

## COMPARATIVE ANALYSIS OF CANDIDATE MID-TERM MEASURES

## Fact sheet

<b>Name of the candidate measure:</b>	Universal Mandatory Greenhouse Gas Levy (GHGL). <sup>1</sup>
<b>Reference document(s):</b>	MEPC 71/7/9; MEPC 76/ INF.23, MEPC 76/INF.21; MEPC 76/7/12; MEPC 77/7/4, 77/7/12; MEPC 79/INF.30; MEPC 80/INF.10; ISWG-GHG 7/2/10, ISWG-GHG 7/2/11; ISWG-GHG 12/3/3, ISWG-GHG 12/INF.4; ISWG-GHG 13/3/6, ISWG-GHG 13/3/7, ISWG-GHG 13/4/11 and ISWG-GHG 14/2/3-14/2/6.

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<sup>1</sup> The Marshall Islands and Solomon Islands, with the support of other Pacific SIDS, proposed a combination of measures comprising, *inter alia*, a universal levy operational by 2025 combined with an appropriately sequenced GFS as part of a comprehensive and equitable basket of mid-term measures. While we have focused our responses on the levy, where appropriate we also make reference to the combination and note that the comparison of approaches needs to be on the effect and impacts arising from implementation of the basket *in toto*, not the individual measures.

## 1 Feasibility of the proposed candidate measure

<b>1.1 Scope and compliance options</b>	
1.1.1 Substances covered (GHG/CO <sub>2</sub> )	<p>GHG/CO<sub>2</sub>.</p> <p>All greenhouse gas (GHG) emissions from international shipping are covered by the Pacific proposal for a combination of a universal mandatory Greenhouse Gas Levy (GHGL) followed by a Global Fuel Standard (GFS).<sup>2</sup></p>
1.1.2 Phases of GHG emissions covered (WtT / TtW / WtW)	<p>All GHG emissions from international shipping are covered by the GHGL i.e. “Well-to-Wake” (WtW) emissions for any fuel. A complementary GFS should also apply WtW, because of the environmental effectiveness (avoidance of emissions moving from sea to land).</p> <p>If elements of any basket are not using the same WtW GHG emissions scope, they will conflict in their incentivisation of different decarbonisation solutions. This situation is avoided by adopting WtW for both GHGL and GFS in combination.</p>
1.1.3 Acceptable approaches for compliance (e.g. in-sector/out-of-sector offsetting, CCS, etc.)	<p>Out-of-sector offsetting is not contemplated under the GHGL.</p> <p>In-sector offsetting, i.e. the trading of emission reduction units, is not expected to be a central element of either GHGL or GFS, compliance being achieved instead by GHG intensity reduction of every ship, and payment of a levy by every ship emitting GHG.</p> <p>When the GHGL and GFS are designed as integrated measures, rather than independently, the GHGL should significantly reduce, if not wholly remove, any need for flexibility mechanisms and in-sector offsetting related to under/over-performance issues, and therefore make Flexible Compliance Units (FCU) components unnecessary. In our proposal this is achieved by sequencing the GFS to ratchet upwards in stringency only after the GHGL has had time to incentivise the market and stimulate the supply of new technologies and alternative fuels at market scale.</p> <p>Carbon Capture &amp; Storage (CCS) use, whether onboard or upstream in the production of fuels, should be handled within the LCA Guidelines process. CCS must be rigorously accounted for over the WtW emissions lifecycle, along with certification of the integrity of its storage or any downstream emissions. Assuming CCS is included with rigour within LCA Guidelines, then it should be acceptable for compliance.</p>
<b>1.2 Likelihood to achieve a consistent implementation of the measure</b>	
1.2.1 Provisions to ensure global availability of alternative fuels and technologies	<p>The Secretariat’s key finding (MEPC 80/INF.10) regarding availability of fuels is:</p> <p><i>“[...] A clear signal of demand is needed to enable sufficient availability of candidate fuels. That signal of demand could come</i></p>

<sup>2</sup> The term “decarbonization” in this context is used to encompass the elimination of all GHG emissions from international shipping.

	<p><i>from the forthcoming Revised IMO GHG Strategy setting revised levels of ambition in combination with the policies needed to drive the transition to the revised ambition [...].”</i></p> <p>The ability of the GHGL to ensure alternative fuel and technology availability is due to the clarity and strength of the GHGL proposed, including:</p> <ul style="list-style-type: none"> <li>.1 its scope of WtW GHG emissions;</li> <li>.2 its ability to create an immediate strong signal of demand through the initial price level (USD100/tonne CO<sub>2</sub>eq);</li> <li>.3 the inclusion of revenue use for stimulating the equitable research, development and deployment (RD&amp;D) of zero emission fuels;</li> <li>.4 the attention to the use of revenues for a technologically inclusive transition; and</li> <li>.5 the demand signal clarity that it is inevitable that the price gap will be closed (ratchet) at predictable intervals at the rate needed to achieve a 1.5°C-aligned transition.</li> </ul>
<p>1.2.2 Provisions to limit administrative burden for ships and Administrations</p>	<p>Minimising administrative burden relating to a GHGL</p> <p>The GHGL is designed to ensure that a simple and predictable payment will be levied on all bunker fuel. All literature to date concurs that a levy will have a lower administrative burden and require less complexity than a form of ETS, the most referenced alternative. In addition to limiting administrative burden for ships and administrations, the GHGL reduces administrative burden for the system as a whole when compared to other economic instruments, as it does not require the creation, regulation and policing of a primary and secondary market in GHG offsets or other trading mechanisms. The primary revenue collection system recommended is at the point of bunker, which is administratively straight-forward and similar in nature to the proposals by ICS and others. If implementation of measures comes at an increased administrative burden to business as usual (BAU), the GHGL is the most efficient administrative option for an economic element.</p> <p>Minimising administrative burden through the design of an integrated basket of measures</p> <p>A combined GHGL and GFS can be designed in a way to minimise the administrative burden. The GFS as currently proposed by Austria et al. includes economic elements (FCUs and GHG Remedial Units) which add administrative complexity through the duplication of market mechanisms to provide flexibility. An integrated basket combining GHGL and GFS manages the under/over performance issues without the need for flexibility mechanisms enabling a simpler design of GFS and simpler basket.</p>

	<p>Further clarity in the demand signal is provided when the GHGL is designed to act in combination with the GFS. Even if both are agreed and adopted at the same time, sequencing the GHGL as the earlier driver of energy transition (as the clear demand signal for initial, but small volume use of non-GHG zero emission solutions) followed later by the GFS set for rapidly reducing fuel GHG intensity (to provide the clear demand signal for mass market adoption of non-GHG zero emission solutions), reinforces the inevitability of the transition to the market without constraining international shipping initially whilst global alternative fuel markets develop (which would happen if the fuel standard is used as the driver of transition from the outset). This also allows for the design of both levy and fuel standard to be as simple as possible, a vital element in achieving consistency, reducing administrative burden and enabling ease of appropriate monitoring, reporting and verification (MRV) tools and processes.</p> <p>Minimising administrative burden relating to revenue use / disbursement</p> <p>Any effective basket of measures designed to address the price differential between fossil fuels and alternative fuels generates revenue as a by-product. To be effective at “promoting the energy transition of shipping and providing the world fleet the needed incentive” (as summarised by the Chair at ISWG-GHG 13), a policy package will generate significant revenues. The World Bank estimates the revenue stream from a carbon price geared to the Levels of Ambition in the Initial Strategy at USD\$1.2 -2.6 trillion or between USD\$1 and 2 trillion for full decarbonisation by 2050. Management of any revenues will result in an administrative burden and the end use of the revenues will determine the scale of administrative costs required to effectively and efficiently manage the funds. The final use of funds is still to be agreed, however according to existing international norms, the principle of Polluter Pays requires investment in both in-sector mitigation and reparation for the damage to the environment and communities. Given the unprecedented scale of this transition and the unique nature of the revenues, a levy on international pollution, the most efficient and effective administrative option involves a dedicated and independent fund manager and associated coordination between a number of UN agencies including IMO, UNCTAD and UNDP. Where objectives for revenue use align with existing multilateral fund management and disbursement structures, these could be leveraged to increase efficiency and cost-effectiveness.</p>
<p><b>1.3 Compatibility and consistency with existing regimes/regulations</b></p>	
<p>1.3.1 Consistency with UNFCCC and the Paris Agreement</p>	<p>The combination of the GHGL and GFS is fully consistent with existing IMO policy and will be enabled via relevant amendments to MARPOL Convention. The use of financial instruments advanced under the principle of Polluter Pays is well preceded in the Organization’s oil spill response programming. The use of universal, mandatory global fuel standards has also been used previously by the Organization, most recently in regard to sulphur</p>

	<p>standards. The deployment of a GHGL is not inconsistent with WTO or other related policy regimes.</p> <p>Consistency with UNFCCC and the Paris Agreement</p> <p>The GHGL is consistent with the UNFCCC and Paris Agreement, and in particular with:</p> <ul style="list-style-type: none"> <li>.1 the need to peak global emissions as soon as possible consistent with pursuing efforts to limit temperature increase to 1.5°C above pre-industrial levels;</li> <li>.2 the need to consider human rights, the rights of indigenous peoples, and the principle of intergenerational equity;</li> <li>.3 the need to provide support to developing countries, particularly SIDS and LDCs, in responding to climate impacts; and</li> <li>.4 the requirement of Article 2.1.c to ensure financial flows are consistent with a pathway towards low GHG emissions and climate-resilient development.</li> </ul> <p>Any out of sector offsetting is fundamentally unnecessary and ill-advised in relation to the elimination of emissions from international shipping. Accordingly, no interaction with Article 6.2 or 6.4 of the Paris Agreement should be contemplated.</p> <p>Compatibility and cognisance of Common but Differentiated Responsibilities and Respective Capabilities in light of National Circumstances (CBDR-RC&amp;NC)</p> <p>The combination of GHGL and GFS proposed is fully consistent with equity and the principle of CBDR-RC&amp;NC, with allocation of revenues primarily to nation States and prioritised by need and equity relative to a State’s responsibility and capabilities. CBDR-RC&amp;NC defines a differential relationship between States, not between States and the shipping industry. In our proposal, revenues are generated via financial contribution levied on the polluter, i.e. ships, not States, under the principle of non-discrimination and utilising the established IMO convention of No More Favourable Treatment. Revenues are disbursed as guided by the principle of Polluter Pays with any differential allocation guided by equity and CBDR-RC&amp;NC.</p>
<p>1.3.2 Coordination / overlap with other international, regional and national initiatives</p>	<p>The GHGL is fully aligned with the most important “international initiative” to address climate change: the UNFCCC and Paris Agreement. Successful implementation of the proposed combination of a GHGL and GFS for shipping allows for GHG emissions reduction commensurate with its ‘fair share’ of maintaining a 1.5°C agenda.</p> <p>By enabling revenues to empower an equitable transition for all States and through allocation of revenues for investment in and out of sector, the GHGL contributes directly and positively to</p>

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delivery of the 2030 Agenda for Sustainable Development and its associated Sustainable Development Goals (SDGs). Document MEPC 79 INF. 30 outlines a large number of SDGs that are affected by international shipping's decarbonisation.

There is both risk and opportunity across many SDGs showing how important it is to consider issues beyond GHG reduction in the IMO's Revised Strategy and the actions that implement the Strategy. The wider SDG opportunities are only enabled if the mitigation of shipping emissions reflects the different development needs and capacities of States, in particular through the enabling of equitable transition which comes with the use and disbursement of revenues. Document MEPC 79 INF.30 also notes that policy that is designed for mitigation only (such as the GFS if it is implemented without a GHGL), carries significant risk of undermining SDG efforts and reinforces the analysis of the World Bank on this point that strategically using some revenues beyond the shipping sector could address equity concerns more extensively and more cost-effectively than a narrow focus on in-sector mitigation.

The proposed GHGL is the only policy measure that the Organization is currently considering that has been designed around enabling an equitable transition - given its focus on the combination of 1.5°C-aligned mitigation and revenue disbursement across a range of "just", "equitable" and "fair" components (including in relation to participatory, technology and climate impacts). With the prioritisation of revenue use for the most climate vulnerable, the maximum possible closing of the "sustainable development gap" is enabled.

#### Regional initiatives

Regional initiatives to regulate international shipping emissions carry significant risk of increasing inequity, and countering efforts to address SDGs. They increase transport costs for those trading with the implementers of regional initiatives, and revenues support regional member States and regional shipping at the expense of those from outside the region. The GHGL is not designed to "coordinate" or "overlap" with any national or regional initiative. As the sole global regulator of international shipping, addressing such issues is not the task of the Organization. Avoiding any potential "overlap" of a national or regional initiative with an IMO measure is the sole responsibility of the enactor of the relevant national or regional initiative. It is anticipated that on adoption of the Revised Strategy including a basket combining GHGL and GFS, regional initiatives to regulate emissions from international shipping would become redundant and would be withdrawn.

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1.3.3 Compatibility with other IMO regulations	The GHGL is fully compatible with all other IMO regulations.
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## 2 Effectiveness of the proposed candidate measure

### 2.1 Expected reductions in GHG emissions

2.1.1 Levels of GHG reduction with associated timeframe

The combination proposed, assuming it is implemented according to the timeframes recommended, is the best available path to achieving a 1.5°C aligned transition trajectory. The Levels of Ambition targets for 2030, 2040 and 2050 which the measures are expected to support are those listed in our submissions. If the combination is introduced at either reduced stringency or delayed timelines, then the overall cost will be greater than acting decisively now.

The speed and degree to which the recommended entry level price (coupled with an agreed review and ratchet) results in market uptake is unknown and subject to various related influences and multipliers, including the degree of independent market uptake and acceleration of national subsidisation in key industry sub-sectors of major shipping nations. The entry price (USD\$100 ton/CO<sub>2</sub>e) was determined in 2019 after comparison of the best available published expert advice. Since then, various analyses, including that of industry, have argued the entry price should be higher. The trend toward a decarbonised industry is now entrenched, and while investment is still low compared to that needed, it has undoubtedly accelerated in the past five years. Increasingly transition is being viewed as a "trillions" investment opportunity for the industry as opposed to a challenge. Whether USD\$100 ton/CO<sub>2</sub>e is now sufficient to incentivise the market momentum needed, or should be set at a higher rate, should be a key component of discussion under Phase III of the Work Plan to Progress development of mid- and long-term GHG reduction measures.

The GHGL requires regular review and ratchet to ensure the combination is providing adequate incentive to achieve the GHG-related Levels of Ambition in the Revised Strategy. This is an essential component of providing regulatory certainty for the industry. Accurate MRV should inform the 5-yearly review and ratchet process.

2.1.2 Provisions to avoid unintended outcomes that could increase GHG emissions

The GHGL is designed to apply to all WtW lifecycle GHG emissions attributable to international shipping. This will prevent the increased production and use of fuels that produce low- or zero-GHGs upon combustion, but have substantial lifecycle emissions. Such an outcome is an entirely foreseeable (i.e., not unintended) outcome of only pricing tank-to-wake emissions.

The highest standard of LCA Guidelines must be adopted in order to protect environmental integrity, sustainability, human rights and the rights of indigenous peoples, and to ensure IMO policy leads to an accelerated overall reduction in global emissions.

The GHGL can be universally implemented from its inception. This will deter the further ordering of ships not able to run on low-



	or zero-emission fuels – another foreseeable outcome of further regulatory delay.
<b>2.2 Incentives for first movers</b>	
2.2.1 Provisions for reducing/bridging the price gap between conventional and low-carbon solutions	<p>By imposing an additional cost on conventional fuels, the GHGL incentivises first movers to maximise existing efficiencies, and to adopt available low-hanging interventions that reduce fuel demand, such as wind assistance. By signalling the inevitability, scale and trajectory of change required, the future demand for alternative fuel is clearly signalled and enables strong investment that can ensure adequate supply (document MEPC 80/INF.10). The size of the price gap currently fluctuates considerably as a result of the price volatility in both fossil and non-GHG fuel and technology markets. Non-GHG emitting alternative fuel prices are predicted to decrease with increasing supply due to economies of scale, with acceleration of this trend being largely dependent on the stringency of the policy signals set in the Revised Strategy (which is why certainty of ratchets in carbon price over time are proposed).</p> <p>Fluctuations in the price gap between conventional and alternative solutions are unpredictable due to the significant price volatility of conventional fuel oil. The past 25 years have seen an overall upward trend to average prices of crude oil above USD\$40/bbl, and prices regularly over USD\$100/bbl. In price per tonne of fuel oil, these have resulted in fluctuations between ~USD\$250/t and ~ USD\$700/t. The impact of the entry level price for the GHGL proposed is therefore significantly less than the irregularity the market currently sustains under normal oil price movements.</p> <p>Over the course of the transition the risk of a sudden or prolonged collapse in the price of conventional fuel oil must be considered, as this could undermine the effectiveness of a GHG price in making the investment case for non-GHG solutions. The development of safeguards to be implemented in such a situation is a matter to be further considered in Phase III. However, it is also a strength of the combination of economic and technical elements (e.g., GHGL and GFS) that the incentive on energy transition of shipping is sustained in spite of short-run fluctuations in prices.</p>
2.2.2 Provisions to ensure a level playing field	<p>The measure is designed to ensure a level playing field through being non-discriminatory, universal and mandatory with resultant revenues managed independently and transparently by a dedicated fund manager.</p> <p>By pricing emissions from shipping on a WtW lifecycle basis, the GHGL is designed to create a level playing field in the production of zero emission fuel for shipping. This could see the majority of such fuels produced in the developing world, given its abundance of renewable energy potential. Revenue from the GHGL would help level the playing field in relation to the investment attractiveness of renewable energy projects in developing</p>

	<p>countries. Combined with LCA Guidelines that protect environmental integrity, this is also a core component of ensuring consistency with the Paris Agreement and in particular Article 2.1.c.</p> <p>The proponents of the GHGL have previously provided detailed submissions regarding their commitment to achieving an equitable transition, including concrete discussion on the need to ensure procedural equity, equity in maritime mitigation, and equity in responding to climate impacts. All of these are directly relevant to any comparative analysis of measures related to “ensuring a level playing field”.</p>
<p>2.2.3 Provisions to ensure global access to technology</p>	<p>Assuming that the recommended text confirming the Organization’s commitment to an equitable transition is incorporated in the Vision and Levels of Ambition sections of the Revised Strategy, alongside agreement that the market-based-measure (MBM) is advanced under the Polluter Pays principle, then the combination of measures is primed to deliver a resourced process for ensuring equitable access to technologies, with the significant revenue raised by the GHGL allowing, <i>inter alia</i>, for support for RD&amp;D of technology across the globe.</p>
<p><b>2.3 Compatibility of different elements within the basket of measures</b></p>	
<p>2.3.1 Identification where elements of the measure are complementary to each other without overlap or redundancy</p>	<p>The GHGL combined with a properly sequenced GFS are proposed as the key components of an integrated basket of measures that complement each other. We have purposely not elaborated a detailed design option for the necessary GFS component of the combination. The general concept of a GFS is well understood, what is at debate is the detail of the scope, stringency, timeframes, enforcement and review.</p> <p>In our proposal, the GFS’s driving of use of non-GHG zero emission solutions is sequenced to follow the GHGL, allowing the market signal for clear future demand to take effect before imposing regulatory compliance obligations on ships. Imposing a GFS very early in the transition generates issues with fuel availability that must then be addressed through complicated flexibility mechanisms. These issues can be avoided by sequencing the GFS to rapidly increase in stringency from 2030 onwards, while implementing the GHGL from 2025.</p> <p>As has been widely noted, a major advantage of the GHGL is that it provides flexibility for compliance. If the limiting issue of future fuel availability is resolved, which according to the technical analysis<sup>3</sup> is primarily an issue of the current absence of sufficiently clear signal of demand, then there should be no greater administrative burden to implementation and enforcement of the GFS for GHG than the current successful GFS equivalent for SO<sub>x</sub> (IMO 2020 fuel oil sulphur limit).</p>

<sup>3</sup> Document MEPC80/INF.10.

<p>2.3.2 Provisions to avoid double accounting, payment, reward or punishment</p>	<p>No issue of double accounting compromising environmental integrity should occur when emissions from international shipping are priced on a WtW lifecycle basis, as they must be for a GHGL.</p> <p>Payment for emissions from international shipping under both an IMO pricing system and a regional or national pricing system, is possible. “Double payment, reward or punishment” are potential risks in two regards; between the measures in the global basket of measures, and between the global basket of measures and regional or national measures.</p> <p>In the case of a GHGL/GFS combination, there is potential for double accounting where revenues are generated by the charges levied on bunker and potentially also by some form of penalties for noncompliance with the GFS. This is ameliorated by sequencing the GFS after the levy, keeping the GFS in its simplest possible form and applying it with stringency after the market for non-GHG solutions has had the opportunity to mature. Port and flag State Control can be maximised as the dominant enforcement measure, with the need for financial penalties likely being minimal.</p> <p>In the case of overlap between global and other regimes, were they to occur, such double payments are a matter to be addressed regionally or nationally and as such, have not been considered in the design of this combination. It is assumed a single international system is the most desirable outcome for all member States and the only one that can potentially deliver an equitable transition. Payments under any IMO system must be applied universally and without discrimination.</p>
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**2.4 Process for development and implementation**

<p>2.4.1 Possible legal framework</p>	<p>The GHGL is applied internationally. Therefore, existing international legal norms will apply to collection and use of the revenues generated. The proponents reiterate their suggestions for text strengthening the Principles section of the Revised Strategy in this regard.</p> <p>The proponents have proposed amendments to MARPOL Annex VI in document MEPC 77/7/4 (Marshall Islands and Solomon Islands) as have other submitters. There is consensus among proponents of measures that this is the appropriate legal framework. This being the case, consideration of the revision should be initiated as soon as possible so that implementation of the agreed basket is not delayed unnecessarily.</p>
<p>2.4.2 Expected timeframe for development and implementation</p>	<p>To be aligned with a 1.5°C pathway the GHGL needs to be operational by 2025, to help advance early adoption and use, and to sustain the momentum that has already been built through some industry’s leadership. The GFS should be adopted/agreed at the same time as the GHGL so it provides a strong and early signal on the rate of demand growth for non-GHG solutions and provides industry with plenty of time to prepare for the energy transition of international shipping. However, it should only be set</p>

	<p>to start to drive the transition after the GHGL has been in operation for a period - e.g., with increasing stringency from 2030. This is an ambitious but feasible timeline, and is in line with the recognized need for accelerated action in this critical decade.</p> <p>Timeframes to develop and implement measures in the Revised Strategy must be set with full knowledge of the scale and urgency of the climate crisis. Agreement on the overall combination of measures needed for a 1.5°C aligned basket for inclusion in the Revised Strategy text at MEPC 80 and then approval at MEPC 81 is required. The most recent analysis, including that commissioned by the Organization, concurs that the transition is feasible if the right policy signals are sent now. The science confirms this level of urgency is required.</p>
2.4.3 Mechanisms of accountability and adjustment	The GHGL must be regularly reviewed and ratcheted to address the price differential with non-GHG emitting alternatives and five yearly reviews/upwards ratchets have been proposed.

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### 3 Potential impacts on States of the proposed candidate measure

<b>3.1 Initial impact assessment</b>	
3.1.1 Does the proposal provide a description of impacts on ships and emissions?	The respondents provided an initial impact assessment (IIA) in MEPC76/INF.23 (Marshall Islands) of the impacts on States.
3.1.2 8 Impact criteria assessed	<p>Geographic remoteness of and connectivity to main markets</p> <p>In a global economy undertaking rapid decarbonisation to avoid the worst effects of climate change, States that are remote and with poor connectivity to main markets can be expected to have improved connectivity through a GHGL advanced under the principles of Polluter Pays and Equity. Without efforts like the GHGL that will encourage investment in the RD&amp;D of zero and low-carbon ship technologies, these supply chains may increasingly become stranded and uncompetitive with increasing technology disequity. The timescales to decarbonise global supply chains are long, and without starting this process now with a measure capable of achieving their full decarbonisation, there are increased risks of decreased connectivity, particularly for SIDS and LDCs. The GHGL also provides the potential for States experiencing disproportionate negative impacts to use revenues raised to offset the transport cost increases associated with the levy price and/or the higher cost of fuels. The States most likely to be impacted are expected to be those SIDS and LDCs that are already the most remote and face the poorest connectivity to main markets. Further analysis will be needed to understand the potential for this revenue use to fully address disproportionate negative impacts of this nature.</p> <p>Cargo value and type</p> <p>The largest risk to global movements of cargos of any value and type is a lack of access to a decarbonised supply chain. With energy and industrial decarbonisation on land, and increasing deployment of the circular economy, the market is creating competition for global trade from more locally produced/sourced/recycled goods and materials. The GHGL reduces the economic impacts for any State associated with the trade of any cargo value and type by providing a pathway to sustainable trade-led economic development. All policy measures that reduce GHG emissions in line with the Levels of Ambition will create an increase in transport cost which can have an impact on trade. The GHGL has been designed to achieve GHG emission reductions with maximum cost-effectiveness by stimulating an efficient early adoption of non-GHG zero emission solutions, which helps to develop global availability and reduce the cost of these solutions, prior to their mass market adoption which would be driven by a combination of GFS and GHGL. In addition to minimising the increase in transport cost associated with the energy transition and therefore minimising impacts on trade, the GHGL also generates revenues that can be used to manage and</p>

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mitigate Disproportionate Negative Impacts (DNI). Lower value cargos can have a higher portion of their total costs associated with transport, and so there may be differentials in the impacts experienced by States with particular exposure to import/export of low value cargos, but this will also depend on the nature of the supply chains and substitution options for that trade. Further analysis on this, and the potential for the proposed revenue use to fully address any identified DNI, will be needed in Phase III.

#### Transport dependency

States that are highly dependent on marine transport can minimise the risk of negative impacts by adopting well-managed, global, and timely decarbonisation of transport. The GHGL can therefore assist with addressing this negative impact.

#### Transport costs

The application of a levy can increase transport costs in the short-term (e.g., during the transition to increasing the use of zero carbon fuel and energy sources). The way in which costs increase depends partly on the level of competition on the trade routes servicing a route, as well as the response created by the levy. For routes with adequate competition this can ensure that the levy stimulates decarbonisation of the transport services. Where less competition exists, there are risks that the levy may create an impact on a State without also transitioning the transport service to lower carbon operation. Further analysis is likely to be needed to understand these cases and ensure that further policy or adjustments avoid disproportionate negative impacts on countries with less competition for transport services. In the longer-term, a levy need not be associated with any greater transport cost increase than is already anticipated to meet decarbonisation in line with the IMO's Initial Strategy's vision of full decarbonisation. As shipping trends towards the full use of zero carbon fuel and energy sources, GHG emissions trend to zero and the amount payable on the levy (on GHG emissions) trends to zero.

#### Food security

Climate change also poses a major risk to food security in many countries. Ocean acidification in particular poses high risks to marine ecosystems in many SIDS and LDCs. Accelerating rates of climate change can also damage land-based production of crops and staples. The GHGL's potential to contribute to the mitigation of climate change is therefore a key positive impact on food security. There are potential short-term impacts on food security – where any transport cost increase in the short-term flows through to prices and/or availability of food. This is complex and will vary as a function of the substitution opportunities available, which can vary on a country-by-country basis. As the shipping sector reaches full decarbonisation, the impact on transport cost will be diminished (see 'transport costs') and so too will be the policy's negative impacts on food security. Addressing

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these potential negative impacts could be built into the detailed design of the use of revenues, and can be the subject of further analysis.

#### Disaster response

The negative impacts of natural disasters, and the pressures on response capacity are directly driven by the frequency and severity of natural disasters. Climate change increases the frequency and severity of many types of natural disaster. As with other types of impacts, the GHGL's mitigation of GHG emissions (and the risk of increasing frequency and severity of natural disasters) is a primary and positive impact. In some countries, especially many Pacific SIDS, capacity for both disaster preparation and response is directly related to the volume of shipping. Any additional increase in transport cost will affect not only the price but the frequency and security of maritime connectivity. Ships are essential for immediate disaster response for isolated maritime communities and for the longer term recovery. The scale of this issue is unclear, but in the particular instance of oceanic maritime island nations, with the longest thinnest supply routes in the world and already the most vulnerable to natural and climate change related disasters, it is a pressing concern. We note that many Pacific Island States can be considered to be in a constant state of disaster response and recovery which is only exacerbated as the climate emergency deepens. The extent of this and the potential for this to be addressed through use of revenues will need careful consideration. The impact may not be universal; it is a clear example of disproportionate negative impact.

#### Cost-effectiveness

The GHGL provides the quickest route to decarbonisation and the only one that is 1.5°C aligned. Recent analysis (including document MEPC 80/INF.10) concurs with other expert reports that the cost of inaction will outstrip the cost of action and that policy not financing are the barriers that need addressing. The GHGL's cost-effectiveness should be assessed in combination with other policy options. The GHGL has well-justified potential to incentivise an effective transition away from fossil fuels in two ways:

1. push - the setting of a clear price on GHGs which stakeholders in the shipping industry have been calling for in order to create a business case for investment in zero carbon shipping and associated infrastructure; and
2. pull – the deployment of some percentage of the revenues into the sector in order to stimulate technology development and deployment.

The GHGL's effectiveness should not be considered in light of the GHG mitigation effects alone, but also its effectiveness at addressing impacts and other co-benefits. The policy leverages well recognised, developed and existing infrastructure, minimising the cost to achieve high effectiveness. The GHGL has

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	<p>a portion of the revenues raised to enable the administration of the policy. It is therefore an attempt to be inclusive of all expected costs, and to use revenues to ensure effective implementation and maximise the cost-effectiveness.</p> <p>The use of a partial feebate mechanism, to automate the disbursement of revenues, provide the clearest rules to industry stakeholders to build commercial strategy from, and reduce the admin burden is also focused on maximising the policy option's cost-effectiveness. There is high confidence that the GHGL will be cost-effective.</p> <p>Socio-economic progress and development</p> <p>Dangerous climate change, left unchecked, has well known significant potential to retard and then reverse socio-economic progress and development. Addressing and avoiding the impacts of climate change is a collective-action problem that requires all sectors to respond rapidly, extensively and urgently. The shipping sector's ~1bn tonnes of GHGs, in combination with the long-life of assets used in the sector, creates material risk of a failure to achieve stabilisation of the global climate at or below 1.5°C relative to pre-industrial temperatures (and the economic consequences of that). The most severely impacted States from this outcome are SIDS and LDCs and other climate vulnerable States, and in many cases, the threat is existential. But all countries are vulnerable in different ways to these impacts. The GHGL is critical for ensuring that this ~1bn tonnes of GHGs is rapidly reduced, especially given that there is no other policy measure currently being considered at IMO that is close to performing a similar function. Whilst in parallel to mitigating the largest known risk to global socio-economic progress (climate change), the GHGL will also create large revenues for use in the Green Climate Fund or equivalent structures. This has the potential to play a significant role in the rebalancing of a global economy which has persistent and increasing inequality. There is therefore a potential for a strong net-positive impact on socio-economic development, and in particular in those States currently in greatest need of development (SIDS and LDCs).</p>
<p>3.1.3 Potential positive and negative impacts</p>	<p>The IIA noted that the GHGL is expected to be a driving force for rapid decarbonization in line with an emissions trajectory consistent with stabilisation below 1.5°C in line with the latest IPCC advice. The primary impact arising from the policy measure is therefore the positive impact of minimising the multiple severe, and in some cases, existential damages attributed to the impacts of climate change, that will only increase as temperatures increase.</p> <p>In addition to this positive impact, the IIA noted the potential for negative impacts arising from any resultant increase in transport cost. Such transport cost increase will vary for different member States, and in most cases is likely to still be within the bounds of recently experienced historic transport cost fluctuations. The severity and disproportionality of the impacts will likely vary depending on the specifics of a State, and this can benefit from</p>



	<p>further analysis. In anticipation that there can be disproportionate negative impacts that arise from the policy measure, the GHGL is designed to be inclusive of a significant revenue deployment to assist in addressing disproportionate negative impacts that arise.</p>
<p>3.1.4 Extent of the impacts on States</p>	<p>The precise extent of the impact on individual States is unknown. It is recognized that even with a lot of further analysis, some impacts may not be quantifiable or identifiable. However, uncertainties of impacts must not preclude consideration or adoption of a policy measure. The analysis presented to the Committee from multiple sources is clear that the cost to both industry and society of not acting decisively is going to be greater than the cost of action. The overall impact of decisive action on trade, in the greater majority of cases, is likely to be marginal.</p>
<p>3.1.5 Description of methodological tools and data sources used</p>	<p>The IIA used qualitative analysis. This reduces the specificity on a per-State level of the measure but does not diminish the validity of the impact estimation. The qualitative assessment of impacts on States were derived from available literature and studies. It is recognized that even with further analysis, some impacts may not be quantifiable or identifiable. However, uncertainties of impacts must not preclude consideration or adoption of a policy measure.</p>
<p><b>3.2 Possible disproportionately negative impacts</b></p>	
<p>3.2.1 Is the measure likely to result in disproportionately negative impacts on States?</p>	<p>On the evidence thus far presented to the Committee, the overall negative impact of decisive action, in the greater majority of cases, is likely to be marginal. Where DNI is shown to occur, States such as Pacific SIDS and other climate most vulnerable will be the most affected and will require proportionate compensation. One of the purposes of the comprehensive impact assessment (CIA) is to confirm or otherwise address such assumptions.</p>
<p>3.2.2 Description of how these impacts could be addressed (e.g.: avoided, remedied, mitigated), as appropriate</p>	<p>The CIA that occurs before the adoption of the measures should be focused on avoiding DNI, through recommending appropriately targeted investment of revenues, rather than on compensating for it if and when it occurs. Where it is not avoidable, appropriate and proportionate compensation will be required.</p>