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NOTE

From:	General Secretariat of the Council
To:	Delegations
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Subject:	Draft submission by Member States and the Commission to the International Maritime Organisation's (IMO) 13th Intersessional Working Group on Reduction of GHG Emissions from Ships on the further development of the proposal for a GHG Fuel Standard

In view of the Shipping Working Party meeting on 17 October 2022, delegations will find attached a Presidency compromise proposal.

Changes compared to the Commission proposal are indicated in **bold underline** (new text) and ~~strikethrough~~ (deleted text).

General scrutiny reservation: all delegations.

Deadline for transmission to IMO: **21 October 2022**.

INTERSESSIONAL MEETING OF THE
WORKING GROUP ON REDUCTION OF
GHG EMISSIONS FROM SHIPS
13th session
Agenda item 4

ISWG-GHG 13/4/YY
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DERATION OF A BASKET OF CANDIDATE MID-TERM MEASURES IN THE CONTEXT OF PHASE II OF THE WORK PLAN FOR THE DEVELOPMENT OF MID- AND LONG-TERM MEASURES

Further development of the proposal for a GHG Fuel Standard

Submitted by Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the European Commission~~, acting jointly in the interest of the European Union~~

SUMMARY

Executive summary:	This document presents an elaborated and amended proposal for a GHG Fuel Standard (GFS) as a mid-term measure to address GHG emissions from international shipping. The GFS provides certainty to shipping companies and fuel producers and ensures that low- and zero-GHG fuels will become available. The proposed voluntary flexibility mechanism "Surplus Reward System" rewards first movers and allows at the same time ships that cannot sail on low-GHG fuels to continue to operate. The document explicitly addresses issues raised during ISWG-GHG 12.
Strategic direction, if applicable:	3
Output:	3.2
Action to be taken:	Paragraph 52
Related documents:	ISWG-GHG 10/5/3, ISWG-GHG 10/5/6, ISWG-GHG 12/3/3, ISWG-GHG 12/3/4, MEPC 75/INF.5

Introduction

1 MEPC 76 adopted the Work plan for the development of mid- and long-term measures. MEPC 78 decided that Phase I of the Work plan had been concluded and that Phase II should further develop a "basket of candidate mid-term measures". Phase II entails an assessment of the proposed measures, in particular their feasibility, their effectiveness to deliver the long-term levels of ambition of the IMO Initial Strategy on the reduction of GHG emissions from ships and their potential impacts on States.

2 ISWG-GHG 12/3/3 by Austria et al. proposed the Greenhouse Gas Fuel Standard (GFS) as a goal-based technical measure which would provide long-term certainty towards shipping companies and fuel producers alike and help ensure that the demand for low- and zero-GHG fuels from the shipping sector will increase and GHG emissions are consequently reduced. The corresponding initial impact assessment can be found in ISWG-GHG 12/3/4. The Working Group considered the GFS, which was generally welcomed as an important element of a future basket of measures. Several delegations also raised questions on elements of the proposal.

3 The co-sponsors have further elaborated the proposal for a GFS for Phase II of the work plan, taking into account the comments received during ISWG-GHG 12. This submission first presents key elements of the GFS in more detail, and then replies to comments raised during ISWG-GHG 12. More information on the implementation of the GFS and the necessary legal framework for an entire GFS Cycle are included in Annex I. A proposed GFS cycle timeline is included in Annex II. An illustrative tree of the respective actions of each actor involved during the GFS Cycle is included in Annex III. Specific questions on the combination of the GFS with a market-based measure are addressed in submission ISWG-GHG [13/X/X]. In accordance with the conclusions of MEPC 78, the comments have been categorised under the headings of Phase II: feasibility, effectiveness to deliver the long-term levels of ambition of the IMO GHG Strategy and potential impacts on States.

The Greenhouse Gas Fuel Standard

4 The GFS is a goal-based technical measure aimed at reducing the GHG intensity of the energy used on-board ships. The standard can be met by different fuel types and blends and the GFS does not prescribe or favour the use of specific fuel types so it is technology-neutral. Sources of energy other than liquid and gaseous fuels, like on-shore power supply (OPS) could be taken into account. As regards to energy provided by wind propulsion technologies on-board, the co-sponsors propose to assess, during the further development of the GFS, how such energy could be included in the framework. This work could build upon the knowledge acquired through to ongoing facilitation projects in this field, as those mentioned in document MEPC [79/INF.xx].

5 The GFS would require all ships above a certain size limit, e.g. 400 GT or 5.000 GT, to limit the Well-to-Wake (WtW) GHG intensity of energy used on board at or below a certain limit value over an annual compliance period. The GFS will follow a predetermined pathway and will be reduced every one, three or five years, in order to provide certainty to the market about the demand for fuels. The reduction targets of the GFS would take into account the average GHG intensity of the marine fuels currently used globally as well as the decrease in GHG intensity needed to achieve the levels of ambition of the IMO GHG Strategy. As the availability of zero-GHG fuels is expected to be low initially, the GFS would be reduced by a small percentage in the first years. Over time, the reduction percentage would be increased. This would ensure a gradual and predictable phase-in of low- and zero-GHG fuels compatible with a trajectory towards the emission reduction level of ambition for 2050.

6 The average WtW GHG intensity of the energy used on board a ship during the compliance period is called the Greenhouse Gas Fuel Intensity (GFI). Both the GFS and the GFI are expressed in the mass of GHG emissions per unit of energy used on-board, e.g. gCO_{2e}/MJ.

7 The GFS would require a reference value in order to translate the relative reduction (a percentage) in an absolute limit value (g CO_2e/MJ). The reference value would correspond to the fleet average greenhouse gas intensity of the energy used on-board by ships for a given year, determined on the basis of data monitored and reported in DCS (for **e.g.** 2020).

8 The GFS would not impose a cap of absolute emissions on shipping activity. By regulating a decrease of the GHG intensity of the energy used on board, ships over time, it would contribute to ensuring that the levels of ambition of the IMO GHG Strategy, as revised, are met. While emissions may fluctuate in the short-term in response to business cycles or other causes, the long-term reduction of the GHG-intensity of energy used ensures that emissions decline rapidly as called for in the IMO GHG Strategy.

Design of the Greenhouse Gas Fuel Standard (the GFS cycle)

9 The GFS **will follow a predetermined pathway and will be reduced every one, three or five years**~~can be defined either on an annual basis or on a periodical basis (e.g. by periods of three or five years)~~. The collection of data for the implementation of the GFS can be based on the current IMO DCS framework, including the SEEMP that could be amended for that purpose by updating SEEMP Part II and introducing a new SEEMP Part IV (together, the “updated SEEMP”). The additional data to be used and the process for amending the SEEMP accordingly are further elaborated in Annex I. The updated SEEMP will have to be submitted and assessed as compliant by the Administration ahead of the beginning of collection of data on energy consumption.

10 On the basis of the SEEMP, the GFS will require from each ship to monitor the annual amount of fuel consumed and energy used from other sources together with their GHG intensity, and collect the necessary underlying documentation to be used for verification of the attained GFI. The data above together with underlying documentation will be recorded in an annual report (GFS report) and reported to the Administration annually for verification. Following verification, a Statement of Compliance will be issued by the Administration for each reporting period. In submitting the annual GFS report to the Administration, the collected data should be reported in a form that would allow the verification of compliance with the applicable GFS limit. The collection and verification procedure of the annually attained GFI is further elaborated in Annex I.

11 All monitoring and activity data as well as documentation including assumptions, references, emission factors, Bunker Delivery Notes (BDNs), fuel certificates and other pertinent information shall be kept by the ship for a period of five years from the time of submission of the GFS report to the Administration. It is proposed that a five-year retention obligation is inserted as a minimum. When selecting fuels and other energy options to be used on-board ships, ships should

take into account their GHG intensity with a view to meeting the applicable GFS limit for the compliance period. These considerations are further elaborated in Annex I.

Voluntary flexibility mechanism to foster innovation, reward first movers, and maintain the level playing field

12 The GFS as proposed in this submission gives ships the **voluntary** option to participate in the Surplus Reward System, a flexibility mechanism designed to promote innovation, award first movers and maintain a level playing field. It also provides for additional compliance options to ships that have occasionally not reached the required standard and thus minimises the risk of disruptions in maritime trade. It provides flexibility to all those ships lacking availability of options for compliance, either due to technology incompatibility or temporary non-availability of low GHG intensity fuels or energy options.

13 One reason to introduce this flexibility mechanism is that the initial gradual reduction of the GFS introduces a risk that the industry will comply by using or blending fuels with a marginally lower GHG intensity compared to conventional fuels, which are expected to be cheaper than zero-GHG fuels but do not offer a pathway to reduce significantly the GHG intensity of the energy used on-board ships. In order to mitigate this risk, the Surplus Reward System includes clear and predictable incentives for first movers towards the best performing fuels in terms of GHG intensity, including zero-GHG fuels. This is an essential prerequisite for the **early** build-up of production capacity and bunkering infrastructure for these fuels.

14 A second reason for introducing the Surplus Reward System is that some ships may occasionally encounter difficulties to find appropriate fuels to comply, especially in the first years of implementation of the GFS. In order to ensure that all ships contribute to the fuel transition, and that there is no unfair commercial advantage for non-compliant ships, the Surplus Reward System is designed to even out the costs of decarbonisation across all ships that opt for participating in this flexibility mechanism. At the same time, the Surplus Reward System allows continued operation of ships, which, for whatever reason, cannot operate on low- and zero-GHG fuels.

15 The Surplus Reward System is presented in more detail below. It offers flexibility while also ensuring that the goals of the GFS are achieved so that the process of decarbonisation is not delayed. It is a ship-based system, which allows both Administrations and Port States to unequivocally determine the compliance status of individual ships.

Design of the Surplus Reward System

16 When ships have attained a GFI lower than the required GFS, they can opt to participate in the Surplus Reward System, together with submission of their annual GFS report for verification, in order to be granted Surplus Reward Units (SRUs). The amount of SRUs, expressed in CO_2e emissions, is equal to the difference between the attained absolute GHG emissions of the ship and the hypothetical emissions which the ship would have had if it had just met the required GFS limit, taking into account the total amount of energy used during the compliance period.[1]

17 The SRUs are stored in a central global registry, the GHG Fuel Standard Registry (GFS Registry) which tracks their ownership and existence. The GFS registry should operate on robust IT systems and procedures to avoid the risk of unauthorized or unfounded transactions. The GFS Registry would need to have the capacity to register the ownership of SRUs, store SRUs in a secure way, create SRUs in the accounts of ships and to annul them, and offer companies the possibility to check the amount of SRUs in their ships' accounts and to transfer them to another ship account upon their request, as the legitimate owner of the SRUs. The GFS Registry is not a marketplace and the SRUs are not expressed in monetary terms, leaving flexibility to the shipping companies to facilitate their exchange as appropriate. The GFS Registry would operate under the auspices of the IMO.

18 When ships use fuels that have a higher GFI than the GFS, they can receive a Statement of Compliance from their Administration only under the condition that they hand in a sufficient number of SRUs to make up for their shortfall.[2] The SRUs can be transferred between ships of the same company or ships of different companies and they could have longer or shorter period of validity. SRUs can only be used once.

19 Provided the number of SRUs handed in by ships with a GFI higher than required GFS limit is smaller than or equal to the number of SRUs created by ships with a lower GFI than the required GFS limit, the environmental integrity of the system is guaranteed. The emission reductions will be at least as large as when all ships had opted to comply by using fuels with a total attained average GHG intensity limit that is below the applicable GFS limit.

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1 So for example, if a ship has used 400 TJ of fuels with a GFI of 10 g CO_2e/MJ, at a time when the required GFS is 50 g CO_2e/MJ, it would be granted $400 \times 10^6 \times (50\text{-}10) / 10^6 = 16{,}000$ SRUs, each SRU representing one tonne of CO_2e.

2 So for example, if a ship has used 400 TJ of fuels with a GFI of 80 g CO_2e/MJ, at a time when the required GFS is 50 g CO_2e/MJ, it would need to hand in $400 \times 10^6 \times (80\text{-}50) / 10^6 = 12{,}000$ SRUs, each SRU representing one tonne of CO_2e.

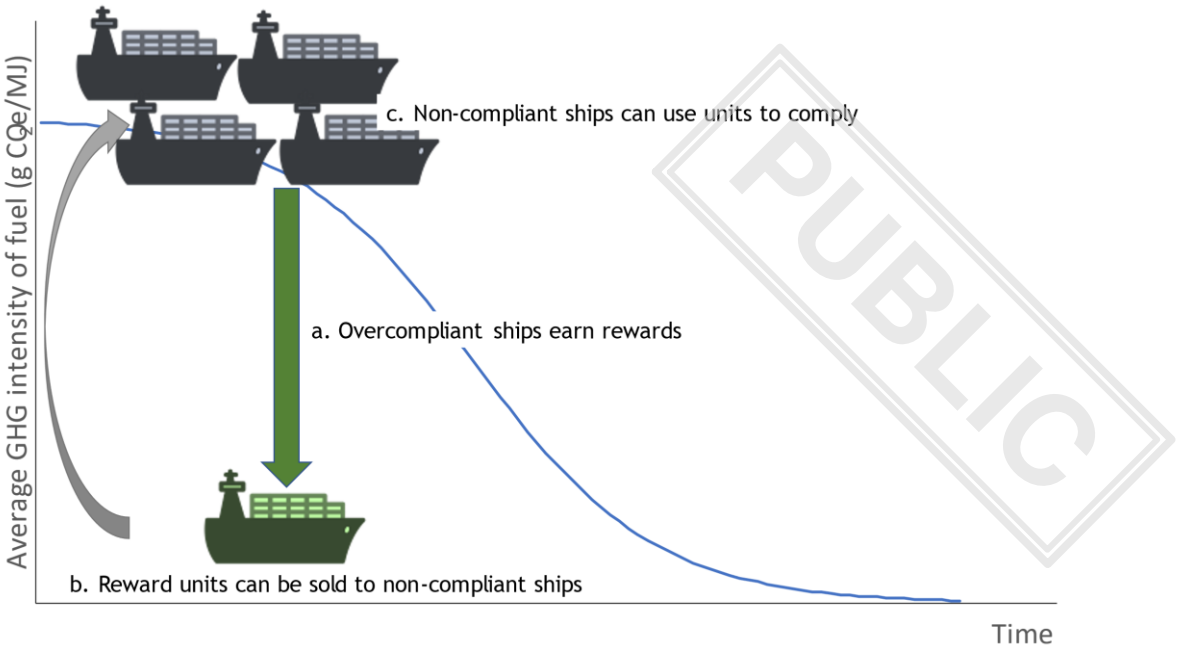

Figure 2 - Surplus Reward System

Remedial action

20 During the first years of existence of the system, ships will build up experience with how the system works. To reduce the risk of a disruption of maritime trade, during this period, the GFS Registry could be allowed to generate and provide GFS Remedial Units (GRUs) at a price that is dissuasive of non-compliance and therefore higher than the marginal costs of compliance. GRUs can only be used once.

21 Revenues collected from the payment of GRUs could be used by IMO to support projects or initiatives enhancing the climate transition of shipping, in particular in SIDS and LDCs. The modalities of such use could be further considered, possibly in conjunction with other revenues stemming from other mid-term measures.

Options for compliance with the GFS

22 Thus, ships would have a number of options to comply with the GFS:

.1 use fuels that are below the GFS. Initially, such fuels would likely consist of blends of liquid or gaseous biofuels or synthetic fuels with fossil fuels;

.2 use low- or zero-GHG fuels in one or several engines or boilers and conventional fuels in other engines, so that the GFI is equal to or lower than the GFS;

.3 use shore power electricity with a low GHG intensity stored in a battery in addition to the use of conventional fuels, so that the GFI is equal to or lower than the GFS;

.4 alternate in time between the use of low- and zero-GHG fuels and conventional fuels, e.g. using over-compliant fuels when perhaps more available at certain locations and conventional fuels when bunkering in ports where such fuels are not supplied, so that the GFI is equal to or lower than the GFS; and

.5 participate in the Surplus Reward System.

.6 purchase GRUS at a price that is dissuasive of non-compliance.

Governance of the Greenhouse Gas Fuel Standard

23 As also illustrated in Annex III, The GFS would require ships to:

.1 submit an updated SEEMP to be assessed as compliant by the Administration ahead of the

beginning of collection of data on energy consumption;

.2 monitor during the entire compliance period (i.e. calendar year) the amount of fuel and energy sources consumed together with their GHG intensity;

.3 right after the end of each reporting period, calculate their attained GFI, based on relevant evidence and documentation and in accordance with the IMO guidelines on lifecycle GHG intensity of marine fuels[3];

.4 submit annually their GFS report and underlying documentation to the Administration; and

.5 in case the GFI is above the applicable GFS limit, submit the corresponding SRUs or GRUs to the GFS Registry.

24 The obligations for the Administration or any other organization authorized by the Administration are to:

.1 assess the compliance of the updated SEEMP before the first reporting period of the GFS;

.2 verify the GFS report, i.e. assess the reliability, credibility, accuracy and completeness of the data and information provided as a basis for the calculation of the attained GFI, and verify the calculation of the attained GFI for each ship, based on their updated SEEMP and in accordance with guidelines to be developed by the Organization.

.3 issue a Statement of Compliance to ships when the GFI is not more than the required GFS limit for that reporting period.

.4 issue a Statement of Compliance to ships when the attained GFI is equal or above the required GFS limit for that reporting period, provided that the ship has handed over a sufficient amount of SRUs or a proof of payment for a sufficient amount of GRUs issued by the Registry.

.5 record the actions listed above in the GFS Registry.

25 Port States would have the right to:

.1 check and verify the GFS Statement of Compliance. A similar process can be found related to the use of electronic certificates where there should be specific instructions on-board on how to verify the validity of such certificates online (see FAL.5/Circ.39/Rev.2 and Corr.1); and

.2 take action in case the Statement of Compliance is incomplete or invalid, as appropriate.

26 The GFS Registry would:

.1 record the compliance status of each ship on the basis of the verified GFS report;

.2 maintain a database of Surplus Reward Units, containing, for each SRU, at least the company and the IMO number of the ship.

.3 create, upon request of the company of each individual ship, SRUs to be credited to each ship's account;

.4 transfer SRUs to other ships, upon request of the company who is the legitimate owner of the SRUs.

[3] as currently in the development and due for adoption by MEPC 80.

.5 annul, upon request of the company of each individual ship, SRUs used for compliance by ships that have attained a GFI in excess of the applicable GFS limit. If GRUs are used as a remedial action, proof of payment thereof by the ship needs to be submitted to the GFS Registry before they are annulled.

Benefits of the voluntary Surplus Reward System

27 A GFS with a Surplus Reward System has several benefits compared to a GFS without it. First of all, overcompliance is rewarded. This means that ships that invest in long-term solutions like zero-GHG fuels, can earn a share of their investment back by selling SRUs to non-compliant ships. As a result, the system incentivises the development of long-term solutions from the start and prevents a prolonged dependence on fuels that are only marginally better than conventional fuels. In terms of rewarding the first movers and incentivising the uptake of low- and zero-GHG fuels, the Surplus Reward System has similar objective to a feebate system as proposed for example by co-sponsors of ISWG-GHG 12/3/7 and ISWG-GHG 12/3/9. The main difference between the two systems is that the feebate system requires regulators to set the level of the fee and of the rebate, whereas in the Surplus Reward System, the value of SRUs is determined by private operators and the corresponding supply and demand.

28 The second benefit of the Surplus Reward System is to allow ships that cannot sail on low- or zero-GHG fuels to continue sailing under compliance with the GFS by using SRUs to make up for its excess emissions, without undermining the environmental integrity of the GFS or allowing a competitive advantage to non-compliant ships. This is the case for example when the ship is not able to source compliant fuels in any of the ports it enters, or when an existing ship is technically constrained with respect to the range of fuels it can use.

29 The third benefit of a GFS with a Surplus Reward System is that the system does not favour shipping companies with large or conversely with small fleets. The option to participate is open to all ships on an individual ship basis. If there is sufficient supply and demand, it is likely that one or more market places will be set up, making it even easier to buy and sell SRUs. This aspect of the Surplus Reward System is similar to a feebate, with the main difference that no regulator is to be involved in that market place.

30 The GFS is clearly a technical measure which regulates the GHG intensity of energy used onboard, ships. The Surplus Reward System enhances the environmental effectiveness of the GFS, i.e. that our levels of ambitions are reached. At the same time, ships can comply with the GFS by using fuels and energy options allowing meeting the required GHG intensity and there is no obligation to participate in the Surplus Reward System.

Feasibility of the Greenhouse Gas Fuel Standard

31 This section addresses issues raised at ISWG-GHG 12 related to the feasibility of the GFS and its voluntary Surplus Reward System. Some of the issues are relevant for all measures aiming to start the transition towards low- and zero-GHG fuels. These relate to fuel availability and quality and safety of renewable maritime fuels. Others are specific to the GFS, like incentives for energy efficiency, wind-assisted propulsion and regulatory capacity needs.

32 The availability of low- and zero-GHG fuels is essential for the GFS and for other measures aiming to increase their use. Because these fuels are generally more expensive than non-compliant fuels, their use will be very low in the absence of policy measures providing regulatory certainty. In other words, policy measures are needed to ensure and enhance fuel availability. When a policy measure contributes to creating a certain demand for low- and zero-GHG fuels, investments in production capacity and bunkering infrastructure will follow. More detailed explanation in this respect can be found in ISWG-GHG 12/3/4, including the Initial impact assessment of the GFS.

33 At the time of introduction of the GFS, the market may not have sufficiently anticipated the increase in demand for fuels. However, there is sufficient evidence that enough low-GHG fuels are currently available to lower the GHG intensity of energy used onboard in a way compatible with a gradual emission reduction trajectory. In an initial phase, blending- of slightly lower GHG fuels will allow to meet mild initial targets. At a later stage in the coming years, as the production capacity for zero-GHG fuels~~, such as green ammonia,~~ expands, the opportunity to further decarbonise the energy used will allow to increase stringency levels. Furthermore, it is expected that new bunkering infrastructure developments (e.g. for ammonia in several ports in Europe, Asia and Oceania) will support the deployment of higher numbers and quantities of low- and zero-GHG fuels. In view of this, it will be possible to initiate the lowering of the average GHG intensity already in the next years and it is in particular necessary to signal our efforts towards fuel producers.

34 The safety and quality of low- and zero-GHG marine fuels needs to be assured, regardless of the measure chosen to increase their use. With regards to safety, IMO has established ways of regulating fuel safety which also can be used to develop regulation for low- and zero-GHG fuels. For example, liquefied gas, ammonia, hydrogen and methanol have flashpoints below 60ºC and are, or will be, covered by the International Code of Safety for Ships Using Gases ~~Or~~ **or** Other Low-Flashpoint Fuels (IGF Code). At the time of drafting this submission, IMO's Sub-Committee on Carriage of Cargoes and Containers (CCC) is dealing with the amendments to the IGF Code and development of guidelines for Low-Flashpoint Fuels.[4] The 13th Session of the Intersessional Meeting of the Working Group on Reduction of GHG Emissions from Ships will also discuss this subject.

35 For many low- and zero-GHG marine fuels, quality is expected to be more constant than for majority of the current fossil fuels because they are constituted of one chemical compound or a mix of a few compounds and impurities can be kept under control during the production process. This would likely be the case for synthetic fuels using renewable electricity to electrolyse hydrogen, produce ammonia, and liquid or gaseous hydrocarbons, such as methanol and methane. Others, like biofuels, may have a composition that depends on the feedstock and conversion process. Irrespective of this difference, fuel quality must be ensured in accordance to specific fuel quality standards and may require additional standardization work, eventually starting with the fuels that have been identified as priority fuels in the LCA guidelines. In this sense, standardization bodies have already started the revision, or development, of marine fuels standards, to include alternative fuels, for example ISO/CD 8216-1, ISO/CD 8217 or ISO/AWI 6583.

36 The uptake of low- and zero-GHG fuels at higher cost will also provide an additional incentive for improving the energy efficiency of ships: the more efficient a ship is designed or operated, the lower the cost increase will be. The payback period for energy efficiency improvements will become shorter. In that sense, there is a clear synergy between the short-term measures, primarily aiming to improve the energy efficiency of ships, and the GFS.

37 The regulatory capacity needs of the GFS corresponds to the existing type of organisational arrangements. Administrations would need to be capable to conduct, or to delegate under their responsibility, extensive verification and supervision activities, related in particular to the verification of the GFS report and the management of SRUs within the GFS Registry. Similar verification tasks are already carried out as part of the CII and DCS reporting requirements, with the rest being common to any future developments in terms of fuel/energy transition and the increased variety in the fuel mix used on**-**board ships. The regulatory capacity specific to the GFS would relate to the monitoring of ship's compliance and its participation in the voluntary flexibility mechanism, all supported by the central GFS Registry created for this purpose. More specifically,

[4] E.g. CCC 8/3 containing draft interim Guidelines for the safety of ships using hydrogen as fuel, CCC 8/13 development of guidelines for the safety of ships using ammonia as fuel, MSC.1/Circ.1621 interim Guidelines for the safety of ships using methyl/ethyl alcohol as fuel.

the Administration would reward SRUs to ships that choose to participate in the Surplus Reward System and to annul units turned in for compliance. For ships that choose not to participate in the Surplus Reward System, the Administration would enter the attained GFI in the Registry. These are all simple IT tasks.

Effectiveness to deliver the long-term levels of ambition of the IMO GHG Strategy

38 The long-term levels of ambition of the IMO GHG Strategy are formulated in terms of absolute GHG emission reductions and their pathway.[5] The GFS is expressed in terms of GHG intensity of fuels or energy used. The GFS can be translated in absolute emissions by multiplying the required GHG intensities with the projected energy use by shipping which is reported in the IMO GHG Studies. Hence, the GFS target can be set in such a way that it achieves the long-term levels of ambition of the Strategy **and intermediate checkpoints taking into account expected developments in transport work**. In reality, energy use may fluctuate around the projected value as a result of the business cycle and other factors which affect shipping activity in the short-term.

39 In the initial years, the required GFS would take into account the initial limited availability of low- and zero-GHG fuels, because there is a limit to the pace at which production capacity and the bunkering infrastructure can be ramped up. The longer-term targets can be set on the basis of a science-based environmental assessment and the need to adhere to a predictable emission reduction trajectory and the emission reduction objectives.

40 Because the GFS provides predictability to fuel producers, fuel suppliers and shipping companies that there will be a growing demand for low- and zero-GHG fuels, it reduces the risk associated with investments in production capacity, bunkering infrastructure and ships. The GFS thus creates a growing market for low- and zero-GHG fuels and ensures that these fuels will be available and used in the sector to meet the long-term levels of ambition of the IMO GHG Strategy.

41 It is possible that the actual energy use diverges from the projected value due ~~TO~~**to**, among others, changing volumes of shipping activity, and that emissions may therefore turn out to be higher than the adopted levels of stringency. Whether or not this is the case can be reviewed annually when the DCS report includes a section on the average GFI (which can be calculated from the GFI of individual ships and their fuel consumption). This will inform on a yearly basis the MEPC, which can **in case of very significant deviations** take action, as appropriate to ensure a steady and predictable emission reduction trajectory and review the GFS as appropriate.

42 In order to enhance IMO's contribution to the global effort of containing temperature increase to 1.5°C, it is essential that emissions of shipping decrease while at the same time measures do not result in an increase of emissions on shore. For this purpose, the GFS will necessarily have to be based on Well-to-Wake emissions of fuels, as defined by the LCA guidelines which are under development. In this way, the GFS will provide the right incentives to fuel producers right from the start.

43 It could be also considered to supplement the GFS with additional incentives for specific types of fuels, such as hydrogen-based fuels, taking into account that such ships have a different design than ships sailing on fuel oil, and sufficient time is needed to build up production capacity and bunkering infrastructure for these fuels and to build ships that can sail on them. Any incentive for specific types of fuels should take into consideration the need to ensure that the widest range of

[5] As formulated in the Vision: 'IMO remains committed to reducing GHG emissions from international shipping and, as a matter of urgency, aims to phase them out as soon as possible in this century'. And in Article 3.1.3: 'to peak GHG emissions from international shipping as soon as possible and to reduce the total annual GHG emissions by at least 50% by 2050 compared to 2008 whilst pursuing efforts towards phasing them out as called for in the Vision as a point on a pathway of CO_2 emissions reduction consistent with the Paris Agreement temperature goals.'

compliance options remain available to operators and that no constraints are created, in particular for existing ships which will necessarily implement blend-in strategies.

Potential impacts on States

44 The impacts on States of a GFS have been presented in the initial impact assessment in ISWG-GHG 12/3/4. This submission adds some further considerations to address questions raised in terms of impacts on countries that can produce low- and zero-GHG fuels at low costs benefitting from the increase in demand, while countries with high maritime transport costs are affected by their increase.

45 At ISWG-GHG 12, three additional aspects of the potential impacts on States have been raised: R&D needs; investment needs and their geographical distribution; and access to technology for developing countries.

46 The R&D needs of the GFS are no different from the R&D needs for achieving the goals of the IMO GHG Strategy with other measures; they are related to the fuel/energy transition rather than to any specific measure. The R&D needs for developing production processes will be mostly borne by other sectors. The reason is that many fuels currently considered for shipping are either base chemicals (methanol, methane, ammonia, hydrogen) or fuels for other sectors (bioliquids, methanol, hydrogen) or both. Shipping is expected to use a relatively small share of the global production of these compounds, in particular in the early years of implementation of the fuel transition.

47 The shipping sector can focus its R&D efforts on the use of fuels onboard ships: bunkering, onboard storage, conversion into useful energy. MEPC 75/INF.5 provides examples of areas that could be further developed, such as batteries, safe hydrogen engine rooms, ammonia cold start and 50 MW marine fuel cells. When there is a clear prospect for demand, private companies will normally be incentivised to undertake R&D in these areas.

48 The fuel/energy transition will require significant investments in fuel production capacity, bunkering infrastructure, and ships. Studies show that the investment in ship building will roughly double, but that over 80% of the investment is on-shore(/ land-based) in fuel production and bunkering infrastructure.[6] The total investments are estimated to add up to USD 1,5 - 2 trillion, while the timing of investments is correlated with the introduction of stringent targets. In general, investments precede the introduction of targets. The geographical distribution of the investments in ships are likely to be concentrated where shipping companies are located.

49 The GFS does not impact where ships are built, so it will not affect the current distribution. Investments in fuel production are likely to be concentrated in areas where fuels can be produced at the lowest costs, as shown in ISWG-GHG 12/3/5, which is where the profit margin for fuels will be highest. Investments in bunkering infrastructure are likely to be concentrated in major bunkering ports, at least initially. However, due to lower volumetric energy density of low- and zero-carbon fuels, bunkering may be more dispersed across the globe than it currently is and new major bunkering ports may emerge. Also, remote locations may need dedicated or upgraded bunkering infrastructure.

50 The co-sponsors do not expect that access to technology is a major obstacle to the fuel/energy transition. Most of the technology is available, technology readiness is the same across all countries and system integration of new technological components can be reasonably expected to allow for timely upscaling at commercial level, provided stable and predictable measures are adopted. Other technologies require further development, e.g. direct air capture, ship engines, fuel cells at MW scale. These technologies are generally developed by equipment manufacturers who

[6] UMAS. (2019). Aggregate Investment for the Decarbonisation of the Shipping Industry.

make a business of selling technologies and have no interest in reducing access to these technologies.

Conclusion

51 The GFS can ensure that the long-term targets for GHG reductions of the IMO GHG Strategy are met. An essential element of the GFS is the option for ships to participate in the flexibility mechanism, so that early movers ~~uptaking~~ **which take up the** best performing fuel options, including zero-GHG fuels are rewarded for their action, while ships that fail to reach the standard can continue to operate. The GFS is feasible to implement, it provides a clear outlook for the fuel/energy transition, new opportunities for all countries, in particular developing countries, as producers of the required low- and zero-GHG fuels, and it is designed to minimise the likelihood of disproportionate negative impacts. That is why the co-sponsors propose that in Phase II of the Work plan the GFS should be selected as a measure to further develop as a priority.

Action requested ~~by~~ of the Working Group

52 The Group is invited to consider the proposal and comments presented in this document and to take action as appropriate.

ANNEX I

The Table below introduces some initial considerations on the legal instruments that will need to be introduced in order to incorporate the GFS within the IMO legal framework. It includes the following fields:

1. "GFS Elements" groups together key stages of the GFS cycle.
2. "Amendment placeholder" refers to where the corresponding GFS Provisions could be placed within the IMO regulatory scheme (MARPOL or Guidelines).
3. "GFS Provisions" refers to the specific provisions proposed to be included in each GFS Element.

GFS Elements	Provisions	Amendment Placeholder
Scope and general requirements	**New Regulation 29** will include a description of the GFS cycle and setting out the obligations of involved actors, including: • Scope of application of the GFS • Required GFI (limit and reduction trajectory) • Data collection procedure for determining the GFI • Reporting requirements • Timeline for different actions within the GFS cycle	New Regulation 29 titled "Annual average GHG intensity of the energy used onboard"
Development of updated SEEMP	**Amendment of SEEMP Part II** to include GFS monitoring in the framework of "ship fuel consumption data", to the extent applicable. In addition, introduction of **new SEEMP Part IV** to include the additional information needed for monitoring the GFS energy consumption and supplementing updated SEEMP Part II, similarly to the structure followed for SEEMP Part III (CII). Amended SEEMP Part II to include: • Intended energy sources to be used on board. "Fuel" and "fuel oil" references should be amended to "energy sources" • A description of the procedures for monitoring and collecting the applicable GHG emission factors and hours spent at berth • Procedures to monitor completeness of voyages/activity distribution • procedures for updating data and cover data gaps	Amendment of Regulation 26 to add the new data required for calculating the GFI. Amendment of Regulation 5.4.5 to include SEEMP Part IV. Amendment of 2022 Guidelines for the development of a ship energy efficiency management plan to include guidance on developing updated SEEMP Part II and new SEEMP Part IV.

GFS Elements	Provisions	Amendment Placeholder
	New SEEMP Part IV to include: • Projected GFI • Projected GFS compliance balance • The methodology for calculating the GFI • Required data to be obtained to support the calculation above (as far as not included already in SEEMP Part II) Confirmation of compliance of SEEMP Part IV will be ensured before beginning of collection of data, as currently for SEEMP Part II. Depending on the scope of the GFS, the current scope of the DCS framework may have to be changed (e.g. extended to ships lower than 5.000 GT).	
Data Collection – GFS report	**Additional GFS Data** to be recorded/collected and submitted for verification include: • WtW GHG emission factors • Power capacity of energy conversion systems • Substitute sources of energy, including OPS usage **GFS report** will include: • Attained GFI • Amount, type and proof of GHG intensity on a WtW basis of each energy source used on board on a per voyage basis • Calculation of attained absolute GHG intensity surplus (if ship opts for participation in Surplus Reward System) or calculation of the number of SRUs needed for compliance	Amendment of Regulation 18, to include information on WtT GHG intensity of the fuel bunkered, based on the methodology in the forthcoming LCA Guidelines. Amendment of Regulation 27 to amend reference to “aggregate value” of GFS data that will be reported and period for retaining data to five years. New Regulation 29 titled “Annual average GHG intensity” and

GFS Elements	Provisions	Amendment Placeholder
	New Guidelines on the "Method of Calculation of the Attained Annual Greenhouse Gas Intensity" will need to be introduced, which will provide guidance on: • Methodology for calculating the GFI • Default emission factors of each energy source based on the forthcoming LCA Guidelines	accompanying Appendices to include the Additional GFS Data to be reported. New Guidelines on "Method of Calculation of the Attained Annual Greenhouse Gas Intensity"
GFS Data Collection Verification Procedure	**GFS Data Collection Verification Procedure** will include: • Verification of amount, type and emission factors of each energy source used on the basis of a GFS report submitted to the Administration and all underlying documentation • Verification of attained GFI • Verification of attained absolute GHG intensity surplus (if ship opts to participate in the Surplus Reward System) or of the number of SRUs needed for compliance	Amendment of 2022 Guidelines For Administration Verification of Ship Fuel Oil Consumption Data and Operational Carbon Intensity to extent scope to verification of GHG intensity
GFS Statement of Compliance	The deadline for the Administration to issue that annual GFS Statement of Compliance (GFS SoC) is proposed to be the 30 June, in order to allow for the intermediate procedures of verification of GFI and GFS compliance balance and submission of SRUs to take place. GFS SoC is valid for one reporting period (one year) and needs to be renewed annually.	Amendment of Regulation 6, 8.3 and Appendix X to include the new GFS SoC. Amendment of Regulation 9.12 as to the validity of GFS SoC.
Surplus Reward System – GFS Registry	**New Regulation 30** will provide rules for use of the GFS Registry. In order for the GFS Registry to record the GFS compliance of the ship, the verified GFS report should be transmitted to the GFS Registry, for the completeness of record of each ship's actual GFS performance, legal certainty and continuity	New Regulation 30 titled "Global Fuel Standard Surplus Reward System" for description of the Surplus Reward

GFS Elements	Provisions	Amendment Placeholder
	of its SRU balance. If GRUs used for compliance have been created directly from the GFS Registry, proof of payment thereof by the ship also needs to be submitted in the GFS Registry before they can be annulled.	System's operation. New Guidelines on "Development and Management of the Global Fuel Standard Registry"
Enforcement mechanisms	Port State Control (PSC) inspection of SEEMP Part III's implementation should extend to the new SEEMP Part IV. GFS compliance should allow for electronic compliance check by PSC. Company audits should be possible for GFS compliance, to ensure that company is operating in accordance with its SEEMP Part IV.	Amendment of Regulation 10.5 and .6 on PSC control to include GFS SoC under PSC scope. Amendment of 2022 Guidelines for the verification and company audits by the Administration of Part III of the Ship Energy Efficiency Management Plan to include new SEEMP Part IV under scope.

ANNEX II

PROPOSED GFS CYCLE TIMELINE

By 31 December Y0	• Verification of the updated SEEMP by the Administration • Confirmation of Compliance of the updated SEEMP issued
From 1 January Y1	• Monitoring/Recording for Y1 consumption of fuel and other energy begins
By 31 January Y2	• Submission of Y1 GFS report and underlying documentation, together with calculated absolute GHG intensity surplus if ship opts to participate in the Surplus Reward System, to the Administration for verification
By 30 April Y2	• Verification by Administration of GFS report and of attained absolute GHG intensity surplus if ship opts to participate in the Surplus Reward System or of the number of SRUs needed for compliance • Reporting of GFS report to the GFS Registry
By 31 May Y2	• Deadline for submitting SRUs or GRUs to the GFS Registry for ships that have under-complied in year Y1
By 30 June Y2	• Issuance of GFS SoC by the Administration. Valid until 30 June Y3
1 July Y2 – 30 June Y3	• PSC verify that ship has been issued a valid GFS SoC.

ANNEX III

Data Collection Plan Stage

- Y0: Ship develops an updated SEEMP and submits it to the Administration for verification.
- updated SEEMP is verified by the Administration by **31/12/Y0**.

GFS Mapping

Data Collection Stage

- Ship reports actual consumption to the Administration by submitting a GFS report and underlying documentation on actual consumption for verification by Administration by **31/01/Y2**.
- Administration verifies GHG intensity and compliance balance and submits verified GFS report to GFS Registry by **30/04/Y2**.

(Over-)Compliant ship (average annual GHG intensity of the energy used on board in Y1 equal or below

Surplus (total absolute GHG intensity of Y1 below the applicable GHG limit in Y1):

SRUs are credited to the ship's individual account in the GFS Registry.

The Registry tracks the ownership of the SRUs.

Under-compliant ship (average annual GHG intensity of the energy used on board in Y1 above the

- Ship uses SRUs already acquired in the past
- Ship acquires SRUs from other ships
- Ship buys GRUs directly from the GFS Registry (in the first years of implementation).

Ship directs the Registry:

- to annul corresponding SRUs available in their account
- create and annul additional GRUs in their account, by submitting at the same time proof of payment thereof

Ship is provided with GFS SoC by **30/06/Y2.**