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ENERGY EFFICIENCY OF SHIPS

GHG emissions reductions through mitigating the operational and commercial practice of Sail Fast Then Wait

Submitted by BIMCO

SUMMARY	
Executive summary:	Effective voluntary actions are needed to enhance the operational energy efficiency of ships to facilitate compliance with regulations to reduce GHG emissions. Ships waiting for a berth on arrival at a destination port is recognized as one of the major operational inefficiencies. The "Blue Visby Solution" (BVS) demonstrates that such inefficiencies can be addressed through a combination of technical and contractual components and recently conducted prototype trials confirm it would support efforts by ships to improve their carbon intensity indicator rating, as required by regulation 28 of MARPOL Annex VI.
Strategic direction, if applicable:	3
Output:	3.2
Action to be taken:	Paragraph 33
Related documents:	Resolution MEPC.377(80); MEPC.366(79), MEPC.323(74); MEPC 77/7/15, MEPC 81/INF.29, MEPC 81/INF.30 and MEPC 63/INF.7

Introduction

1 The entry into force of Chapter 4 of MARPOL Annex VI on 1 January 2013 established a requirement for ships engaged in international shipping to enhance their energy efficiency. The adoption of the *2023 IMO Strategy on the Reduction of GHG emissions from ships* (resolution MEPC.377(80)) and with it the levels of ambition of a pathway to achieving net-zero "by or around" 2050, has reinforced the need for ship operational energy efficiency to be maximized.

2 The Organization already recognizes that the ship-port interface plays a key role in optimising the energy efficiency of ships and adopted resolution MEPC.366(79)[1] inviting member States to encourage voluntary cooperation between the port and shipping sectors to contribute to reducing GHG emissions from ships.

3 Resolution MEPC.366(79) invites member States to promote the consideration and adoption by ports within their jurisdiction, of regulatory, technical, operational and economic actions to facilitate the reduction of GHG emissions from ships that could include support for the optimisation of port calls and facilitating voluntary cooperation through the whole value chain, including ports, to create favourable conditions to reduce GHG emissions from ships through shipping routes and maritime hubs consistent with international law, including the multilateral trade regime.

4 Resolution MEPC.366(79) also invites member States to facilitate the uptake of actions which may include supporting the industry's collective efforts to improve quality and availability of data and develop necessary global digital data standards that would allow reliable and efficient data exchange between ship and shore as well as enhanced slot allocation policies thereby optimising voyages and port calls and facilitating just-in-time (JIT) arrival of ships.

5 This document introduces one commercial and operational solution to ship-port inefficiency that can improve the operational energy efficiency of shipping - the “Blue Visby Solution” (BVS).

The “Sail Fast, Then Wait” operational and commercial practice

6 Ocean cargo transport is a highly fragmented industry in terms of ship types, cargoes and trades, as well as types of the entities involved: containerships, dry bulk carriers, wet bulk carriers, general and project cargo carriers and roll-on/roll-off ships.

7 Approaching ocean-cargo transport from the perspective of its role in supply chains, a similarly fragmented picture emerges: the supply chains for containers are very different to those for crude oil and its products, grains and other agricultural commodities, coal, iron ore, general cargo, vehicles or industrial equipment.

8 The common thread running through the industry and supply chains is that the ocean journeys of cargo ships are not systemically optimized. While there has been great progress in the last 30 years in satellite coverage, communications, weather forecasting, and data processing, all of which have enabled the development of sophisticated and effective weather routing and voyage planning systems, this has resulted in the optimisation of the voyages of individual ships only. Optimization of the voyages of cargo ships as a system remains elusive.

9 This absence of systemic optimisation means that cargo ships follow the same operational model used since the age of sail: “Sail Fast Then Wait” (SFTW). With SFTW each ship departs towards its destination at its own optimal speed (often, the service speed, which is very similar to that of every other ship in the same ship type), and without regard for other ships or for the conditions at the destination.

10 This practice has been tolerated or, indeed, encouraged for various reasons: the cost of excessive fuel consumption is a fraction of the value of the cargo on board; the uncertainties at sea and their impact on arrival at port have traditionally discouraged long-term voyage planning; emissions have not been a concern until recently; in certain contract types SFTW

[1] Adopted on 16 December 2022 and revoking resolution MEPC.323(74)

presents financials advantages; and, perhaps above all, the contractual architecture of maritime trade gives rise to "split incentives", or a type of "agency problem", amongst the various industry participants.

Decarbonisation and SFTW

11 Operational optimisation is no longer merely desirable but has become an imperative in ocean maritime trade and supply chains: not only does the trajectory towards decarbonisation require existing ships to become more efficient, but also all new fuels under consideration (methanol, ammonia, hydrogen) have a much lower energy density than present marine fuels in combination with an expected increase in cost. Therefore, future ships powered by such new fuels will benefit from operating at maximum energy efficiency. It is in this context that new initiatives to help reduce GHG emissions are needed.

12 In 2011, document MEPC 63/INF.7 (OCIMF) recognized that contractual frameworks between owners and charterers can be amended to motivate both stakeholders to save fuel as it is inherently inefficient for a ship to steam at high speed to a port where known delays to cargo handling have been identified

Impact of SFTW on CII

13 MEPC 76 adopted amendments to MARPOL Annex VI that included requirements for operational energy efficiency of a ship in the form of the Carbon Intensity Indicator (CII) and the CII based annual rating. This short-term measure came into effect on 1 January 2023. The two key variable parameters for determining CII are the CO_2 emissions resulting from fuel oil used by the ship and the distance travelled by the ship.

14 The CII rating can be enhanced therefore not only by reducing the CO_2 emitted per mile travelled while underway, but also by reducing the ship's total CO_2 emissions for the voyage. This is achieved by reducing waiting time for a berth.

The contractual foundations of SFTW

15 The operational practice of SFTW is underpinned by the contractual architecture of international maritime trade in various ways as follows:

.1 bulk cargo ships perform voyages at the instruction of their charterers, who have the right to give orders as to the commercial employment of the ships. The relevant contracts (voyage and time charterparties) contain speed warranties and the obligation for the ship to sail with utmost dispatch, or similar;

.2 charterparties usually contain requirements for the ship's arrival at a loading port or place by a particular date, failing which, the charterer has the option to cancel the charterparty;

.3 in voyage charterparties where the cost of fuel used is for the shipowner's account, the ship's prompt arrival at the port of destination triggers financial consequences in the form of "demurrage", which is legally defined as "liquidated damages for delay" but, from a financial perspective, is an income stream for the shipowners; and

.4 In time charterparties, the fuel cost falls on the charterer, meaning that shipowners have no incentive to optimise operations and, indeed, are contractually obliged to follow the charterers' operational instructions.

The above features give rise to what is sometimes referred to as an "agency problem" or "split incentives" in charterparties.

16 However, the charterparty perspective is too narrow, and the obstacle to eradicating SFTW is in fact greater. Ocean cargo transport is a link in the supply chain. Viewed from the perspective of supply chains, a further obstacle appears: the contracts for sale and purchase of commodities on board the ships also contain provisions that require prompt arrival of the ship. For example, sale and purchase contracts often contain provisions for laycans and demurrage (similar to provisions in charterparties), as well as for delivery periods of the goods on board.

17 Finally, contracts of carriage evidenced by bills of lading incorporate terms from charterparties, creating a further layer of complexity: a ship carrying cargo that operates in any way other than with due dispatch is committing the cardinal sin in maritime law of an unlawful deviation.

18 It is clear from the above that the present contractual architecture of international maritime trade stands in the way of eradicating SFTW.

The Blue Visby Solution

19 The BVS is a multilateral optimization platform consisting of various components: technological, operational, as well as contractual. It differs from virtual arrival and JIT because it approaches SFTW from the perspective of systems optimisation, rather than unilaterally (individual ship voyage planning), or bilaterally (as in virtual arrival), or from the perspective of port/berth management (as in JIT). In addition, the BVS includes a contractual mechanism for the sharing of costs and benefits amongst the platform participants, so as to remove the obstacle of split incentives.

20 Over a period of several years, and with support from over 33 members of the Blue Visby Consortium (https://bluevisby.com/the-consortium/), which is co-ordinated by Helsinki-based software company NAPA Oy and London-based law firm Stephenson Harwood LLP, the project has progressed iteratively through several stages: from academic studies to proofs of concept, to hindcast simulations in real operating conditions, to virtual pilots with the use of digital twins and, finally, to prototype trials with CBH Group in March/April 2024.

21 The Blue Visby Consortium comprises entities with expertise in ship owning, commodities trading, port management and operations, maritime economics, carbon consulting, as well as academics, and other non-commercial entities, such as BIMCO, UK Hydrographic Office, the Baltic Exchange, Carbon Trust and the Ocean Conservancy.

22 The aim of the BVS is to mitigate the effects of SFTW in the near term, and thus deliver very substantial GHG savings from the existing fleet. In the medium term, it aims to deliver considerable energy efficiencies, which will be necessary for the era of new fuels, all of which will be scarce, more expensive and have a lower energy density than marine fuel oil.

23 SFTW cannot be addressed by individual ships, or bilaterally as between an individual shipowner and an individual charterer. It is a systemic challenge that requires a systemic solution. The BVS combines software, operations and contracts, so as to systemically optimize the ocean passage of participating ships, and thereby reduce CO_2 emissions. It does not

interfere with the voyage planning or weather routing of individual ships; and it does not interfere with berthing or with port operations or inventory management of terminals. A crucial component of the multilateral nature of the BVS is a benefit-sharing mechanism, "Blue GA" (inspired by the age-old maritime principle of general average), which incentivises participation and removes the obstacle of split incentives.

24 The BVS is compatible with every other decarbonisation initiative and is not dependent on the choice of fuel-type. The BVS is designed to operate as a neutral, transparent, independent and collaborative platform that leverages the maritime industry's best traditions: concerted action to deal with common perils except that this time it's not a maritime emergency but the climate emergency; and the BVS is delivered through freedom of contract under English law.

The compatibility of the BVS with other efficiency and optimisation mechanisms

25 The BVS is compatible with any weather routing or voyage optimisation system that a shipowner or operator may wish to follow. Indeed, such services are enhanced by BVS's provision of a Requested Time of Arrival (RTA), which serves as a useful arrival target for weather routing and voyage optimisation.

26 The BVS is compatible with inventory management systems, as it does not interfere with cargo operations or berthing time.

27 The BVS is compatible with JIT systems, as it operates at a time and place prior to the engagement of any such JIT system. Indeed, one of the Blue Visby Consortium members is the Port Authority of New South Wales (Australia), which operates one of the most efficient JIT systems in the world (the "Vessel Arrival System"), the creation of which was prompted by the grounding of the **M/V Pasha Bulker** at Newcastle.

28 Importantly, the BVS can operate in relation to destinations that operate a JIT system, or a vessel arrival system based on a stem (lineup) or those that operate on a First Come First Served basis.

Benefits of implementing the BVS

29 In addition to GHG emissions reductions, the BVS has the potential to deliver the following benefits:

.1 improvement of anchorage safety, through the reduction of ships at anchorage or drifting in the vicinity;

.2 reduction in underwater radiated noise (according to Consortium member the Ocean Conservancy);

.3 reduction in whale strike risk (according to Consortium member the Ocean Conservancy); and

.4 air emissions reductions and consequential reduction in mortality (according to Consortium member Hong Kong University of Science and Technology)

30 The prototype trials showed that positive impacts may well extend to ports and terminals, anchorage congestion and the dry bulk and tanker fleet worldwide.

Next steps

31 The particular trade and commercial framework to which the prototype trials were applied have similarities with many other segments of dry and wet bulk trades in many parts of the world. Therefore, the experience and learnings of the prototype trials will be scaled up and expanded. Similar considerations apply to the other planned prototype trials, which are designed to address the different characteristics of other trades and commercial frameworks. Prototype trials will continue and involve more parties and market segments. These first results are a very significant milestone towards the scaling up and commercial deployment of the BVS.

32 While the focus of the BVS has been on the dry bulk and tanker sector as this is where the greatest efficiency gains may be made, preliminary studies suggest that there may also be benefits in deploying the BVS to the container segment. Relevant activities will accelerate in the medium term.

Action requested of the Committee

33 The Committee is invited to note the information provided in this document .