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WORKING GROUP ON REDUCTION OF  
GHG EMISSIONS FROM SHIPS  
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Agenda item 3

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**FURTHER CONSIDERATION OF CONCRETE PROPOSALS ON THE REVISION  
OF THE INITIAL STRATEGY, AND INITIATION OF THE DEVELOPMENT  
OF A REVISED STRATEGY**

**Suggested text for the Revised Strategy including proposal to include an additional  
interim level of ambition for 2030 in terms of the percentage of energy used by  
international shipping to be produced from alternative fuels**

**Submitted by ICS**

**SUMMARY**

*Executive summary:* In the annex to this document, ICS suggests specific text to be considered for inclusion in the Revised Strategy to help facilitate discussion by the Group but remains open to considering other ideas that may be suggested. Further to document MEPC 78/7/2 (ICS), this text now includes a suggested interim level of ambition given in terms of the percentage of energy used by shipping to be produced from alternative fuels in 2030 to reach a "take off" point on a pathway to complete decarbonization. The suggested draft text still includes, inter alia, a reference to a "net" zero emissions target for 2050, but ICS clarifies that the term "net" does not imply use of out-of-sector offsetting measures to achieve this level of ambition. To address matters related to safety and environmental issues potentially associated with the use of alternative fuels, ICS also suggests a goal of having the necessary regulations for the construction and operation of ships using alternative fuels, as well as necessary changes to seafarer training standards, adopted by the Organization by 2028 or sooner.

*Strategic direction,  
if applicable:* 3

*Output:* 3.2

*Action to be taken:* Paragraph 22

*Related documents:* MEPC 77/7/22, MEPC 77/16; MEPC 78/7/2; ISWG-GHG 13/4/9 and resolution MEPC.304(72)

## Introduction

1 MEPC 78 agreed that ISWG-GHG 13 should commence work on the revision of the Initial Strategy, for adoption by the Committee in spring 2023. Taking account of the Code Red IPCC report in August 2021 and the outcome of COP 26, and as previously stated in document MEPC 78/7/2 (ICS), ICS reiterates that the Revised Strategy needs to significantly increase the level of ambition currently set out in the Initial Strategy. This is why ICS supports the adoption of a "net" zero CO<sub>2</sub> target for 2050 or a similarly ambitious mid-century target.

2 In view, however, of the short time available for the Group to complete this important work, ICS suggests that rather than producing an entirely new document, the Committee can readily develop an ambitious Revised Strategy by making a relatively small number of changes to the text of the current Initial Strategy, as set out in the annex to resolution MEPC.304(72). To help the Group to expedite its work, this document suggests some text revisions which might be made to the Initial Strategy, together with the rationale for these changes, the most important of which relate to the "Levels of Ambition".

### ***An interim alternative energy target for 2030***

3 Taking account of informal discussions with Member States and other delegations in the context of the development of mid-term measures to be considered by the Group under agenda item 4, ICS now wishes to suggest that the Revised Strategy should include an additional interim target for, for example, 5% of the energy used by shipping in 2030 to be produced from alternative fuels (however these might be defined by the Organization). This would be in line with the goals of Mission Innovation's Action Plan for the Zero-Emission Shipping Mission, adopted in September 2022, which is supported by the Governments of Denmark, France, Ghana, India, Norway, Morocco, Republic of Korea, Singapore, United Kingdom and United States.<sup>1</sup> However, it should be reiterated that these alternative fuels need to be made available both in terms of quality and quantity.

4 The reason for proposing that such an interim target should be based on the energy produced using alternative fuels (however these might be defined by the Organization) is that most alternative fuels have a different energy density to each other and to conventional liquid fuel oil. For example, ammonia has an energy density by mass of 0.43 of Diesel/Gas Oil.

5 The objective of establishing such an interim level of ambition for the percentage of energy produced from alternative (low and net zero emission) fuels by 2030 is to give impetus to the development of a "basket" of mid-term measures that would make delivery of such an objective possible. In particular, this is to help international shipping reach a "take-off" point by 2030 on a pathway to full decarbonization. As will be considered under agenda item 4, such mid-term measures might include an economic measure as well as, potentially, a complementary technical measure, such as the proposed Global (GHG) Fuel Standard.

6 Taking account of the proposals for a fund and reward (F&R) system, including a revised proposal set out in document ISWG-GHG 13/4/9 (ICS), whereby ships would receive rewards for the CO<sub>2</sub> emissions prevented by the use of "eligible alternative fuels", establishment under the Revised Strategy of a target in 2030 for, for example, 5% of the total energy used by international shipping to be produced from these alternative fuels would allow the Organization to calculate the funds that would be needed to support such a rewards programme, which in turn would assist discussion on the possible quantum of the contribution per tonne of CO<sub>2</sub> emitted to be made by ships, to an IMO fund, as part of an economic measure.

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<sup>1</sup> [Zero-Emission-Shipping-Mission-Action-Plan.pdf \(mission-innovation.net\)](#) (accessed 27 September 2022).

7 As set out in document MEPC 78/7/2, ICS reiterates its support for the adaption of a net zero target for 2050 as part of the Revised Strategy, but remains open to considering a similar mid-century (e.g. a "carbon neutral") target as may be proposed by others. But regardless of the levels of ambition set out in the Revised Strategy adopted in 2023, ICS will remain committed to helping the entire international shipping sector achieve net zero CO<sub>2</sub> emissions by 2050. Furthermore, inclusion of a "net zero" target by mid-century could negate the need for carbon intensity goals beyond 2030.

8 ICS is committed to a net zero target for 2050. But to ensure that the high levels of ambition adopted as part of the Revised Strategy are plausible, ICS suggests the Organization consider commissioning appropriate research to demonstrate how, for shipping, the pathway to net zero CO<sub>2</sub> emissions by 2050 can realistically be achieved. In view of the typical 25-year life span of newly constructed ships, and taking account of the decision by MEPC 78 not to proceed with the development of the IMRB/F, this research could take account, inter alia, of the expected increase in Technology Readiness Levels (TRL) by 2030 and the expected availability of net zero-carbon technologies and fuels. Given that the development of relevant technologies, fuels, propulsion systems and related infrastructure required will be the responsibility and in the control of stakeholders other than shipowners, it is suggested that this research (or alternatively the Revised Strategy) should also include a full assessment of the macro-economic impacts on States of the proposed levels of ambition in the event that an accelerated increase in TRLs is not achieved by 2030.

#### ***Adoption of a "net" zero target rather than an absolute zero target***

9 The adoption by IMO of any zero emissions target which does not include the word "net" (or a term such as "carbon neutral") would imply that the target adopted is for the international shipping sector to reduce its "absolute" emissions to zero by whatever mid-century date is agreed, which will not be realistically practicable.

10 To address questions raised by some delegations at MEPC 78 as to whether the suggested adoption of a "net" zero target might imply the use of out-of-sector offsets by the international shipping sector (i.e. the purchase of emissions reductions/allowances from other sectors) to achieve any mid-century target that may be agreed for the reduction of emissions by the sector, ICS wishes to clarify that it does not envisage the use of out-of-sector carbon offsets to achieve the level of ambition that it wishes the Organization to adopt.

11 The use of the term "net zero" simply refers to the reality that it will not be practicable for shipping to achieve zero absolute emissions on a tank-to-wake basis. The use of the term "net" simply refers to the use of alternative fuels or technologies whereby the emissions from international shipping are calculated as zero when account is taken of the carbon lifecycle assessment (LCA) of these fuels, issues which will be clarified by the separate workstream to develop IMO LCA guidelines.

12 For example, if an absolute zero target was adopted, e.g. for the year 2050, it would not be possible for ships to use, for example, biofuels, methanol or synthetic fuels whereby CO<sub>2</sub> is still emitted but is dealt with by other means elsewhere within the carbon lifecycle to achieve net zero emissions (or carbon neutrality) in accordance with IPCC guidelines. The adoption of an absolute zero target would also rule out the use of other potential solutions for decarbonizing shipping such as carbon capture and storage (CCS) or CO<sub>2</sub> extraction from the atmosphere whether undertaken on board ships or ashore.

**A regulatory goal for 2028 (or 2026)**

13 In addition to setting levels of ambition for the reduction of GHG emissions, it is suggested that the Revised Strategy should also address the need for the Organization to set goals to ensure that the necessary supporting regulatory framework will be in place to address potential safety and environmental issues associated with the construction/conversion and operation of ships using alternative fuels, as well as any new training and competence standards that may be required for seafarers, for example, inter alia, via instruments such as the International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code) and by amendments to the STCW Convention.

14 As well as being necessary to enable the transition by the entire international shipping sector, the development of new regulations, including safety regulations overseen by the Maritime Safety Committee (MSC), is a matter of urgency to support first movers that are starting to order new ships using alternative fuels which currently lack a global regulatory framework for their use. In view of the technical complexity involved in developing such regulations, including the use of all types of alternative fuels that are currently anticipated, it is suggested that a date such as 2028 might be a realistic target date to have all of the necessary regulations and technical codes in place, although this should be decided in consultation with MSC. Noting that some ships are already being designed, constructed and operated using alternative fuels, the Organization should make efforts to have the regulatory framework completed by 2026 if possible.

**Discussion****Levels of ambition**

15 ICS suggests that the text in the sub-paragraphs of section 3.1 of the Initial Strategy is revised as follows (deleted text ~~striktthrough~~, additional text underlined):

***".1 carbon intensity of the ship to decline through implementation of further phases of the energy efficiency design index (EEDI) for new ships***

to review with the aim to strengthen the energy efficiency design requirements for ships with the percentage improvement for each phase to be determined for each ship type, as appropriate;

***.1bis carbon intensity of the ship to decline through implementation of technical and operational measures for ships***

to review with the aim to strengthen the energy efficiency requirements for ships, in combination with any other standards that might be adopted;

***.2 carbon intensity of international shipping to decline***

to reduce CO<sub>2</sub> emissions per transport work, as an average across international shipping, by at least 40% by 2030 compared to 2008, pursuing efforts towards 70% net zero CO<sub>2</sub> emissions by 2050, ~~compared to 2008~~; and

**.3 GHG emissions from international shipping to peak and decline**

to peak GHG emissions from international shipping as soon as possible, pursuing efforts to reduce the total annual GHG CO<sub>2</sub> emissions to net zero by at least 50% by 2050, also pursuing efforts towards net zero GHG emissions compared to 2008, as soon as possible as called for in the Vision as a point on a pathway of CO<sub>2</sub> emissions reduction consistent with the Paris Agreement temperature goals including the aim to limit the temperature increase to 1.5°C;

**.4 energy used by international shipping produced from alternative fuels to increase**

to comprise at least 5% of the total energy used on board ships, as an average across international shipping, by 2030; and

**.5 regulatory framework to be adopted by the Organization**

to address safety, environmental and seafarers' training issues associated with the construction/conversion and operation of ships using alternative fuels by 2028.

16 The rationale for these suggested adjustments to the Initial Strategy is as follows:

- .1 The suggested addition of sub-paragraph 3.1.1bis takes account of the amendments to MARPOL Annex VI adopted at MEPC 76 to improve the carbon intensity of the existing fleet, which enter into force in November 2022, whilst leaving open the possibility of the introduction of other standards that might be adopted by the Committee, including any standards that may be developed, as mid-term measures, subject to progress made on this issue by MEPC 80;
- .2 The suggested changes to sub-paragraph 3.1.2 reflect:
  - .1 ICS support for the adoption by the Organization of a target signalling a high level of ambition for 2050 whilst noting that achievement of such an ambitious target will only be plausible if Technology Readiness Levels are sufficiently increased and that adequate quantities of low- or net zero-carbon fuels are made available in all ports worldwide. (The importance of adopting a "net" zero target rather than an "absolute" zero target is discussed with regard to the suggested changes to sub-paragraph 3.1.3 of the Initial Strategy below, as well as in paragraphs 9 to 12 above.);
  - .2 that with regard to the level of ambition for carbon intensity which applies to the existing fleet, ICS considers it premature to revise this for 2030 or for any year after 2030 (other than 2050) until after the CII reduction rates for 2027 to 2030 have been established following the review to be completed by 2026, as agreed at MEPC 76. Given that any further significant reduction of carbon intensity to be achieved after 2030, as an average across the global fleet, will primarily depend on the availability and deployment of low- and net zero-carbon technologies and fuels, the issues raised in document MEPC 77/7/22 (ICS) with respect to the measures that

will need to be adopted by the Organization will be equally relevant, especially given the decision by MEPC 78 not to proceed with the development of the IMRF/B; and

- .3 that the 2008 baseline should be retained, where relevant, for all of the 2030 levels of ambition, otherwise there will not be any continuity with respect to measurement of progress.
- .3 The suggested changes to sub-paragraph 3.1.3 reflect:
  - .1 ICS support for an ambitious net zero reduction target for 2050 which is considerably more ambitious than the current target of halving the sector's total GHG emissions by 2050, and support for the need for the Revised Strategy to address the phase-out of other GHG emissions too, whilst acknowledging that the practicability of phasing-out all GHG emissions by 2050 requires additional consideration;
  - .2 that UNFCCC<sup>2</sup> and IPCC<sup>3</sup> place particular emphasis on the global economy aiming to achieve net zero carbon emissions "in the coming decades";
  - .3 according to the IPCC glossary of terms "*net zero CO<sub>2</sub> emissions are also referred to as carbon neutrality*";<sup>4</sup> and the terms "net zero" and "carbon neutral" are more or less synonymous;
  - .4 the current IPCC definition of net zero is as follows: "*net zero CO<sub>2</sub> emissions are achieved when anthropogenic CO<sub>2</sub> emissions are balanced globally by anthropogenic CO<sub>2</sub> removals over a specified period*";
  - .5 use of the terms "net zero" (or "carbon neutrality") or "net zero emission fuels" would leave open the possibility of using a wider range of alternative fuels and, should this be technologically feasible, deploying other technologies such as carbon capture and storage (CCS) and direct carbon capture from the atmosphere;
  - .6 notwithstanding questions relating to the potential desirability and use of other measures, the term "net zero CO<sub>2</sub>" (or "carbon neutrality") could leave open the possibility for IMO to consider exploring such measures should it subsequently decide to do so, in addition to leaving the Organization with greater flexibility depending on the decisions it might take with respect, inter alia, to carbon lifecycle analysis; and
  - .7 following the outcome of COP 26, a reference to the 1.5-degree temperature goal should no longer be controversial.

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<sup>2</sup> <https://unfccc.int/climate-action/race-to-zero-campaign>

<sup>3</sup> [https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC\\_AR6\\_WGI\\_Headline\\_Statements.pdf](https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Headline_Statements.pdf)

<sup>4</sup> <https://www.ipcc.ch/sr15/chapter/glossary/>

- .4 The suggested additional sub-paragraph 3.1.4 reflects:
- .1 the need to provide a clear signal to energy producers and ship operators, so as to encourage investment, that the availability of alternative low and net zero emission fuels (however these might be defined by the Organization) will reach a "take-off" point in 2030 on a pathway to full decarbonization by 2050 (or whichever mid-century target may be agreed);
  - .2 the need to signal to other sectors of the global economy, and the Government departments with oversight of these sectors, which in effect are in "competition" with maritime transport for access to these new fuels, that the decarbonization of the global economy will require international shipping to have access to these fuels immediately;
  - .3 the need to provide impetus to the development of mid-term measures that will incentivize and expedite the development and uptake of new fuels;
  - .4 the need to enable, in the context of an economic measure, a calculation to be made of the funding that will be required to support, inter alia, a rewards programme to incentivize the uptake of eligible alternative fuels by narrowing the price gap with conventional fuel oil; and
  - .5 that ICS has suggested an interim target of, for example, 5% of the total energy used by international shipping in 2030 to be produced from alternative fuels as a figure which, whilst ambitious, may be considered to be realistic, taking account of current Technology Readiness Levels and the competition which shipping faces from other sectors of the economy for access to these new fuels.
- .5 The suggested additional sub-paragraph 3.1.5 reflects:
- .1 the need to ensure that the relevant IMO committees and sub-committees have plans in place to ensure that the necessary regulations to support the transition to low- and net zero-CO<sub>2</sub> emission fuels will be adopted as soon as possible and no later than 2028, including, inter alia, the SOLAS Convention, the IGF Code, MARPOL and the STCW Convention, bearing in mind that ships are now already being designed, constructed or converted which will operate on alternative fuels.

### ***Other suggested changes***

17 To assist the Committee, ICS suggests a number of other changes to the text to be included in the Revised Strategy, which are set out in the annex to this document. The reason for many of these suggested changes is for clarification and/or to reflect developments since the Initial Strategy was adopted, but also, inter alia, to give emphasis to the important role of an economic measure in expediting the take-up of net zero-emission fuels and technologies, as well as the importance, inter alia, of the IMO GHG TC-Trust Fund to support implementation of the Revised Strategy in developing countries, in particular LDCs and SIDS.

**Conclusion**

18 In view of the limited time available, it is suggested that the Committee can complete its task of developing an ambitious Revised Strategy, consistent with the 1.5-degree climate goal, which includes a net zero target for 2050, by making a relatively small number of changes to the text of the current Initial Strategy. The proposed amendments set out in the annex to this document might therefore be used by the Group, amongst other documents, to help facilitate this important work.

19 The additional interim target suggested for, for example, 5% of the energy used by international shipping in 2030 to be produced from alternative fuels will establish a "take-off" point on a pathway to complete decarbonization whilst giving impetus to the successful development of mid-term GHG reduction measures.

20 The net zero target proposed by ICS does not imply the use of out-of-sector offsets, but is a recognition that the achievement of absolute zero emissions, mid-century, by international shipping will not be practicable and would rule out a number of potential pathways to complete decarbonization.

21 The development of relevant technologies, alternative fuels, propulsion systems and related infrastructure required to achieve such an increased level of ambition will be the responsibility and in the control of stakeholders other than shipowners. ICS therefore suggests that the Organization should commission appropriate research to demonstrate how, for shipping, the pathway to net zero emissions by 2050 can realistically be achieved.

**Action requested of the Working Group**

22 The Group is invited to consider the proposals set out in this document and annex and to take action as appropriate.

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ANNEX

**SUGGESTED CHANGES TO THE  
INITIAL IMO STRATEGY ON REDUCTION OF GHG EMISSIONS FROM SHIPS**  
(deleted text ~~strikethrough~~, additional text underlined)

**3 LEVELS OF AMBITION AND GUIDING PRINCIPLES**

**Levels of ambition**

3.1 Subject to amendment depending on reviews to be conducted by the Organization, the ~~Initial~~ Revised Strategy identifies levels of ambition for the international shipping sector noting that technological innovation and the global introduction of alternative fuels and/or energy sources for international shipping will be integral to achieve the overall ambition. The reviews should take into account updated emission estimates, emissions reduction options for international shipping, and the reports of the Intergovernmental Panel on Climate Change (IPCC), as relevant. Levels of ambition directing the ~~Initial~~ Revised Strategy are as follows:

**.1 *carbon intensity of the ship to decline through implementation of further phases of the energy efficiency design index (EEDI) for new ships***

to review with the aim to strengthen the energy efficiency design requirements for ships with the percentage improvement for each phase to be determined for each ship type, as appropriate;

**.1bis *carbon intensity of the ship to decline through implementation of technical and operational measures for ships***

to review with the aim to strengthen the energy efficiency requirements for ships, in combination with any other standards that might be adopted;

**.2 *carbon intensity of international shipping to decline***

to reduce CO<sub>2</sub> emissions per transport work, as an average across international shipping, by at least 40% by 2030 compared to 2008, pursuing efforts towards ~~70% net zero CO<sub>2</sub> emissions by 2050, compared to 2008;~~ and

**.3 *GHG emissions from international shipping to peak and decline***

to peak GHG emissions from international shipping as soon as possible, pursuing efforts to reduce the total annual-GHG CO<sub>2</sub> emissions to net zero by at least 50% by 2050, also pursuing efforts towards net zero GHG emissions compared to 2008, as soon as possible as called for in the Vision as a point on a pathway of CO<sub>2</sub> emissions reduction consistent with the Paris Agreement temperature goals including the aim to limit the temperature increase to 1.5°C;

**.4 *energy used by international shipping produced from alternative fuels to increase***

to comprise at least 5% of the total energy used on board ships, as an average across international shipping, by 2030; and

**.5 regulatory framework to be adopted by the Organization**

to address safety, environmental and seafarers' training issues associated with the construction/conversion and operation of ships using alternative fuels by 2028.

**Guiding principles**

3.2 The principles guiding the ~~Initial~~ Revised Strategy include:

- .1 the need to be cognizant of the principles enshrined in instruments already developed, such as:
  - .1 the principle of non-discrimination and the principle of no more favourable treatment, enshrined in MARPOL and other IMO conventions; and
  - .2 the principle of common but differentiated responsibilities and respective capabilities, in the light of different national circumstances, enshrined in the UNFCCC, its Kyoto Protocol and the Paris Agreement;
- .2 the requirement for all ships to give full and complete effect, regardless of flag, to implementing mandatory measures to ensure the effective implementation of this strategy;
- .3 the need to consider the impacts of measures on States, including developing countries, in particular, on LDCs and SIDS as noted by MEPC 68 (MEPC 68/21, paragraphs 4.18 to 4.19) and their specific emerging needs, as recognized in the Organization's Strategic Plan (resolution A.1110(30)); and
- .4 the need for evidence-based decision-making balanced with the precautionary approach as set out in resolution MEPC.67(37).

**4 LIST OF CANDIDATE SHORT-, MID- AND LONG-TERM FURTHER MEASURES WITH POSSIBLE TIMELINES AND THEIR IMPACTS ON STATES**

**Timelines**

4.1 Candidate measures set out in this ~~Initial~~ Revised Strategy should be consistent with the following timelines:

- .1 short-term measures could be measures listed in the Initial Strategy (resolution MEPC.304(72)) finalized and agreed by the Committee between 2018 and 2023 or, if not yet finalized and agreed, as soon as possible after 2023. Dates of entry into force and when the measure can effectively start to reduce GHG emissions would be defined for each measure individually;

- .2 mid-term measures could be measures finalized and agreed by the Committee between 2023 and 2030. Dates of entry into force could be sooner than 2030 and when the measure can effectively start to reduce GHG emissions would be defined for each measure individually; and
- .3 possible long-term measures could be measures finalized and agreed by the Committee beyond 2030. Dates of entry into force and when the measure can effectively start to reduce GHG emissions would be defined for each measure individually.

4.2 In aiming for early action, the timeline for short-term measures should prioritize potential early measures that the Organization could develop, while recognizing those already adopted, including MARPOL Annex VI requirements relevant for climate change, as well as those already under consideration and not yet finalized, with a view to achieve further reduction of GHG emissions from international shipping ~~before~~ between 2023 and 2030.

~~4.3 Certain mid- and long-term measures will require work to commence prior to 2023.~~

4.43 These timelines should be revised as appropriate as additional information becomes available.

4.54 Short-, mid- and long-term further measures to be included in the Revised IMO GHG Strategy should be accompanied by implementation schedules.

4.65 The list of candidate measures is non-exhaustive and is without prejudice to measures the Organization may further consider and adopt.

#### **Candidate short-term measures**

4.76 Measures can be categorized as those the effect of which is to directly reduce GHG emissions from ships and those which support action to reduce GHG emissions from ships. All the ~~following~~ candidate measures listed in the Initial Strategy (resolution MEPC.304(72)) represent possible short-term further action of the Organization on matters related to the reduction of GHG emissions from ships.

*[NB: it is suggested that the short terms measures listed in the Initial Strategy need not be repeated in the Revised Strategy, as these covered by the adjustments to paragraph 4.7 above.]*

#### **Candidate mid-term measures**

4.87 Measures can be categorized as those the effect of which is to directly reduce GHG emissions from ships and those which support action to reduce GHG emissions from ships. All the following candidate measures represent possible mid-term further action of the Organization on matters related to the reduction of GHG emissions from ships:

- .1 implementation programme for the effective uptake of alternative low- and net zero-carbon fuels, including update of national actions plans to specifically consider such fuels;
- .2 operational energy efficiency measures for both new and existing ships including indicators in line with three-step approach that can be utilized to indicate and enhance the energy efficiency performance of ships;

- .3 new/innovative emission reduction mechanism(s), possibly including appropriate economic measures ~~Market-based Measures (MBMs)~~, to incentivize GHG emission reduction and expedite take-up of net zero-carbon fuels and technologies;
- .4 further continue and enhance technical cooperation and capacity-building activities such as under the ITCP and the IMO GHG TC-Trust Fund; and
- .5 development of a feedback mechanism to enable lessons learned on implementation of measures to be collated and shared through a possible information exchange on best practice.

### **Candidate long-term measures**

4.98 All the following candidate measures represent possible long-term further action of the Organization on matters related to the reduction of GHG emissions from ships:

- .1 pursue the development and provision of net zero-carbon or fossil-free fuels to enable the shipping sector to assess and consider decarbonization in the second half of the century; and
- .2 encourage and facilitate the general adoption of other possible new/innovative emission reduction mechanism(s).

### **Impacts on States**

4.409 The impacts on States of a measure should be assessed and taken into account as appropriate before adoption of the measure. Particular attention should be paid to the needs of developing countries, especially small island developing States (SIDS) and least developed countries (LDCs).

4.410 When assessing impacts on States the impact of a measure should be considered, as appropriate, inter alia, in the following terms:

- .1 geographic remoteness of and connectivity to main markets;
- .2 cargo value and type;
- .3 transport dependency;
- .4 transport costs;
- .5 food security;
- .6 disaster response;
- .7 cost-effectiveness; and
- .8 socio-economic progress and development.

4.421 The specification for an agreement on the procedure for assessing and taking into account the impacts of measures related to international shipping on States should be undertaken as a matter of urgency as part of the follow-up actions.

4.43<sup>12</sup> Disproportionately negative impacts should be assessed and addressed, as appropriate.

## **5 BARRIERS AND SUPPORTIVE MEASURES; CAPACITY-BUILDING AND TECHNICAL COOPERATION; R&D**

5.1 The Committee recognizes that developing countries, in particular the LDCs and SIDS, have special needs with regard to capacity building and technical cooperation.

5.2 The Committee acknowledges that development and making globally available new energy sources that are safe for ships could be a specific barrier to the implementation of possible measures.

5.3 The Committee could assist the efforts to promote low-carbon technologies by facilitating public-private partnerships and information exchange.

5.4 The Committee should continue to provide mechanisms for facilitating information sharing, technology transfer, capacity-building and technical cooperation, taking into account resolution MEPC.229(65) on Promotion of technical co-operation and transfer of technology relating to the improvement of energy efficiency of ships.

5.5 The Organization is requested to assess periodically the provision of financial and technological resources and capacity-building to implement the Strategy through the ITCP, the GHG TC-Trust Fund and other initiatives including the GLEEMEP GreenVoyage2050, IMO CARES and GHG-SMART projects and the MTCC network.

## **6 FOLLOW-UP ACTIONS TOWARDS THE DEVELOPMENT OF THE REVISED STRATEGY**

6.1 A programme of follow-up actions of the ~~Initial~~ Revised Strategy should be developed.

~~6.2 [Deleted]~~

6.3<sup>2</sup> The Marginal Abatement Cost Curve (MACC) for each measure, as appropriate, should be ascertained and updated, and then evaluated on a regular basis.

## **7 PERIODIC REVIEW OF THE STRATEGY**

~~7.1 The Revised Strategy is to be adopted in spring 2023.~~

7.2<sup>1</sup> The Revised Strategy should be subject to a review five years after its final adoption.

7.3<sup>2</sup> The Committee should undertake the review including defining the scope of the review and its terms of reference.

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