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FURTHER CONSIDERATION AND FINALIZATION OF THE ASSESSMENT AND SELECTION OF MEASURE(S) TO FURTHER DEVELOP IN THE CONTEXT OF PHASE II OF THE WORK PLAN FOR THE DEVELOPMENT OF MID- AND LONG-TERM MEASURES

Alternative fuel producer perspectives: capabilities, future potential and support for a Well-to-Wake approach

Submitted by IBIA

SUMMARY

Executive summary:	This document aims to highlight the strong benefits of a Well--to--Wake (WtW) approach for the assessment of marine fuel GHG emissions, and how the adoption of a sole Tank-to-Wake (TtW) approach has the potential to negatively impact the future marine fuel landscape as well as jeopardize IMO's overall ambition to phase out GHG emissions associated with international shipping. It also outlines the potential for low-GHG fuel production, along with existing and under-development certification mechanisms that align with a WtW approach.
Strategic direction, if applicable:	3
Output:	3.2
Action to be taken:	Paragraph 25
Related documents:	MEPC 79/7/12 and MEPC 80/7/4

Background

1 As the Organization revises the GHG emissions Strategy while concurrently developing supporting measures and guidelines on life cycle GHG intensity of marine fuels (LCA guidelines), the WtW approach has come to the attention of many stakeholders. These stakeholders include producers of alternative fuels, shipbuilders, shipowners and charterers, buyers, sellers and traders of maritime cargo, industry associations, NGOs, non-for profit organizations and others – all working to assist with the transition of the maritime industry to reduced GHG emissions.

2 IBIA's stance on decarbonization is that the right regulatory signals are needed to incentivize the energy transition and encourage fuels and technologies that are technically feasible, safe to use, environmentally sound and truly sustainable, and that true sustainability means taking full WtW life cycle emissions into account. Regulations should stimulate innovation and demand for alternative fuels through a combination of economic and technical measures, including a price on carbon and CO_2 equivalents and a gradual phasing through a fuel GHG intensity limit.

3 In order to support a WtW approach, the marine fuel supply industry will need a workable life cycle assessment methodology and associated certification schemes to reward and promote the provision and use of truly sustainable fuels. In this regard, IBIA notes with appreciation the work undertaken by the Correspondence Group on the Marine Fuel Life Cycle GHG Analysis to develop draft LCA Guidelines. An interim report on this work was provided in document MEPC 79/7/12 (China et al.) and the draft LCA Guidelines set out in the final report of the Correspondence Group (document MEPC 80/7/4 (China et al.)) will be up for consideration, finalization and adoption at MEPC 80 as a starting point for calculating GHG emissions from marine fuels from a full WtW perspective.

4 While traditional oil-based fuels are still the dominant energy source for international shipping, IBIA has several members already involved in the supply of alternative fuels, and members making plans for providing alternative fuels in the future. IBIA sees strong consensus developing among many stakeholders that taking only Tank-to-Wake (TtW) emissions into account, while ignoring the GHG impact of extraction, production and distribution of marine fuels, will potentially lock the shipping industry into a decarbonization pathway that is no more impactful than the current one. In some production pathways for low-carbon alternative fuels, the bulk of GHG emissions are upstream and can actually represent a greater overall WtW GHG potential than existing fossil fuels do on a TtW basis.

5 The draft LCA Guidelines describes over 100 fuel production pathways and defines a Fuel Lifecycle Label (FLL), which carries information about fuel type, feedstock, conversion/production process, GHG emission factors, information on fuel blends and sustainability themes/aspects. The guidelines also specify the elements of FLL subject to verification/certification and include a general procedure on how the certification scheme/standards could be identified. The exploration of WtW default emission factors signify a deep commitment to a thorough, ongoing assessment of the subject.

6 In order to give certainty to the market, those considering production and distribution of low and net zero carbon marine fuels need to know whether full WtW GHG emissions will be taken into account in IMO regulations to make investment decisions.

7 IBIA has worked with members and other parties with an interest in the production and distribution of alternative fuels to present their perspectives on current and future prospects for marine fuel supply, and their views on the mechanisms to meet requirements for the FLL, including the option to provide actual emissions data to certify that fuels can be better than the default emission factors provided in the LCA Guidelines.

Production potential for low-carbon marine fuel alternatives

8 Encompassing both operational and proposed plants, the Ammonia Energy Association (AEA) has identified the development of over 170 million tonnes (approximately 3.23 EJ) annual production capacity for low-carbon ammonia worldwide. This comprises 27.1 million tonnes (0.51 EJ) of fossil-based ammonia, and 144.7 million tonnes (2.75 EJ) of renewable energy derived ammonia. By 2030, production capacity of

announced projects already represents 20.6 million tonnes (0.39 EJ) of fossil-based ammonia and 47.2 million tonnes (0.90 EJ) of renewable energy derived ammonia. When assessing this project pipeline for low-carbon ammonia plants, it is concluded that supply will not represent a bottleneck.

9 The Methanol Institute has identified a low-carbon methanol production industry of approximately 8 million tonnes (0.15 EJ) per year developing by 2027. As there are numerous production pathways for both renewable methanol and bio-methanol, there are varying degrees of emissions reduction compared to conventional marine fuels, depending upon the feedstock, sources of renewable power and the technology platform. Current development momentum stems from major shipping companies investing in dual fuel methanol ship technology, and even in green fuel production projects directly to secure supply ahead of new build ships entering service by 2027. IRENA has forecast that by 2050, methanol will increase from its current level of global production (approximately 100 million tonnes per year or 1.99 EJ) to over 500 million tonnes per year (9.95 EJ), with the increase split between renewable methanol and bio-methanol.

10 The European Biodiesel Board (EBB) has identifed a developing annual production industry of 42 million tonnes per year of sustainable biodiesel (1.78 EJ) in Europe alone. This represents a more than doubling of current production capacity. It should be noted that, as demand for renewable and low-carbon fuels surges worldwide, feedstock scarcity and competition from other industries will likely affect the availability of affordable, sustainable biodiesel for the marine sector. Measures taken by IMO will need to reflect this potential roadblock.

11 Bio-LNG produced from biomethane using waste streams as feedstock can provide a renewable and potentially GHG-neutral WtW replacement of fossil LNG. According to the European Biogas Association (EBA), confirmed Bio-LNG producing plants in Europe were set to reach 34 adding up to 3.5 TWh (0.0126 EJ) by the end of 2022, and expected to reach 100 adding up to 12.4 TWh (0.045 EJ) per year by 2025. Plants and total production capacity may rise further if more projects are confirmed. The EBA says Europe's total biomethane production in 2021 amounted to 3.5 bcm (37 TWh or 1.33 EJ) and estimates that it can reach up to 167 bcm of biomethane, nearly 48 times the 2021 volume by 2050. Biomethane plants may connect to a gas grid, but also have the option of producing Bio-LNG suitable as a transport fuel.

Development of LCA certification using primary data

12 A TtW approach only accounts for downstream emissions from in fuel use. Upstream emissions (e.g.: production, conversion, distribution) account for a significant percentage of emissions over the full fuel life cycle, and must be taken into account. To this end, certification schemes for future fuels that align with a WtW approach exist already and others are under development.

13 AEA is developing a global certification scheme for ammonia. According to AEA, the certificates will provide clear, credible and verifiable demonstration of carbon intensity and other sustainability metrics, in a tradable format. The aim is not to create a new standard, but to ensure that high-quality data is available to enable consumers of ammonia to demonstrate that the product meets the standards set by regulators across multiple regions and sectors.

14 A global ammonia certification scheme with a Well-to-Gate (point of delivery from production plant) boundary could fit well with WtW reporting for marine fuels, ensuring their credibility and thus spurring investment. With a pilot scheme roll-out early 2024 and implementation in 2025, the AEA believes its certification scheme will satisfy IMO requirements

for timely implementation of a WtW treatment in support of measures adopted. Furthermore, this scheme builds upon international frameworks and standards, using as a foundation the methodology developed under the International Partnership for Hydrogen and Fuel Cells in the Economy (IPHE)* for calculating the GHG emissions from the production, conversion, and transportation of hydrogen and its derivatives (including ammonia and methanol).

15 The Methanol Institute notes that the carbon footprint of methanol depends on three elements: production feedstock, production pathway and end-of-life emissions when the fuel is combusted. Accounting for all three would only occur in a WtW approach. Within a single, generalized fuel production pathway (e.g.: "fossil" methanol, "renewable" methanol), variations in the emissions intensity of feedstock, technological differences between sites and supply chain differences can all cause significant variations in the LCA carbon footprint results. The carbon footprint of methanol should be measured and certified to account for these individual differences and the full LCA – as is advised for any renewable fuel.

16 End-of-life emissions when methanol is combusted cannot be avoided. But, different feedstocks and production pathways can reduce the overall carbon footprint of the fuel, even to a point where methanol is net-neutral or net-negative on a WtW basis. Solid biomass, municipal solid waste and (particularly) biomethane are all feedstocks that can achieve these reductions. Production pathways including renewable electricity and captured carbon dioxide can also reduce WtW emissions. But – as noted above – each production scenario is different, and certification is crucial.

17 In Europe, all biofuels must meet sustainability requirements outlined in the Renewable Energy Directive (RED). Emissions calculations based on the RED include upstream and downstream emissions, from the growing of feedstocks to their transport, processing, and combustion. This aligns strongly with a WtW approach.

18 RED technical annexes include default values for biofuels set 40% higher than typical values, but the approach has proven very successful. It is low enough that use of biofuel remains viable, but high enough to encourage producers to improve their production processes (and get it certified by voluntary schemes). Most European biofuels producers have opted to participate and get their fuel certified. The EU's approach on biofuels illustrates the extent to which support for such schemes is underpinned by default values. Such values create a stable baseline for fuel producers and users to work from, while sending a strong signal to fuel producers to work to prove, through relevant certification and verification schemes, that they are providing fuels that are better than the default values.

Cross industry relevance for WtW certification and trading

19 The fuel options available to global shipping can also serve as general energy commodities and/or low-carbon building blocks for a wide range of industry sectors which are intent on their own GHG emission reductions. Producers and traders of these commodities need to demonstrate lifecycle GHG intensity on a WtW or WtG basis, giving their customers the necessary assurance that any regulatory requirements are being met. IMO can tap into this and explore alignment, ensuring international policies on marine fuel carbon assessment boundaries seamlessly connect with other sectors.

* https://www.iphe.net/iphe-wp-methodology-doc-nov-2022

Shipping as a critical enabler for global energy transition – only possible with WtW

20 Producers of low-carbon fuels need to be able to sell their fuel with a valid and verified lifecycle carbon content in a global market. International shipping is seen as an important first-mover, potentially creating sufficient demand to unlock low-carbon production. Likewise, it is also critical for such low-carbon fuels to be in a position to leverage off existing infrastructure and investments to enable these new fuels to come to market. There is a need to incentivize and not penalize producers or consumers, in order for lower-carbon footprint fuels to enter the market in a transitional approach.

21 In a scenario where IMO continues with a TtW policy rather than implementing a WtW foundation for its GHG reduction strategy, an unfortunate (and avoidable) delay in the availability of low carbon fuels is likely. Without the clear market signal a WtW approach would bring, investments in potential low carbon fuel production plants will be put on hold. This would in turn prevent the scale-up needed to reduce the cost of low-carbon fuels in general.

22 These combined factors of scarcity and high cost represent further barriers to the maritime sector's decarbonization schedule. Even if industry stakeholders independently try to progress real and sustainable GHG emission reduction by full lifecycle reference, they will face high barriers, potentially hindering the maritime industry from achieving decarbonization targets aligned with the Paris Agreement on climate change.

Summary of fuel producers' position

23 Producers of alternative low-carbon marine fuel are confident they can deliver credibly certified, low-carbon fuels to the maritime industry. These will have Fuel Lifecycle Labels detailing the criteria and metrics as required by IMO, helping the Organization to record and calculate the WtW GHG emissions resulting from the consumption of such fuels. It is essential that the Organization treats alternative fuels on a WtW basis to provide a signal to the market to prepare for the production and certification of truly sustainable fuels. Sole TtW accounting will fail to signal sufficient potential market demand, preventing investment in true low-carbon fuels to support IMO’s overall ambition to phase out GHG emissions associated with international shipping.

24 IBIA therefore urges the Organization to move forward on the following basis:

.1 low-carbon alternative marine fuels must be assessed on a WtW basis, with TtW representing only the last part in a greater life cycle;

.2 recognize that a solely TtW perspective has the potential to inhibit the achievement of IMO GHG emission reduction ambitions;

.3 recognize that a WtW approach sends clear market signals to fuel producers and consumers, facilitating the necessary scale-up and use of alternative maritime fuels;

.4 alternative fuel producers can and will deliver marine fuels that are properly certified on a batch or other basis as preferred by the Organization, providing demand is stimulated through appropriate technical and economic measures;

.5 default emission factors should be included on a geographical and feedstock basis at minimum, and should be sufficiently conservative to encourage participation in voluntary certification schemes to provide products with better-than-default emission factors; and

.6 when and where voluntary certification schemes exist, or are developed in the future, the values certified by these schemes should be eligible for use.

Action requested of the Working Group

25 The Group is invited to consider the information contained in this document and the recommendations set out in paragraph 24, and to take action as appropriate.