation will be needed to provide the necessary energy to produce zero-carbon bunker fuels. Horton et al. (2022) investigate the emissions and additional cost impacts of three different fuel and technology pathways characterized as:

- early pursuit of green ammonia and hydrogen
- replacement of fossil fuels with drop-in liquid and gaseous biofuels
- maximum uptake of energy efficiency technologies, carbon capture onboard vessels, and the gradual increase of green ammonia and methanol

The three pathways are projected to reduce well-to-wake GHG emissions from international shipping by over 70 percent to 100 percent by 2050, relative to 2008. Compared to the baseline scenario, implementing the three pathways is projected to result in extra costs of approximately $235 billion, $489 billion, and $181 billion, respectively, spanning 2020 to 2050. This includes vessel capital costs, fuel costs, and other operating costs.

Carbon revenues from international shipping can cover some of these investments and help catalyze additional resources, lower abatement costs, and accelerate GHG emissions reductions in the sector. Carbon revenues can finance part of the investments needed and help mobilize further financial resources from the private and public sectors (Climate Policy Initiative 2021; World Bank 2020; UNCTAD 2014a). Thereby, they can unlock the large-scale investments needed to decarbonize shipping. Combining a carbon price on fossil-based bunker fuels with public financial support for zero-carbon bunker fuels and technologies can help address some of the prevalent market barriers and failures that hinder the energy transition. These relate, for instance, to the traditional chicken-and-egg dilemma where ship owners, on the one hand, may make investments in zero-carbon vessels only when the adequate infrastructure for zero-carbon bunker fuels is in place, and ports, on the other hand, may only want to invest in such infrastructure once the demand for these fuels can be credibly demonstrated. Public sector financing can support the development of such infrastructure and reduce risks for first movers (World Bank 2019). If such market failures and barriers are addressed, less stringent policies may be needed to reduce GHG emissions. This can translate to lower overall decarbonization costs.

Strategic spending of carbon revenues on decarbonizing shipping can also help achieve crucial tipping points in the production, distribution, and deployment of zero-carbon bunker fuels. Reaching these tipping points is likely to require, among other things, narrowing or closing the price gap between zero-carbon bunker fuels and heavy fuel oil (HFO), building bunkering infrastructure for zero-carbon bunker fuels, enabling shipyards to build vessels that run on zero-carbon bunker fuels, and making improvements to zero-carbon bunker-fuel engines (Meldrum et al. 2023). Therefore, investing in zero-carbon bunker fuels and technologies represents—next to maximizing energy efficiency—the key spending option to support international shipping's transition to absolute zero GHG emissions.

Using carbon revenues to support the decarbonization of international shipping is likely to garner further industry support. Earmarking carbon revenues can increase the political acceptability of carbon pricing among concerned stakeholders (World Bank 2019). Similarly, spending carbon revenues on decarbonizing shipping can help garner industry support. Eventually, this greater support can enable the implementation of a more ambitious carbon pricing instrument and accelerate the decarbonization process of the sector.

However, spending carbon revenues beyond maritime transport is likely to yield even more significant climate outcomes than if their use was restricted to maritime transport only. Using carbon revenues for maritime transport-related spending may not produce the highest possible climate benefits as some of the most cost-effective options to fight climate change are likely to be unconnected to maritime transport. This relates to potential investments in climate change mitigation and adaptation.

Using carbon revenues beyond maritime transport can also deliver synergies with shipping's decarbonization and vice-versa. Spending carbon revenues beyond maritime transport can also help decarbonize international shipping. For instance, recent research shows that achieving tipping points in the production of green ammonia as a critical feedstock for the fertilizer industry can unlock significant decarbonization opportunities to the benefit of the shipping sector (Grüning, König, and Menzel 2021). Positive spillover effects can also be expected in the other direction, meaning that investments in shipping's decarbonization can also help other sectors decarbonize. Investments in zero-carbon bunker fuel production, for example are likely to create economies of scale in the production of zero-carbon fuels for other sectors (Ash and Carpenter-Lomax 2020; Carpenter-Lomax et al. 2021). There are, therefore, potential win-win situations for the shipping sector and other sectors in using carbon revenues on projects and programs related to maritime transport and beyond.

3.2 Supporting an equitable transition

Many recent submissions and interventions at ISWG-GHG 14, MEPC 79, and earlier meetings support the view that the decarbonization of international shipping should be just and/or equitable. Recent submissions and negotiations at MEPC and ISWG-GHG have often referred to the need to achieve a just and/or equitable transition in international shipping, with many also advocating in favor of leaving no state behind.[6]

In this context, this section analyzes whether spending carbon revenues from shipping exclusively on maritime transport-related projects and programs will also support an equitable transition. In particular, the analysis focuses on whether using carbon revenues to finance maritime transport-related projects or programs always provides sufficient spending opportunities in developing countries, especially in those that:

- have contributed less to climate change
- have less capacity to address climate change
- are more likely to be subject to DNIs

Table 2.1 identified different examples of funding activities that could fall under the revenue use options for decarbonizing shipping and enhancing maritime transport infrastructure and capacity. These are primarily fleet upgrades and renewal; zero-carbon bunker fuels and infrastructure support; maritime transport infrastructure and services enhancement; and capacity and skills development. The following sections will examine to what extent these investment opportunities would be available in SIDS, LDCs, and other developing countries.

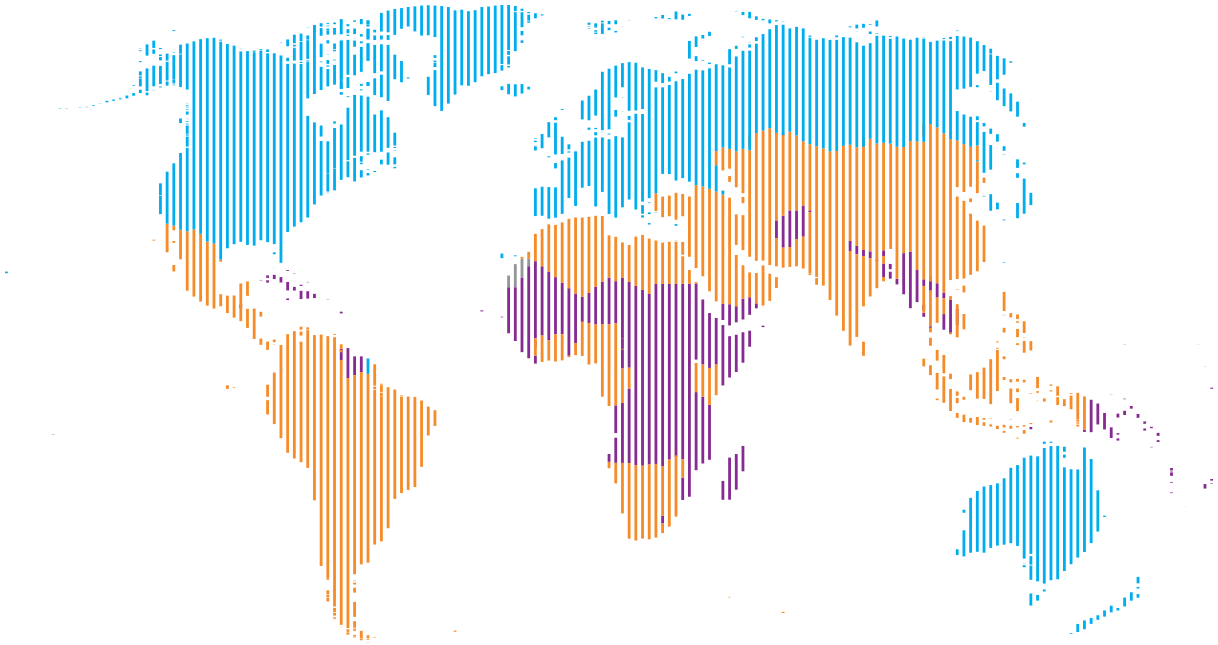
3.2.1 Fleet upgrades and renewal

Financing fleet upgrades and renewal is likely to provide significant investment opportunities in some developing countries. Developing countries account for a significant proportion of the global merchant fleet in terms of ownership[7] and flag of registration and have a high shipbuilding capacity. Developing countries make up 78.5 percent of the global merchant fleet by flag of registration of vessels of 1,000 gross tonnage (GT) and above, and 38.9 percent of the global merchant fleet by ownership of vessels of 100 GT and above (UNCTADstat 2022a; UNCTADstat 2022b). They also built 46.8 percent of merchant ships of 100 GT and above in 2021, though China accounted for the vast majority of this at 44.2 percent (UNCTADstat 2022c). Therefore, financing fleet upgrades and renewal could provide considerable investment opportunities in some developing countries.

[6] For an overview of the terms used, see Fiji et al. (2023).

[7] The country of beneficial ownership refers to the country in which the company with the main commercial responsibility for the vessel is located (UNCTADstat 2022a).The figures reported in this text represent the percentage of the total fleet as measured in dead weight tons (UNCTADstat 2022a). In principle, the country of beneficial ownership could provide a proxy for potential investments into a country's fleet. However, as discussed in Dominioni (2022), the ownership structure of a vessel is often blurred across multiple investment vehicles and jurisdictions. Hence, if carbon revenues were distributed to shipping companies directly, the country of ownership would be an imperfect metric. Distributing carbon revenues to governments would circumvent this issue.

Figure 3.1: Global share of flag registration, vessel ownership and shipbuilding volume by country group



	Developed economies	Developing economies excl. SIDS and LDCs	SIDS and LDCs
Flag registration	21%	38%	41%
Vessel ownership	60%	32%	10%
Shipbuilding volume	53%	47%	0%

Source: based on World Bank data and UNCTADstat (2022a; 2022b; 2022c)

However, spending opportunities are likely to be limited in some SIDS and LDCs. Financing fleet upgrades and renewal does not provide many spending opportunities in countries that have small merchant fleets in terms of ownership or flag of registration, or low shipbuilding capacity. This is the case for many SIDS and LDCs. Regarding flag of registration, SIDS and LDCs collectively account for approximately 41 percent of the global merchant fleet of vessels of 100 GT and above (UNCTADstat 2022b).[8] However, just four countries[9] account for approximately 37 percent of the global merchant fleet, while 60 countries collectively make up less than 1 percent. In terms of vessel ownership, SIDS and LDCs collectively account for approximately 10 percent of the global merchant fleet of vessels of 1,000 gross tons (GT) and above.[10] However, Singapore (≈6 percent) and Bermuda (≈3 percent) account for around 9 percent, while 63 countries collectively make up the remaining 1 percent (UNCTADstat 2022a). Finally, regarding shipbuilding volume, UNCTADstat only provides data for six SIDS and LDCs, and only Bangladesh and Singapore show a figure just above 0. For these reasons, many SIDS and LDCs would have limited, or possibly no, large-scale investment opportunities for fleet upgrades and renewal.

[8] SIDS account for 25 percent and LDCs for 16 percent. The combined figure accounts for the fact that some countries are both SIDS and LDCs.

[9] Liberia (15 percent), Marshall Islands (13 percent), Singapore (6 percent), Bahamas (3 percent)

[10] SIDS account for approximately 9 percent and LDCs for 1 percent.

Opportunities for spending carbon revenues on fleet upgrades and renewal are likely to be limited in many other developing countries as well. For example, 46 developing countries (excluding SIDS and LDCs) collectively account for less than 1 percent of the fleet in terms of registration (UNCTADstat 2022b). Similarly, for ownership, 39 developing countries (excluding SIDS and LDCs) collectively make up less than 1 percent of the global fleet (UNCTADstat 2022b). For shipbuilding, of the 26 developing countries (excluding SIDS and LDCs) for which UNCTADstat provides data, only two account for more than 1 percent while 23 collectively account for less than 1 percent of ships built in 2021 (UNCTADstat 2022c). This pattern also holds for LLDCs, which collectively account for only 0.1 percent of the global merchant fleet in terms of flag registration and ownership and even less for shipbuilding volume (UNCTADstat 2022a; 2022b; 2022c).

3.2.2 Zero-carbon bunker fuels and infrastructure support

Many developing countries have significant potential to supply zero-carbon bunker fuels. Recent World Bank analysis examined the zero-carbon bunker fuel production potential in 218 countries under three scenarios relating to the production of blue/green hydrogen and ammonia (Englert et al. 2021).[11] Across the three scenarios, low- and middle-income countries accounted for between 29 percent and 41 percent of the countries identified as having high potential to produce zero-carbon bunker fuels. High-level analyses of Brazil, India, Mauritius, and Malaysia found the four countries could together supply between 13 percent and 47 percent of the global demand for ammonia by 2050 (Englert et al. 2021).[12] This shows that there are significant investment opportunities in developing countries well-positioned to supply zero-carbon bunker fuels. Such investments are also likely to catalyze further development opportunities, such as creating economies of scale to produce zero-carbon fuels for other sectors (Ash and Carpenter-Lomax 2020; Carpenter-Lomax et al. 2021).

However, there is a risk that some countries may not fully qualify to receive carbon revenues if they were primarily used to support the production and distribution of zero-carbon fuels. Among those categorized as having a high potential to produce *some* type of zero-carbon bunker fuel, less than five countries were SIDS or LDCs. Depending on the scenario, between 0 and 16 SIDS and LDCs have been categorized as having "promising potential," and between 21 and 77 have been categorized as having "limited potential or insufficient data." While the lack of data is likely to have prevented the identification of potential investment opportunities in several countries, the overall analysis still suggests that certain SIDS and LDCs may not necessarily count among the first movers for zero-carbon bunker fuel production.

[11] Blue hydrogen/ammonia refers to hydrogen/ammonia produced using natural gas with carbon capture and storage, green hydrogen/ammonia refers to hydrogen/ammonia produced using renewable energy sources (Englert et al. 2021).

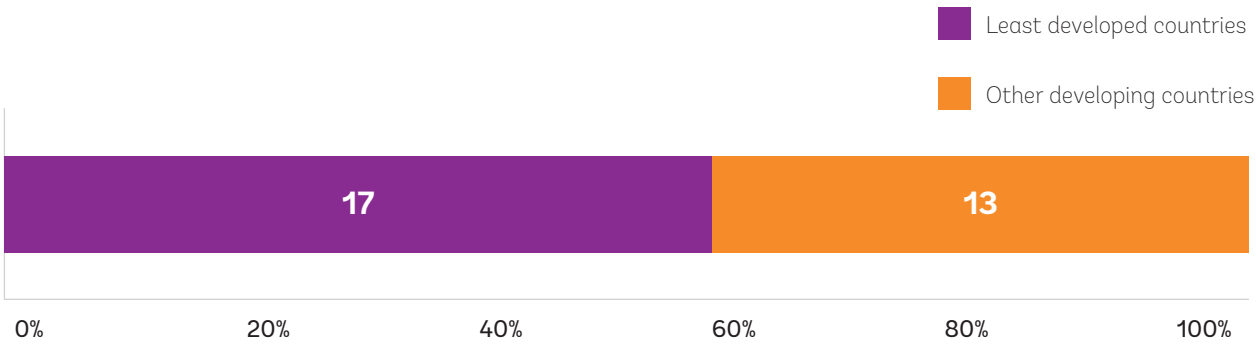
[12] Brazil accounted for 2 percent to 9 percent; India for 10 percent to 27 percent; Mauritius for 0.3 percent to 0.5 percent; and Malaysia for 1 percent to 10 percent.

3.2.3 Maritime transport infrastructure and services enhancement

Some developing countries, including some LDCs, appear to have limited—if any—opportunities to make significant investments in enhancing maritime transport infrastructure and services. A clear case in point is LLDCs, as they do not have direct access to the sea and are sometimes located far from any coast. Note that more than one-third of LDCs (17 out of 46) are also LLDCs. Restricting carbon revenue use to maritime transport-related spending could severely limit opportunities to use carbon revenues in these countries, challenging the goal of supporting an equitable transition.

Certain developing countries would also be disadvantaged if they could only access carbon revenues for maritime transport-related spending. Figure 3.2 illustrates that the considerations related to LLDCs do not only apply to LDCs, but also to several developing countries. Therefore, these developing countries are likely to struggle to access carbon revenues if their use were restricted to maritime transport-related spending.

Figure 3.2: Landlocked developing countries and their development status[13]



Source: UNCTADstat (2023)

LLDCs are likely to be disadvantaged by maritime transport-related spending, even if this is broadly interpreted to include hinterland infrastructure. In principle, maritime transport infrastructure could include hinterland infrastructure that connects LLDCs to seaports in neighboring countries. Research indicates that such investments can reduce transport costs for LLDCs and, thereby, unlock untapped development opportunities (UNCTAD 2013; UN ESCAP 2020). There is a potential avenue for using carbon revenues on maritime transport infrastructure to benefit LLDCs. However, these countries are still likely to be disadvantaged compared to coastal states. For instance, a significant portion of the investment would be used for infrastructure in neighboring countries. The actual trade benefits of these investments may also be subject to cooperation efforts undertaken by the neighboring country. While, ultimately, LLDCs need to assess whether such potential investments in neighboring countries are of interest, there is an argument that LLDCs may not necessarily have the same level of control and decision-making power over carbon revenues under this use option, compared to coastal states.

[13] Two LLDCs were omitted from this figure as these countries are classified as developed economies: the Republic of Moldova and North Macedonia.

Even in some coastal states, there may be limited opportunities for port infrastructure enhancements. In practice, there is great variation among coastal countries in terms of the number of ports and port capacity. While some developing countries have many ports, some of significant size, many others—including some SIDS and LDCs—are home to less than five or even only one port, with many of these ports being small (Marine Vessel Traffic 2023). In that context, carbon revenues from shipping could be used to improve their port infrastructure and increase port efficiency, effectiveness, and performance. For instance, port infrastructure in many SIDS could benefit from improvements in dock loadings, additional storage and warehousing space, and separation of cargo and passenger service facilities (Adeoti et al. 2020; UNCTAD 2014b)[14], or also from risk-mitigating climate change adaptation measures (Van Houtven et al. 2022). Existing literature (Clark, Dollar, and Micco 2004; Micco and Perez 2002; Wilmsmeier, Hoffmann, and Sanchez 2006) indicates that improving port infrastructure and performance can lower maritime transport costs. As SIDS and LDCs face higher transport costs than the world average (Rojon et al. 2021; UNCTAD 2017) and because these could increase further from the introduction of additional IMO climate policy measures (Rojon et al. 2021), the investments could help address the potential DNIs of such measures. New ports could also be financed in these countries if there is a viable business and development case for doing so. However, even accounting for such investments, opportunities to upgrade existing maritime transport infrastructure can appear limited in these countries compared to countries with much larger port—and maritime transport-related—infrastructure.

3.2.4 Capacity and skills development

Opportunities to invest in the upskilling of the maritime workforce can be limited in some countries, including in many SIDS and LDCs. For the decarbonization of the shipping sector to be safe and successful, a considerable level of training and upskilling will be required for the maritime workforce (Kaspersen et al. 2022; Maritime Just Transition Task Force 2022). Carbon revenues could be used to finance these training and upskilling measures to support the decarbonization of shipping; however, opportunities for countries to do so are currently unevenly distributed. According to UNCTAD data, seven countries provide almost 52 percent of the global maritime workforce (UNCTADstat 2022d). SIDS and LDCs combined currently supply about 8 percent. Individually, many of these countries supply less than 0.02 percent. This suggests that there are very few opportunities to invest in the upskilling of the existing maritime workforce in these countries. Yet, there may be opportunities for countries to build up or expand their maritime workforce. The maritime workforce encompasses a wide range of occupations (for example, stevedores or crane operators) as opposed to seafaring alone. However, these port-related occupations depend on the existence of domestic port infrastructure. Therefore, related investment opportunities would still be limited in many countries.

[14] For a recent analysis on natural hazards for global port infrastructure and related trade losses, see Verschuur et al. (2023)

3.2.5 Broader climate aims: mitigation and adaptation

Supporting broader climate aims could unlock significant investment opportunities in developing countries—including SIDS, LDCs, and LLDCs. Allowing carbon revenues to be used to support climate change mitigation and adaptation projects or programs can unlock substantial investment opportunities in countries that do not have significant spending options related to maritime transport.

There are plenty of opportunities to financially support climate change mitigation in many developing countries, including SIDS and LDCs. Many of these countries have ample investment opportunities in climate change mitigation solutions, such as in renewable energy (beyond the production of zero-carbon bunker fuels) (IPCC 2022a; UNCTAD 2017b), agriculture (Roe et al. 2021), or nature-based solutions like carbon sinks (Bertram et al. 2021; Roe et al. 2021). For instance, the Intergovernmental Panel on Climate Change (IPCC) (2022a) has highlighted the need for investments in low-income countries in Africa—which often have significant renewable energy potential—to prevent them from locking-in fossil fuel infrastructure and emitting large volumes of GHG as they develop. Thus, broadening carbon revenue use options could allow for large-scale mitigation actions in these countries and support their development into low- and zero-carbon economies.

Similarly, there are significant spending opportunities in climate change adaptation that do not relate to maritime transport. Investment opportunities related to climate adaptation vary across countries and are unlikely to refer exclusively to maritime transport spending. Key areas requiring investments for adaptation include improving the resilience of infrastructure, agricultural methods, water use and management, health systems, and coastal defenses (Global Commission on Adaptation 2022; IPCC 2022b). The loss of marine, coastal, and terrestrial biodiversity and ecosystem services, the destruction of settlements and infrastructure, and economic decline have been identified as major climate risks (IPCC 2022b). Enhancing maritime transport infrastructure may help mitigate some of these risks but considering a wider range of interventions could deliver more urgently needed adaptation benefits in many of these countries.

3.3 Conclusion

While there is a strong case to use a significant share of carbon revenues to decarbonize shipping, using a share to support broader climate aims could help achieve maximum climate outcomes. Using carbon revenues on decarbonizing shipping can clearly help narrow the gap between the price of fossil-based bunker fuels and zero-carbon bunker fuels, expediting crucial tipping points in the deployment of the latter. However, using a share of carbon revenues to support climate action more broadly can deliver greater climate outcomes overall, as the most cost-effective spending opportunities on climate change mitigation and adaptation are not all likely to be confined to maritime transport.

Using carbon revenues exclusively for maritime transport-related spending is likely to limit some countries' ability to take full advantage of these carbon revenues. This may apply particularly to countries that have contributed less to climate change, have less capacity to address it, or are more likely to be subject to DNIs. Here, data indicates that spending opportunities on fleet upgrades and renewal, zero-carbon bunker fuels and infrastructure support, maritime transport infrastructure and services enhancement, and capacity and skills development appear limited in some developing countries, particularly in SIDS, LDCs, and LLDCs. Thus, using a share of carbon revenues to go beyond exclusive maritime transport-related spending to finance broader climate aims in these countries—both in terms of mitigation and adaptation—could help support an equitable transition.

4

Prioritizing carbon revenue recipients

Chapter 4 discusses which countries could receive carbon revenues from international shipping and how prioritizing recipients could contribute to an effective and equitable energy transition of the sector.

04
Prioritizing carbon revenue recipients

This chapter discusses which groups of country governments could be recipients of potential carbon revenues from international shipping. The focus is on governments because addressing equity considerations can be more easily achieved when a significant share of carbon revenues is distributed to governments (Dominioni et al. 2022). That is because the relationship between a company and a particular country often remains blurred. This can especially be the case in the international shipping sector, where vessel ownership, the ship's registered flag, trading routes covered, and chartering arrangements may indicate a relationship between a vessel and multiple countries (Dominioni et al. 2022). It is, therefore, easier to control and keep track of the flow of carbon revenues to countries, in which case governments would be the main recipients. Targeting governments as recipients can also help maximize climate outcomes, for instance, by supporting green public sector investments (IFC 2011).

While the following discussion focuses on governments, there is also an argument that a share of carbon revenues could be distributed to the private sector. A valid case could exist if this helped achieve maximum climate outcomes (Dominioni et al. 2022). In that context, the private sector could potentially access carbon revenues either directly (through a feebate scheme or a fund with direct access) or indirectly (through governments as intermediaries).

4.1 Developing countries as primary recipients

Governments of developing countries could be the primary recipients of carbon revenues from international shipping. Usually, international public climate finance is directed toward developing countries or a selection thereof. There are various reasons to channel international public climate finance—including carbon revenues from shipping—primarily to developing countries. For instance, equity-related considerations call for spending carbon revenues from shipping primarily in developing countries, as they tend to be more exposed to climate risks, have less capacity to address these risks, and have historically contributed less to climate change than many developed countries. In addition, as discussed in chapter 3, there is a large gap between the current climate finance flows and the need for investments in climate change adaptation and mitigation in many developing countries. The higher cost of capital for low-carbon investments[15] in many developing countries can discourage climate-related investments, even in areas that are most in need. Using carbon revenues in developing countries can help address these issues by making additional resources directly available and catalyzing additional public and private investments.

The distribution of carbon revenues to countries should consider the need to maximize climate outcomes and address equity concerns. Various documents submitted to IMO meetings (for example, Argentina et al. 2022; Austria et al. 2022; ICS 2022; Japan 2021; Marshall Island and Solomon Islands 2021; Norway 2022) consider that potential carbon revenues from international shipping would be either wholly or partially[16] distributed by a novel fund. If this was the case, the actual distribution of carbon revenues to individual countries would depend on the specific selection criteria adopted by the fund for project or program proposals. Selection criteria currently adopted by the major climate funds aim to balance the need to achieve maximum climate outcomes with an equitable distribution of climate finance (Dominioni et al. 2022). For instance, the distribution of climate finance often accounts for the climate change mitigation or adaptation impact of potential investments, their cost-effectiveness, and the recipients' vulnerability to climate change. Developing countries can often score highly in these criteria.

[15] The cost of capital tends to be higher in many developing countries due to underdeveloped financial markets and other local factors—such as more uncertain policy frameworks and lower business confidence (Ameli et al. 2021)

[16] Partial distribution would imply also taking advantage of passive revenue use such as through a feebate scheme.

4.2 Additional support for selected developing countries like SIDS and LDCs

Experience from climate finance suggests that the adoption of selection criteria that aim to achieve an equitable distribution of climate finance is often insufficient to guarantee equitable access to climate finance. This is especially true for the most climate-vulnerable countries such as SIDS and LDCs. Many of these countries have limited human resources and technical expertise. This can significantly constrain their ability to develop and implement project or program proposals that are likely to succeed in bids (IEU 2020; IEU 2022; OECD 2022; UN-OHRLLS 2022). Furthermore, some developing countries, including many SIDS and LDCs, face difficulties regarding accessing, generating, and analyzing climate data (Gallagher 2021; IEU 2020; IEU 2022; UN-OHRLLS 2022). Insufficient data can be a major barrier to accessing climate finance when it is required to prove the "climate rationale" of potential projects.

To level the playing field, it is common practice among climate funds to include an allocation floor for countries facing greater barriers to access climate finance. Allocation floors guarantee a share or absolute amount of funding for the selected countries. This is to reduce the competition between these disadvantaged countries and countries that do not face similar barriers to accessing climate finance (Polycarp et al. 2013).

Allocation floors can also ensure that climate finance is directed toward countries that are most vulnerable to climate change. For instance, the Green Climate Fund (GCF) has a target to distribute 50 percent of its funding to climate change adaptation, and 50 percent of this adaptation funding is reserved for countries particularly vulnerable to climate change, including SIDS, LDCs, and African countries (GCF 2022).

Consequently, a share of carbon revenues from international shipping could be reserved for a group of countries that face greater barriers to accessing climate finance or are more vulnerable to climate change. This group or these groups of countries should include SIDS and LDCs who often have difficulties accessing climate finance or are particularly vulnerable to climate change. Experience with and lessons learned from existing funds can provide valuable guidance on which countries face persistent obstacles in gaining access to the available climate finance.

In addition, to avoid concentrated spending in a few specific countries, some climate funds also adopt funding ceilings for individual countries. Funding ceilings fix a maximum amount of funding that each country can receive (expressed in percentage or absolute amount) over a defined funding cycle. Funding ceilings have become a feature of a number of major climate funds (IEU 2022). The Adaptation Fund, for example, has a ceiling of $20 million per country (Adaptation Fund 2022).

4.3 Developed countries as complementary recipients

To support international shipping's rapid decarbonization, there may also be a case to allow developed countries to access some of the carbon revenues. While the above discussion has noted a case for making developing countries, SIDS, and LDCs the primary recipients of carbon revenues from international shipping, there could be some merit in granting developed countries access to some of these carbon revenues. For example, carbon revenues could encourage shipping's decarbonization by supporting fleet upgrades and renewal and accelerating the production, distribution, and deployment of zero-carbon bunker fuels and technologies in SIDS, LDCs, other developing countries, and developed countries.

Allowing developed countries to bid for funding for shipping decarbonization activities could potentially narrow the competitiveness gap between zero-carbon and conventional fossil-based bunker fuels and reach tipping points faster than if zero-carbon bunker fuels were supported only in developing countries, SIDS, and LDCs. By making the necessary infrastructure available globally, fuel costs and associated trade cost increases could be minimized. In addition, the early adoption of zero-carbon bunker fuels and technologies in the initial phase of shipping's energy transition will be important to reduce technological uncertainty, create markets for fuel and technology providers, and encourage further investments (Mäkitie et al. 2022).

Supporting all countries in shipping's decarbonization—especially in the initial phase—can create positive feedback loopholes. Not only could such widespread support reduce barriers to further fuel and technology uptake, it is also generally associated with cost reductions (IPCC 2022a; Mäkitie et al. 2022). Related to the transition to a more sustainable energy system, IPCC (2022a) finds that "cost reductions facilitate adoption, which generates opportunities for further cost reductions through a process of learning by doing". This points to the possibility of positive feedback loops, which can result in economies of scale, driving down the costs of zero-carbon energy, fuels, and technologies. If such effects can be induced in the initial phases of shipping's energy transition, they can lower the costs of the decarbonization trajectory, and thereby, reduce unintended impacts on transport and trade costs.

Allowing all countries to access carbon revenues could help ensure that zero-carbon bunker fuels are available worldwide. Due to the indivisible nature of seaborne trade between developed and developing countries, the availability of zero-carbon bunker fuels must be ensured globally to enable international shipping to decarbonize fully and rapidly. The development of the relevant infrastructure on a global level could be supported by allowing all countries to bid for carbon revenues to decarbonize shipping.

Different financing terms could be applied for developed and developing countries. If some carbon revenues were made available to developed countries to support and accelerate the decarbonization of international shipping, equity concerns could be addressed to a certain extent by applying different financing terms for developed and developing countries. Such options to differentiate financing terms are further discussed in section 5.1.3.

4.4 Conclusion

While all countries may be recipients of carbon revenues, there is a strong case to make developing countries the primary recipients and provide special support to selected developing countries like SIDS and LDCs. Given the frequently reported constraints of many SIDS and LDCs to develop and implement competitive funding proposals, these groups of countries and other developing countries that face similar barriers or are particularly vulnerable to climate change would significantly benefit from a certain degree of shielding against competition with other countries, such as in the form of a reserved share of carbon revenues. Considering developed countries as complementary recipients of carbon revenues could help accelerate international shipping's decarbonization at the fastest speed possible given the urgency of the climate crisis and the imperative to fully phase out the sector's GHG emissions as quickly as possible.

5

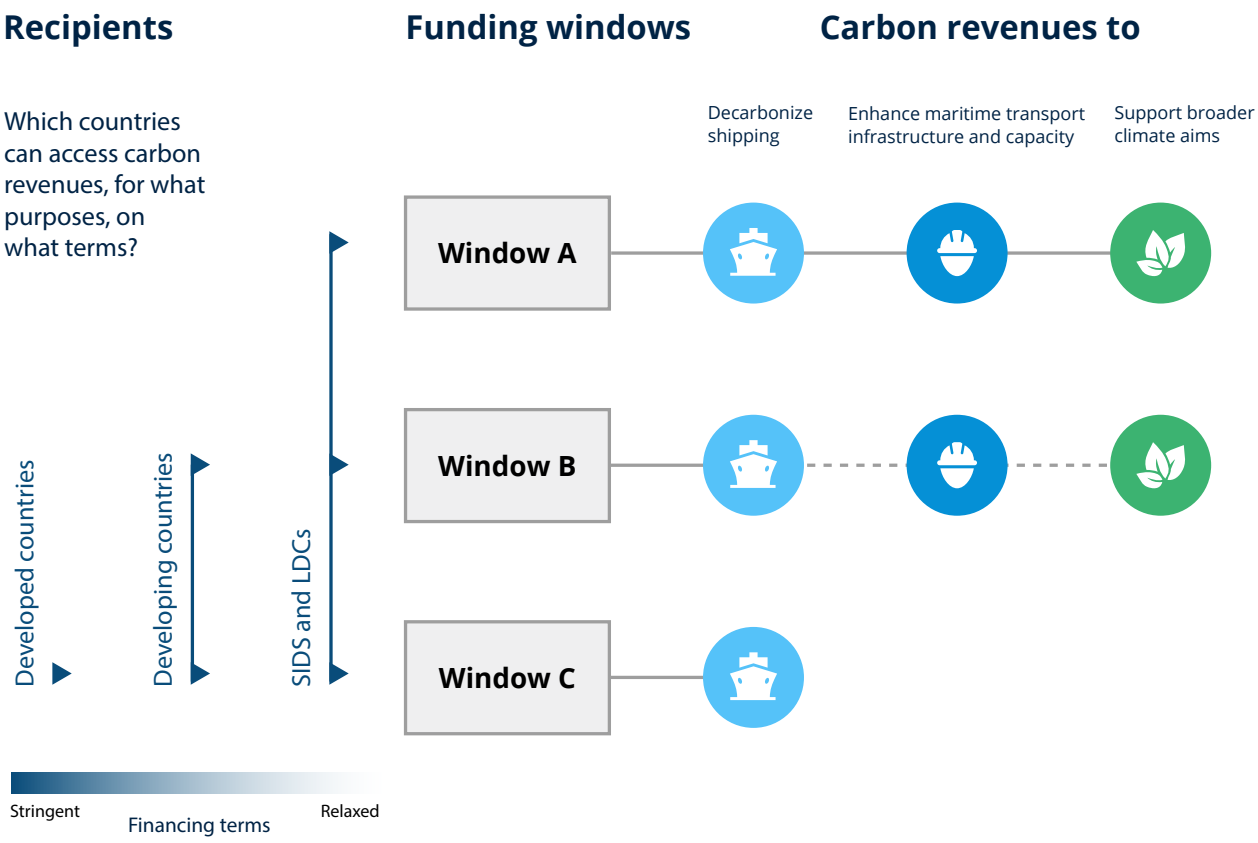
Developing a distribution framework

Chapter 5 outlines a possible distribution framework for carbon revenues from international shipping. This framework aims to achieve maximum climate outcomes and support an equitable transition.

05
Developing a distribution framework

This chapter builds on the preceding analysis and introduces a possible distribution framework for carbon revenues from international shipping—a conceptual blueprint, which aims to achieve maximum climate outcomes and support an equitable transition. This suggested framework is composed of three funding windows and three levers. The actively managed carbon revenues can be accessed via these three different funding windows, referred to as Window A, Window B, and Window C. The three levers—the recipient lever, the use lever, and the financing terms lever—operationalize which countries can access which funding window, for what carbon revenue use, and on what financing terms. The suggested framework is depicted in Figure 5.1 and will be unpacked in sections 5.1 and 5.2.

Figure 5.1: Possible distribution framework for carbon revenues from international shipping



Source: World Bank

Three levers—recipients, use, and financing terms—operationalize which countries can access which funding window, for what carbon revenue use, and on what financing terms.

5.1 Three levers to operationalize the distribution framework

Three levers can operationalize the distribution framework. These levers are important for achieving optimal climate outcomes and promoting an equitable transition. Further analyses may consider operational-level aspects such as selection criteria of project or program proposals and detailed access modalities.

5.1.1 Recipient lever

The recipient lever defines which groups of countries could access each funding window of carbon revenues. Based on the analysis presented in chapter 4, the distribution framework distinguishes three groups of countries. Each group of countries can access a different set of funding windows (see Figure 5.1):

- **SIDS and LDCs,** which often face greater barriers in accessing climate finance whilst also being the most vulnerable to climate change, could have exclusive access to funding in Window A. Additionally, SIDS and LDCs would also have access to Windows B and C—meaning these countries would have access to 100 percent of the actively managed carbon revenues. The exclusive access to Window A is to reduce competition with other countries that may benefit from greater human resources and technical capacity and ensure that countries most vulnerable to climate change are guaranteed a share of carbon revenues.
- **All other developing countries,** which are not SIDS or LDCs, would be able to bid under Windows B and C, meaning that they would be able to make bids for less than 100 percent of the carbon revenues actively managed (100 percent minus all funds available under Window A).
- **Developed countries** could have access only to funds available under Window C—meaning that they have access to a restricted portion of actively managed carbon revenues, unlike SIDS and LDCs, which can bid for Windows A and B as well, and other developing countries, which can also bid for funds under Window B.

5.1.2 Use lever

The use lever defines how carbon revenues in each share could be spent among the revenue use options most aligned with the Initial IMO GHG Strategy, selected principles, and desirable features. These have been identified in chapter 2 as *decarbonizing shipping; enhancing maritime transport infrastructure and capacity;* and *supporting broader climate aims* (see Figure 2.2) (refer chapter 2 for further details.)

Different countries could access carbon revenues for different uses to achieve maximum climate outcomes and support an equitable transition. The analysis presented in section 3.1 highlighted the need for using carbon revenues to finance the energy transition of international shipping but also the benefits of yielding greater climate benefits when using a share of carbon revenues to *support broader climate aims.* Financing broader climate aims can also support an equitable transition, as spending options related to maritime transport are likely to be limited in many SIDS and LDCs, and some other developing countries. On this basis, a possible way forward could be to allow spending on:

- **Decarbonizing shipping:** This carbon revenue use options could be open to all countries (SIDS, LDCs, other developing countries, and developed countries). As discussed in section 4.3, international maritime transport requires global investments in *decarbonizing shipping*, and early adoption of zero-carbon technologies and fuels, as this can drive their costs down. There is, therefore, a case to allow all countries to access carbon revenues to support the decarbonization of the sector.

- **Enhancing maritime transport infrastructure and capacity:** This carbon revenue use option could be accessed by SIDS and LDCs. It could also be made available to other developing countries with limited opportunities to spend on *decarbonizing shipping.*

- **Supporting broader climate aims:** This revenue use option could be available for SIDS and LDCs. As discussed in section 3.2, many SIDS and LDCs appear to have limited opportunities to spend on maritime transport projects or programs. Thus, broadening spending opportunities for these countries can help support an equitable transition. This revenue use option could also be made available to other developing countries with limited opportunities to spend on either *decarbonizing shipping* or *enhancing maritime transport infrastructure and capacity.*

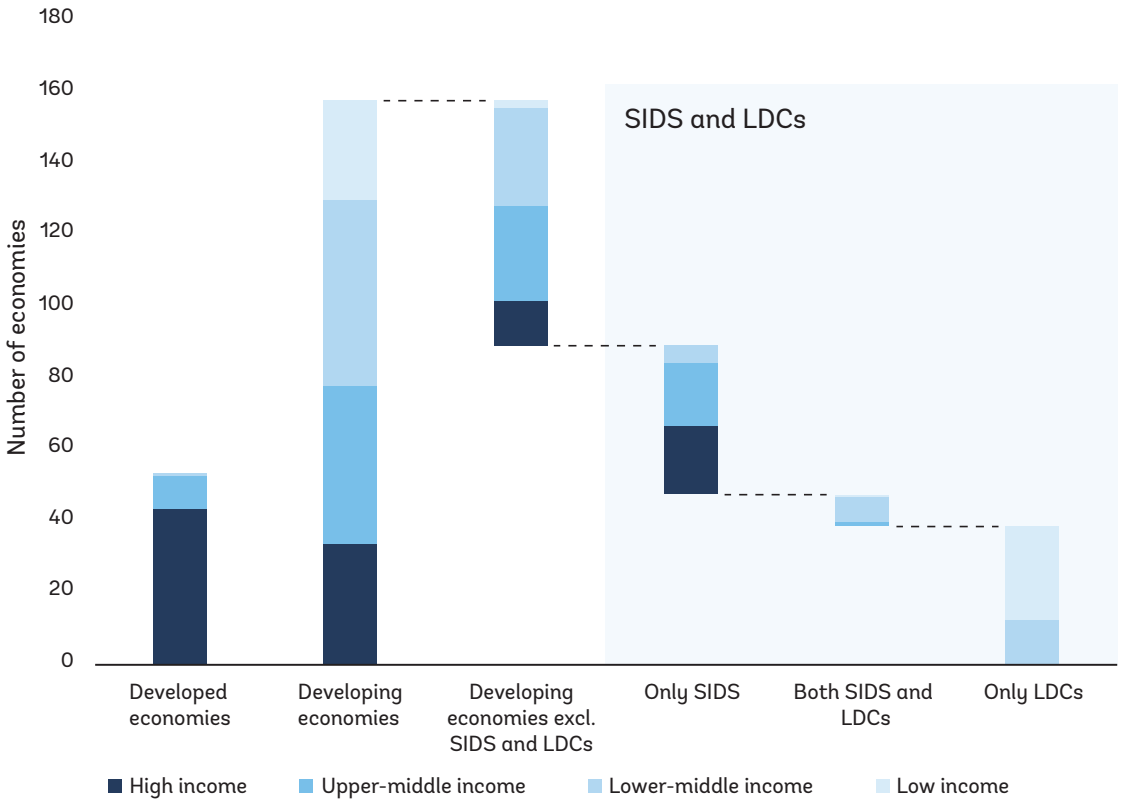
5.1.3 Financing terms lever

The financing terms lever defines what financing conditions may apply to each group of countries when they access carbon revenues from international shipping through different financial instruments. The type of financial instrument and the stringency of its conditions could vary across groups of countries, with, for instance, more relaxed conditions for SIDS and LDCs, and more stringent conditions for developed countries (see Figure 5.1).

Financing terms may be "attached" to a country, subject to a possible periodical review. To account for varying circumstances such as debt capacity and access to private capital, countries eligible to bid for funds from more than one share could potentially be subject to the same relaxed or stringent financing terms when bidding for funds from other shares. These financing terms could be reviewed periodically to accommodate changing circumstances.

Experience from climate finance can be leveraged to develop financing terms that apply to different groups of countries. Existing climate and development finance institutions and funds have established guidelines and principles for applying financing terms accounting for countries' specific circumstances. These guidelines and principles apply to different financing instruments (such as grants vs. loans) and, sometimes, groups of countries (for instance, middle-income countries vs. low-income countries).[17] Figure 5.2 illustrates the number of countries per development status and income group. Considering a country's income status can help inform the application of terms to the financing instrument available to ensure the economically viable use of revenues. Experience with existing country classification methodologies could support the operationalization of a distribution framework.

Figure 5.2: Economies by development status and income groups



Source: based on World Bank data and UNCTADstat (2023)

[17] See, for instance, GCF (2016); Climate Investment Funds (2020)

Grants and concessional loans are financial instruments that reduce the cost or provide access to capital. Carbon revenues could be disbursed through grants, loans, or a mix of the two. Grants are non-repayable funds, that can help reduce the upfront capital investment, and support countries with low debt capacity. Loans, on the other hand, are repayable funds and can be made concessional by offering the borrower financing terms that are more favorable than those available in the financial market.[18] Some of these terms include lower interest rates, reduced requirement for collaterals, extended grace periods, or longer maturity (IPCC 2014). Different combinations of these terms can apply to different countries.

Guarantees are financial instruments that reduce investment risks. Carbon revenues from international shipping could support the availability and reduce the cost of guarantees for projects supported by the fund. These instruments can, for instance, take the form of political risk insurance or credit enhancement for private investors or lenders. These guarantees, which can be provided directly or channeled through national governments, can reduce the overall lending costs or increase the credit available to governments (IPCC 2014). The terms of the guarantee could vary per group of countries; for instance, SIDS and LDCs could be offered lower guarantee fees[19] or a longer maturity of the guarantee.

Co-financing requirements can also vary across countries. For example, more developed countries may be required to co-finance (to a certain percentage) projects or programs that receive carbon revenues, while a similar condition may not apply to less developed countries.

[18] If a percentage of carbon revenues is distributed through loans, the interest on these investments could help replenish the fund or pay for the fund's operating expenses.

[19] A guarantee fee refers to a sum paid by the borrower to the guarantor.

5.2 Three funding windows to access carbon revenues

Carbon revenues could be accessed via three dedicated funding windows. The previous section discussed how three levers— recipients, use, and financing terms—can drive the operationalization of a distribution framework. This section deals with the three funding windows through which carbon revenues can be accessed and their interdependence with the presented levers. This report does not discuss the size of each funding window as a share of total available carbon revenues. Hence, funding windows are illustrated at equal size for simplification.

5.2.1 Window A: Exclusive access, broad use

Window A could be reserved for SIDS and LDCs. SIDS and LDCs often face greater barriers to accessing climate finance and are particularly vulnerable to climate change. As mentioned above, this reserved share, which equals an allocation floor for the group of countries as a whole, would reduce competition with countries that do not face similar challenges. Potentially, access to Window A could also be made available to other developing countries based on, for instance, climate vulnerability criteria.

Carbon revenues from this Window could be used for *decarbonizing shipping, enhancing maritime transport infrastructure and capacity,* and *supporting broader climate aims.* There is a double rationale for using carbon revenues in this Window beyond maritime transport-related spending. First, as discussed above, many SIDS and LDCs eligible to bid for funds from Window A are likely to have limited opportunities to use carbon revenues for maritime transport-related spending. Second, this arrangement may help achieve maximum climate outcomes as the financing gap between climate change mitigation and adaptation needs and the financial resources available in these countries is often the most significant (Soanes et al. 2021; UNCTAD 2022b; UN-OHRLLS 2022).

Countries applying for carbon revenues from Window A could enjoy access to those revenues at relaxed financing terms. These relaxed terms could come, for example, in the form of grants and with no co-financing requirements. Financing terms could vary across countries that have access to Window A; for instance, lower-income countries could have less stringent terms.

5.2.2 Window B: Broader access, narrower use

Window B could be reserved for all developing countries. This includes countries that would already have access to Window A as well as all other developing countries.

Carbon revenues in Window B could be used primarily for *decarbonizing shipping*. The key rationale for this would be to ensure that sufficient funding is available in developing countries to kickstart the production, distribution, and deployment of zero-carbon bunker fuels, and to narrow the cost competitiveness gap with conventional fossil-based bunker fuels. Since many developing countries are well-positioned to produce zero-carbon bunker fuels at scale, financing activities to decarbonize shipping in these countries in a targeted way could be key to reaching tipping points.

However, for countries with limited opportunities to spend carbon revenues on *decarbonizing shipping* alone, Window B could be extended to other carbon revenue use options. In this respect, there can be two alternatives:

- **Gradual broadening:** Under this arrangement, countries with few opportunities to spend on *decarbonizing shipping* would be able to access carbon revenues for *enhancing maritime transport infrastructure and capacity*. If they are unable to spend on *enhancing maritime transport infrastructure and capacity* either, they could be allowed to use Window B funds to *support broader climate aims* as well. There are two potential rationales for opening the option to *support broader climate aims* only when there is no opportunity to spend on the two first options:

  1. Investments in maritime transport infrastructure and capacity could actively help avoid, remedy, or mitigate DNIs of IMO climate policy measures related to transport costs.
  2. Using carbon revenues for maritime transport-related spending keeps carbon revenues closer to the sector and may, therefore, be politically more acceptable to various shipping and ports stakeholders.

- **Instant broadening:** Under this arrangement, countries that cannot spend on *decarbonizing shipping* would be able to access carbon revenues for *enhancing maritime transport infrastructure and capacity* and *supporting broader climate aims* right away. The main rationale for this arrangement is that spending carbon revenues on *supporting broader climate aims* can yield greater climate outcomes—both in terms of mitigation and adaptation—than is possible with *enhancing maritime transport infrastructure and capacity* alone. Besides, a country would only have to demonstrate once its limited opportunities to spend on *decarbonizing shipping*—this minimizes transaction costs for both the country and the entity managing the distribution of carbon revenues.

A certain percentage of Window B could even be made available to *support broader climate aims* for all developing countries to achieve maximum climate outcomes. If such a "sub-share" is included in Window B, sufficient carbon revenues should be made available for *decarbonizing shipping*, which is the main aim of this Window. A funding ceiling for *supporting broader climate aims* could be adopted for this purpose.

The financing terms for funds from Window B could vary per country. The countries that can also apply for funds from Window A could enjoy the same relaxed financing terms when accessing funds from Window B. In turn, more stringent financing terms could apply to other developing countries—potentially with further variations within this group based on income levels.

5.2.3 Window C: Open access, narrow use

Window C could be accessible to all countries. Window C could be accessed by all countries, including those that have access to Window A and Window B.

This Window could focus exclusively on *decarbonizing shipping*. The key rationale for this window is to enable international shipping to fully decarbonize as quickly as possible by reaching crucial tipping points through a collective worldwide effort.

More stringent financing terms could apply to developed countries compared to developing countries. While developed countries could access carbon revenues on more stringent financing terms, more relaxed terms could apply to developing countries, including SIDS and LDCs. These more relaxed terms could be the same as those applicable if countries bid for funds under Window A and/or B, meaning that financing conditions could be "attached" to a country regardless of the funding window they bid for. Applying more stringent financing terms to developed countries implies that they could contribute more to the replenishment of the fund through the payment of higher (but still below market) interest rates on loans.

5.3 Practical way forward

This section discusses the potential practical steps for the development of a fund and considers possible adjustments to the distribution framework over time. In particular, the section builds on experience from the creation of other major climate funds under the United Nations Framework Convention on Climate Change (UNFCCC). This is used to illustrate potential steps in the setting up of a novel fund to distribute carbon revenues from international shipping.

A common way to create a new fund through multilateral negotiations is to set up a transitional committee that proposes potential designs for the fund based on terms of reference. This was, for instance, the procedure followed by the UNFCCC to create the GCF and, more recently, is also the procedure foreseen for the new fund that deals with the response to loss and damage (UNFCCC 2011; UNFCCC 2022). In both cases, the composition of the transitional committee includes specific numbers of representatives from developed and developing countries, with a greater number of developing country representatives, as well as specified geographical representation. Following the decision to create the GCF at the 16th Conference of the Parties in 2010, the transitional committee met four times and held three workshops throughout 2011. It divided its work into four streams:

- scope, guiding principles, and cross-cutting issues
- governance and institutional arrangements
- operational modalities
- monitoring and evaluation

A technical support unit was created to assist the transitional committee with its work (UNFCCC 2011; UNFCCC 2022).

After setting up an initial framework to distribute carbon revenues from international shipping, circumstances and experience may lead to revisions over time. Periodic reviews of the framework, based on its operation, can improve its performance, and optimize its functioning to evolving circumstances. Countries' access to funding windows, the financing terms under which they can apply for funding, and the options available for spending may need to be revised over time to reflect changes in their situation (for instance, in terms of development level, capacity to access funds, and spending needs). In addition, if carbon revenues in one funding window remained unspent for a certain time, they could be shifted to another funding window. Including this feature in the distribution framework could ensure that carbon revenues are used to address climate change in a timely manner.

5.4 Conclusion

This chapter introduces a possible distribution framework for actively managed carbon revenues from international shipping. The distribution framework could be built around three levers: a recipient lever, a use lever, and a financing terms lever. The framework suggests making carbon revenues accessible via three dedicated funding windows. Each window could be accessed by selected country groups and for specific purposes. Countries could access carbon revenues on different financing terms, reflecting their varying circumstances.

6 Conclusions

06
Conclusions

This research outlines how carbon revenues from international shipping could be distributed in a way that maximizes climate outcomes and supports an equitable transition. It highlights that *decarbonizing shipping, enhancing maritime transport infrastructure and capacity*, as well as *supporting broader climate aims* represent the revenue options most aligned with the Initial IMO GHG Strategy, selected principles, and desirable features. Based on climate and equity considerations, it discusses the viability of spending potential revenues beyond maritime transport and the country groups that should be able to access those revenues. Eventually, it proposes a possible distribution framework considering key issues of the IMO debate and leveraging best practice from previous climate finance.

On this basis, the report identifies six main findings:

1. **A significant share of carbon revenues needs to be channeled to support shipping's decarbonization.** Decarbonizing international shipping will require trillions of dollars in investments. To cover these costs to a certain extent, mobilize additional private and public finance, and achieve tipping points as quickly as possible, carbon revenues should be used to finance, scale up, and accelerate the decarbonization of international shipping.

2. **Maximizing climate outcomes calls for financing climate action beyond maritime transport.** Using a share of carbon revenues to support climate action more broadly can deliver even greater climate outcomes overall as it is unlikely that the most cost-effective opportunities to mitigate or adapt to climate change will all relate to maritime transport alone. There is, therefore, a climate-related case to use a share of carbon revenues beyond maritime transport.

3. **An equitable transition can be facilitated by spending carbon revenues beyond maritime transport.** Spending carbon revenues exclusively on maritime transport is likely to limit some developing countries' access to carbon revenues. Some developing countries, including many SIDS and LDCs, as well as LLDCs have limited opportunities to spend carbon revenues on maritime transport. Therefore, using carbon revenues exclusively for maritime transport-related spending appears to be at odds with supporting an equitable transition.

4. **Prioritizing developing countries as primary recipients of carbon revenues promotes a more equitable outcome.** Developing countries tend to be more vulnerable to climate risks, have less capacity to address them, and have historically contributed less to climate change than many developed countries. Making developing countries the primary recipients of carbon revenues can help close the financing gap between current climate finance flows and their climate financing needs. In addition, carbon revenues can help address potential DNIs on States caused by implementing a climate policy measure in international shipping. Therefore, prioritizing developing countries as primary recipients of carbon revenues could promote a more equitable outcome. Besides, considering developed countries as complementary recipients of carbon revenues can further accelerate international shipping's decarbonization.

5. **Reserving a share of carbon revenues for SIDS, LDCs strengthens their ability to access and use these revenues.** Given the frequently reported capacity constraints of many SIDS and LDCs to prepare competitive funding proposals and their vulnerability to climate change, a reserved share of carbon revenues would be an advantage. This will shield them from competition with countries that face lower barriers to accessing climate finance or are less vulnerable to climate change.

6. **A revenue distribution framework built around three levers and three funding windows can effectively deliver climate and equity benefits for countries.** Drawing lessons from climate finance and accounting for key considerations of the IMO debate, such a framework can be built around three levers and three funding windows. Recipients, use options and financing terms are levers which can be adjusted to address climate and equity considerations. The three funding windows differ in their access and use modalities to account for varying development and climate circumstances across groups of countries.

This research demonstrates how the distribution of carbon revenues from international shipping can benefit from leveraging existing experience. Insights from climate and development finance provide valuable information on lessons learned and best practices. These can be utilized to design a distribution mechanism suitable to maritime transport, IMO policymaking, and the climate action imperative.

The distribution framework presented in this report introduces a new approach to distribute carbon revenues generated from international shipping. As the policy debate at the IMO and decarbonization efforts within maritime transport evolve, so can the framework. The framework has the flexibility to address questions related to legal implementation, institutional governance, and practical management.

Additional research can help further advance certain details of the framework to distribute carbon revenues. A key element of the distribution framework is the notional or relative size of each funding window. Additional research can inform the discussion on this matter and help identify how much additional public international finance is needed to catalyze sufficient private and public investments to decarbonize international shipping. Other research that could inform the sizing of funding windows are the extent to which States are impacted by policy measures to reduce GHG emissions from international shipping and the estimated carbon revenues needed to avoid, mitigate and/or remedy DNIs.

Given the urgency to address climate change, the adoption of a global policy to allow international shipping to decarbonize effectively and equitably is critical—the World Bank supports this process. The IMO is currently deliberating mid-term policy measures to deliver on the ambition levels set in its Initial GHG Strategy and revised strategy, in line with the Paris Agreement. The design of the technical and market-based measures offers the sector the unique opportunity to not only decarbonize effectively, but transition in a manner that unlocks cross-sectoral synergies, promotes development, and empowers people. The World Bank supports policymakers, industry, and civil society in the policymaking process at the IMO.

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