The Institute of Chartered Shipbrokers

NEWSLETTER

Singapore Branch Edition

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Navigating the Winds of Change

by Capt. Saunak Rai, FICS

We are in a never before time in shipping, as shipping is on the cusp of a massive change and this change will impact all of us in different ways. The 83rd session of the IMO's Marine Environment Protection Committee (MEPC 83), held in April 2025, marked a significant milestone in global maritime decarbonization. This meeting finalized the draft legal text for the IMO Net-Zero Framework, this included the technical and economic measures designed to drive the industry toward net-zero greenhouse gas (GHG) emissions.

Among its most impactful developments was the introduction of a global GHG pricing mechanism. From 2027, ships that exceed GHG emission limits will pay

- a fee of USD 100 per tonne of CO_2 equivalent under Tier 1, and
- USD 380 under Tier 2.

This system rewards compliant ships with "surplus units," which can be banked, traded, or used for future compliance. The anticipated USD 13 billion in annual revenue from the GHG emission penalties will support zero- and near-zero emission technologies and help developing nations achieve equitable transitions.

IN THIS ISSUE

PRUDENT WAYS TO REDUCE DEBALLASTING TIME FOR EFFICIENT SHIP OPERATIONS
page 3

INTEGRATING ESG PRINCIPLES FOR SUSTAINABLE TRANSITION
page 5

CARRIER LIABILITY – CONTAINERS
page 10

EDITORIAL
page 11

SHIFTING ALTERNATE FUEL TANKS FROM ABOVE DECK TO UNDER DECK ON BULK CARRIERS
page 16

Complementing this is a new regulatory concept of GHG Fuel Intensity (GFI), which mandates that each ship report and maintain an attained GFI below its annual target, based on a full well-to-wake (WtW) emissions basis. By 2035, fuels qualifying as zero or near-zero must emit no more than 14 gCO_2eq/MJ.

The session also reviewed short-term GHG measures such as the Carbon Intensity Indicator (CII) and Energy Efficiency Existing Ship Index (EEXI). Updated CII reduction targets now require a 21.5% improvement in fleet efficiency by 2030, relative to 2019 levels. MEPC 83 also introduced rigorous protocols for Methane and Nitrous oxide measurement, reflecting increased scrutiny of non-CO_2 emissions.

Ship-brokers will play a pivotal role in guiding stakeholders through these evolving regulatory landscapes. Our ability to interpret complex compliance frameworks, provide emissions-related market intelligence, and structure green chartering agreements makes the ship brokers an indispensable strategic partner in driving this change in the industry, by .

- Advising clients on CII and GFI compliance strategies.
- Facilitating access to compliant tonnage and greener fuels and providing them guidance on the most appropriate solution.
- Navigate the surplus unit and GHG levy mechanisms; to ensure Ship owners as well as charterers use them effectively.
- Structure contracts with emissions-linked clauses; envisioning the future issues and disputed and ensuring that they are avoided from the contract stage.

In a de-carbonizing maritime economy, ship-brokers are more than intermediaries—they are advisors, strategists, and enablers of change. Their expertise will be essential as the industry shifts from intention to implementation.

Singapore, as a leading maritime hub, is well-positioned to champion these transitions and serve as a model for global adoption.

About the Author

Capt. Saunak Rai is the General Manager of “FueLNG”, and the Chairman of the National Technical Committee for Bunkering (Cryogenic and Gaseous Fuels). He is also the Vice Chairman of ICS SG Branch and a thought leader in Maritime Decarbonization.

Got something to share? Let us hear it!

If you've got an article, a poem, or a story that you'd like to share, here is your chance! Send it to us before ***25 June 2025*** *to be included in the next edition. Please ensure it is not longer than 700 words. Email us at membership@ics.org.sg.*

Prudent Ways to Reduce Deballasting Time for Efficient Ship Operations

by Capt. Vinod Dubey, FICS

Deballasting is a critical shipboard operation with a high commercial impact, particularly in dry bulk operations where fast loading rates are becoming common. Delays during deballasting can lead to financial losses and damage a ship's reputation by port blacklisting that vessel for future calls. In this article, we will explore how a Chief Officer can plan and employ prudent strategies to avoid potential delays during deballasting. This information can also be utilized by commercial operators ashore to learn about Ballasting and in-time guiding their ship staff.

Understanding the Ballasting Process:

Before delving into reducing deballasting time, it's essential to grasp the basics. Ballast is the weight added to a ship to maintain stability and control its draft. Deballasting involves removing ballast water from the ship's tanks using ballast pumps. Simplistically, two methods can reduce deballasting time: keeping minimum ballast and deballasting at a fast rate. However, the reality is more complex.

Challenges of Minimum Ballast:

A ship's ballast quantity is regulated by forward and aft drafts. The aft draft must ensure the propeller is fully submerged, while the forward draft should meet specific minimum requirements to avoid slamming in heavy weather and comply with IMO visibility criteria. These mandatory requirements pose obstacles when aiming to keep minimum ballast.

Optimizing Propeller Immersion:

To reduce ballast quantity concerns, the Chief Officer should not aim for 100% propeller immersion in loadicator, as 50-60% immersion is sufficient to ensure the propeller is physically submerged. Adhering to the propeller immersion draft provided in the loading manual can be more practical and timesaving.

Flexibility in Forward Draft:

While the IMO visibility requirement mandates a certain minimum forward draft during sea passage, once the vessel arrives within a port, the Chief Officer can explore reducing the forward draft further, provided there are no restrictions from pilots. This flexibility can lead to substantial time savings during deballasting operations

Air Draft Considerations:

Bulk carriers often face air draft requirements that necessitate taking additional ballast in cargo holds to allow loaders to reach the top of hatch coamings for loading. However, checking the air draft requirement in conjunction with tide is crucial. If the requirement is given with high tide, berthing at low tide might eliminate the need for ballast in the cargo hold, saving valuable deballasting time. Additionally, selectively avoiding taking water in double bottom tanks adjacent to cargo holds being flooded can further expedite the process.

Strategic Draft Management:

Another strategy is to assess whether the vessel is loading to its draft marks or to meet draft restrictions at the discharge port. If the vessel's summer draft is 14 meters but loading is only necessary until 12 meters due to discharge port restrictions, the excess ballast need not be removed at the load port. Instead, it can be gradually removed during the passage to the discharge port, ensuring the vessel reaches the required draft criteria of 12 meters upon arrival.

Ballast pumps / eductor PMS

We have talked various various strategies to keep minimum ballast qty. However, there will be ballast on board, which needs to be removed as fast as possible. Compliance with PMS for Ballast pumps / eductors, keeping emergency spares on board and carrying out regular efficiency test will ensure that best deballasting rate is achieved.

Conclusion:

Challenges are inherent in shipboard operations, but prudent seafarers with experience can learn various ways to address them effectively. When it comes to deballasting, complying with mandatory and port-specific requirements is essential. However, by considering factors such as minimum propeller immersion draft, forward draft and trim requirements, air draft in conjunction with tide, and load/discharge port draft restrictions, effective PMS for ceballasting system, Chief Officers can minimize the chances of delay due to deballasting. By planning ahead and making informed decisions, a prudent ship’s officer can reduce delays and mitigate financial and reputational risks associated with deballasting.

About the Author

Capt. Vinod Dubey, is a Master mariner, MBA from Cardiff Metropolitan, Commercial Operations Manager, Adhart Shipping Pte Ltd. He is a sailor by profession and writer at heart. He has published his novel " Indiyaapa" (a fictional love story of a sailor) followed by his recent poetry collection " Weekend Wali Kavita".

Integrating ESG Principles For Sustainable Transition

by Sridev Mookerjea, FICS

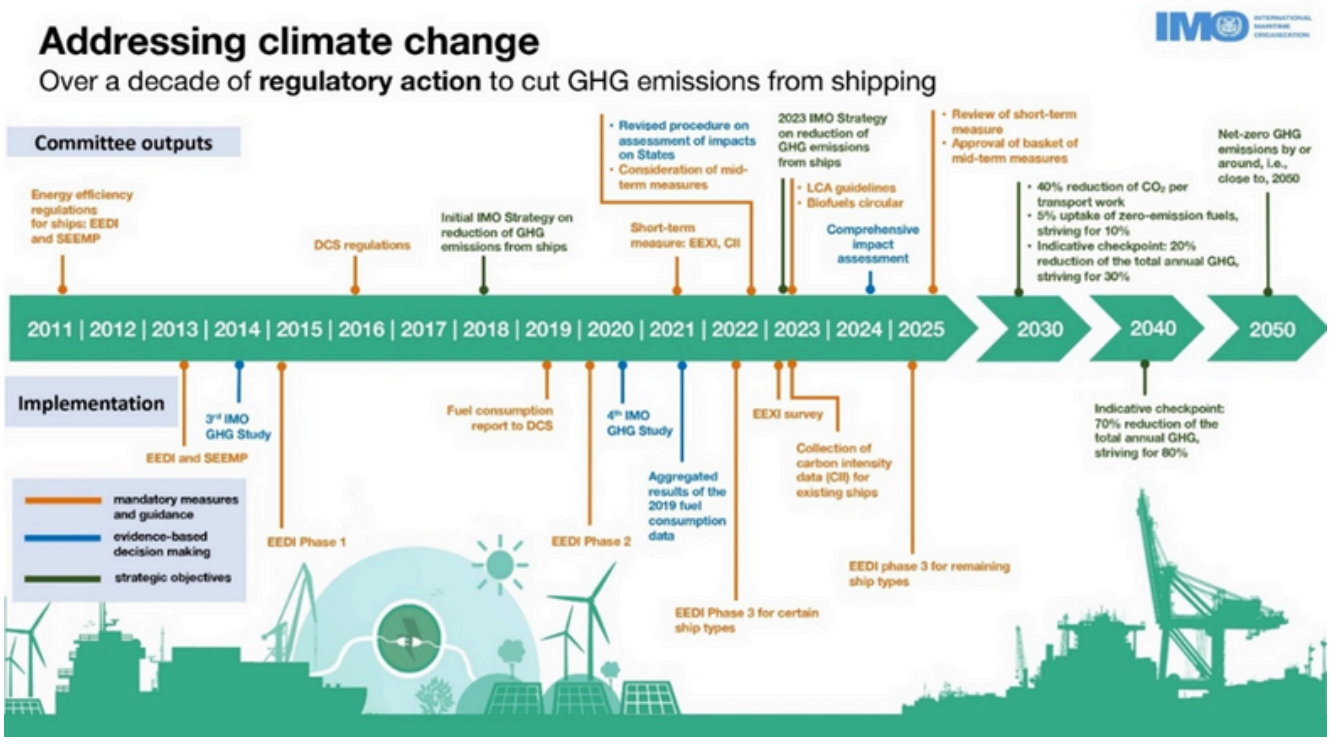
As the world shifts toward sustainability, integrating Environmental, Social, and Governance (ESG) principles into the maritime sector is crucial for facilitating its transition toward more responsible and sustainable operations. ESG frameworks provide a roadmap for addressing both the ecological and social impacts of maritime activities while promoting strong governance structures to ensure accountability and long-term change with full transparency.

"E" in ESG: Reducing the Maritime Footprint

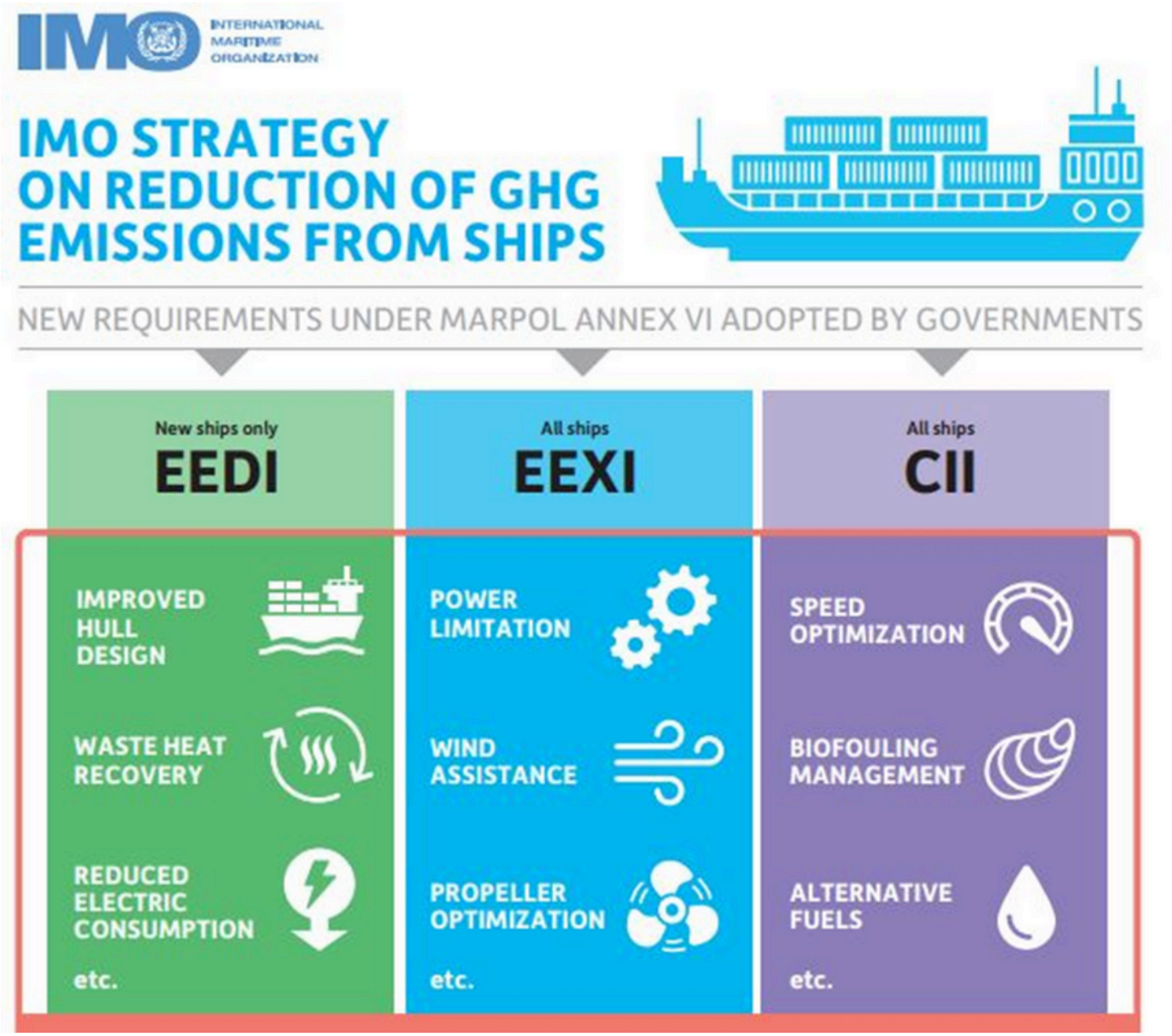
The "E" in ESG stands for Environmental sustainability. Decarbonization is primarily within the "E" of the ESG.

Shipping is responsible for around 2-3% of global CO2 emissions, so decarbonization strategies are at the heart of the industry's push to become more sustainable.

The International Maritime Organization (IMO) has set ambitious targets to achieve net-zero greenhouse gases (GHGs) emission by 2050. Regulations like the **Energy Efficiency Existing Ship Index (EEXI)**, the **Carbon Intensity Indicator (CII)** for existing ships and **Energy Efficient Design Index (EEDI)** for most newbuilding ships are pushing operators to improve their environmental performance.



IMO targets: Reach net-zero GHG emissions at 2050 (Source: IMO)



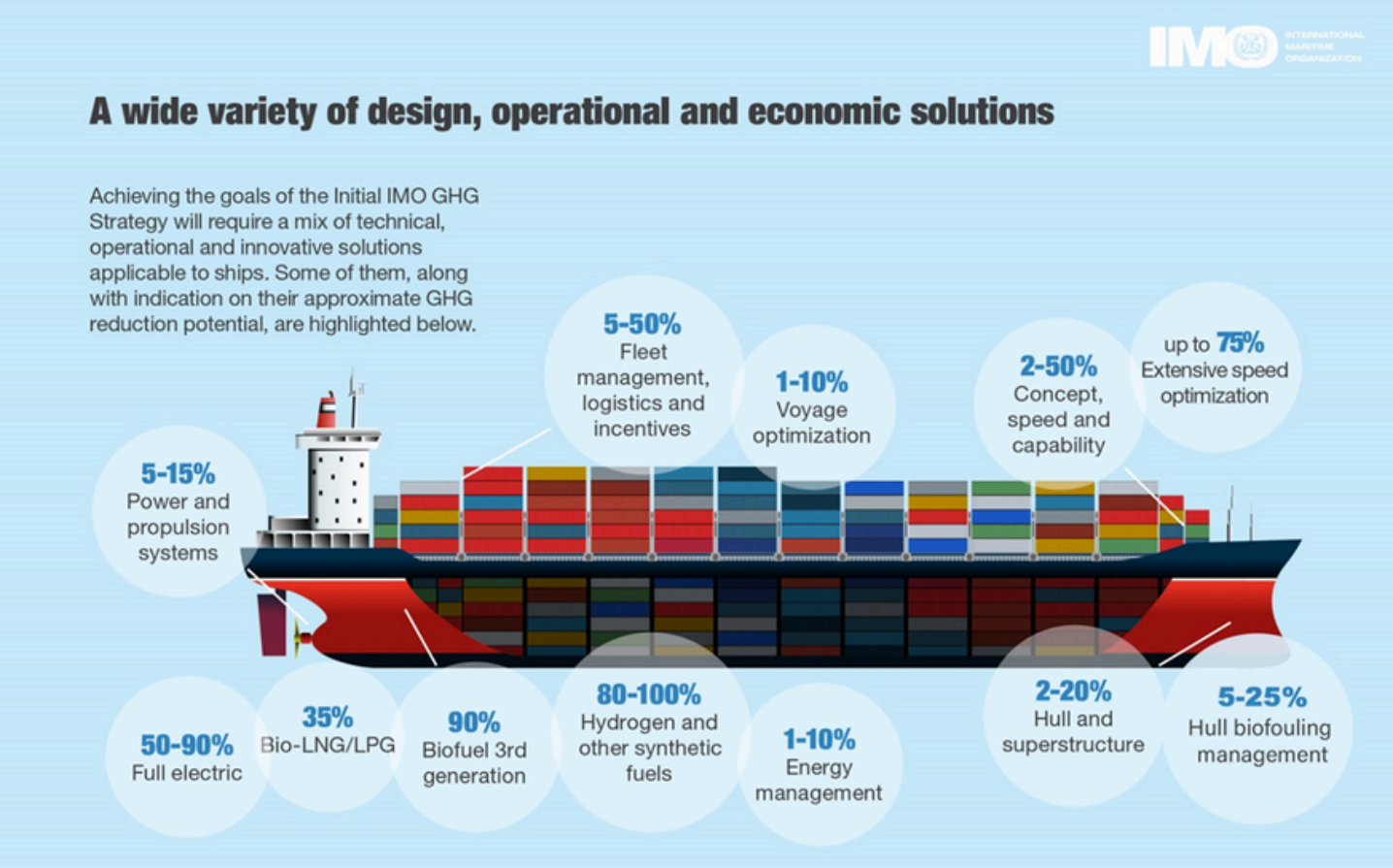
IMO strategy on reduction of GHG Emissions from Ships (Source: IMO)

Key strategies for decarbonization in the maritime industry include:

1. Alternative Fuels: Transitioning to cleaner fuels such as LNG, ammonia, biofuels, and hydrogen.

2. Energy Efficiency: Improving ship design (e.g., advanced hull shapes), adopting energy efficiency measures (e.g., hull optimization, slow steaming) and using energy-saving devices that reduce fuel consumption.

3. Zero-emission Vessels: Developing hybrid electric ships powered by batteries and renewable energy sources like wind and solar.



A wide variety of design, operational and economic solutions (source: IMO)

The "S" in ESG: Social Responsibility and Decarbonization

The "S" in ESG focuses on social responsibility, which includes ensuring fair labour practices, promoting seafarer well-being, and fostering positive relationship with coastal communities. This includes addressing issues like seafarer training and safety in handling new technologies and fuels.
Leaders must commit to sustainability and make sure everyone understands and is held responsible. They should encourage innovation and align ESG goals with business performance for a fair transition.

The "G" in ESG: Building the Framework for ESG Action

Governance, the "G" in ESG, refers to how companies structure their leadership, policies, and compliance systems to support sustainable practices. In the maritime industry, this means setting clear ESG goals, ensuring transparency in reporting, and holding stakeholders accountable for meeting sustainability targets.

Corporate boards must make ESG a priority for long-term value creation by integrating it into financial decisions, risk management, and supply chain operations.

With investors increasingly seeking companies that align with ESG principles, businesses have a strong reason to follow ESG guidelines.

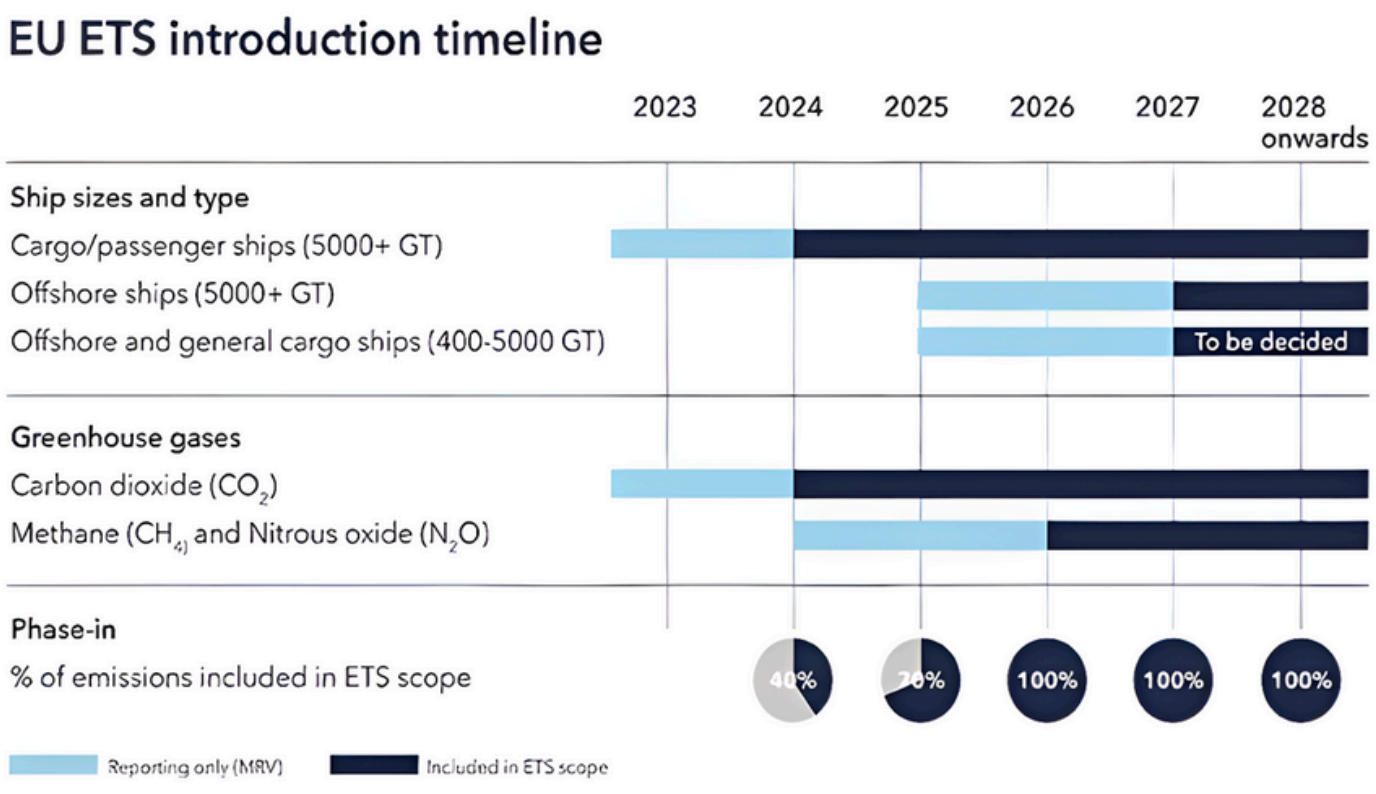
Regulatory Landscape and Industry Initiatives

Governments and industry groups play a key role in driving ESG adoption in the maritime sector.

IMO regulations, like GHG reduction targets and EU ETS (European Union Emissions Trading System) regulations, are driving major change. Alongside these regulations, industry initiatives, such as IMO climate action projects, are promoting collaboration among stakeholders to accelerate the adoption of decarbonization technologies. Pressure from financial institutions and investors further accelerates ESG adoption.

	Initial Strategy (2018) (Tank-to-Wake)	Revised Strategy (2023) (Well-to-Wake: Life cycle)
Vision	Phase out GHG emissions as soon as possible in this century.	Phase out GHG emissions as soon as possible.
Levels of ambition	■ Total annual GHG emissions (compared to 2008) At least 50% reduction by 2050	At least 20% (striving for 30%) reduction by 2030 (Indicative checkpoint) At least 70% (striving for 80%) reduction by 2040 (Indicative checkpoint) Reach net-zero GHG emissions by or around, i.e. close to 2050
	■ Uptake of zero or near-zero GHG emissions technologies, fuels, energy sources	At least 5% (striving for 10%) by 2030
	■ Carbon intensity improvement (CO_2 emissions per transport work) (compared to 2008) At least 40% reduction by 2030 At least 70% reduction by 2050	At least 40% reduction by 2030

2023 IMO GHG Strategy (source: Class NK)



EU ETS introduction timeline (source: DNV)

Greenhouse Gas Projects (Source: IMO)

Challenges and the Road Ahead

Despite progress, significant challenges remain. One of the main barriers is the high upfront costs of adopting sustainable technologies. Additionally, regulatory complexities, and resistance to change pose obstacles.

Conclusion

ESG principles provide a clear roadmap for decarbonizing the maritime sector. However, overcoming the challenges of implementation will require ongoing collaboration, investment in technology, and the development of consistent international standards.
As technology improves and regulations tighten, the maritime industry must speed up its ESG efforts.

Strong leadership is key to implementing ESG principles.
Now it's the time for the leaders to take action to secure a sustainable and profitable future.

About the Author

Mr Sridev Mookerjea, FICS is Chairman - Blossom Group of Companies.

Carrier Liability – Containers

by Jagannath / NAU

1. The NUS Centre for Maritime Law ("CML") recently published a paper on "The Impact of Containerization on Carrier Liability" authored by Mustafa Yilmaz, a research associate with CML. This paper is a must read for claims practitioners involved in containerized cargo given that it discusses the tensions created by use of the outdated legal rules to deal with cargo claims.
2. The paper touches on Container - related cargo loss or damage and broadly categorizes these into two groups - those associated with the physical soundness of the container and those concerning container handling and integrity.
    i. The challenge remains to determine whether the containers used for transportation were fit for purpose (physical soundness) and whether there were any incidents during the voyage/transit which caused loss or damage to the cargo (container handling). We submit that the cargo interests have a concurrent duty to inspect the containers prior to accepting the same for loading of their cargo (unless they are not involved in this part of the shipment - for instance LCL/FCL shipment)[i].
    ii. With respect to losses arising during the transit (container handling), technology[ii] is presently available to ascertain where the loss occurred and whether it was due to any specific stresses (bangs, etc.). Even for reefer containers, data can continuously be transmitted, and which would result in quicker repairs during outages, either by repairing or replacing the equipment. Unfortunately, this technology has only been harnessed by one Carrier, Hapag Lloyd[iii] and therefore it remains to be seen whether other Carriers will also invest to take advantage of data which can be captured instantaneously and provided in real time.
    iii. While there would be a cost for the use of technology, there will be corresponding benefits. One of these would be that parties will now be able ascertain who was at fault and which would, in turn, lead to higher chances of recovery. This information will also assist parties in instituting preventive measures to avoid future recurrence of similar losses. The unfortunate fact in the Shipping Industry is that technological changes generally happen at a very slow pace[iv] and therefore use of Technology should be incentivised by Insurers (both cargo and liability insurers), say by providing a lower premium. Alternatively, cargo interests should demand for the use of technology and should be prepared to bear the minor increase in costs.
3. Period of responsibility: The paper discusses the period of responsibility[v] as provided in the Hague/Hague-Visby Rules and its application to container shipping and for which two cases, Volcafe and The MV Maersk Chennai, were discussed on. As was pointed out, this will be fact and jurisdiction based i.e. some jurisdictions give a wider definition beneficial to the cargo interests whereas other jurisdictions will prefer a narrower application. Our issue with the wider application is that most Carriers have no control over events at the Terminals/Ports and whose contracts with the Carrier may be more restrictive with lower limits and shorter time bars[vi]. This being the case, it would be incorrect to simply make the Carrier the punching bag unless they were at fault.
4. In conclusion, we believe that the use of appropriate technology may aid in the development of law, particularly for container carriage. However, only time will tell whether this actually happens.

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i. See our earlier article, Container Operators - Equipment related issues

ii. See information provided on Smart Containers – The Internet of Cargo The IoT Transformation Company

iii. Hapag-Lloyd starts installation of tracking devices on its dry container fleet - Hapag-Lloyd

iv. See our earlier article on Electronic Bills of Lading - 3 where we had mentioned the slow pace for the adoption of this technology.

v. See our earlier article, Container Issues - CY/CY & Detention

vi. See for instance, The General Conditions of Business of Port of Tanjung Pelapas and which provides for limitation of liability for cargo damage for a sum of RM 55,000 (approx. USD 12,405) for 20'containers and RM 80,000 (approx. USD 18,044) for 40' containers …

Editorial

by Sridev Mookerjea, FICS

We are pleased to bring out our first quarter Newsletter of the year 2025.

One of the significant events of the first last quarter of 2025 is our presence at the Singapore Maritime Week (SMW) and SEA Asia Exhibition & Conferences from 24th March 2025 to 29th March 2025. SMW 2025 reached an unprecedented scale, reinforcing Singapore's position as a leading maritime hub.

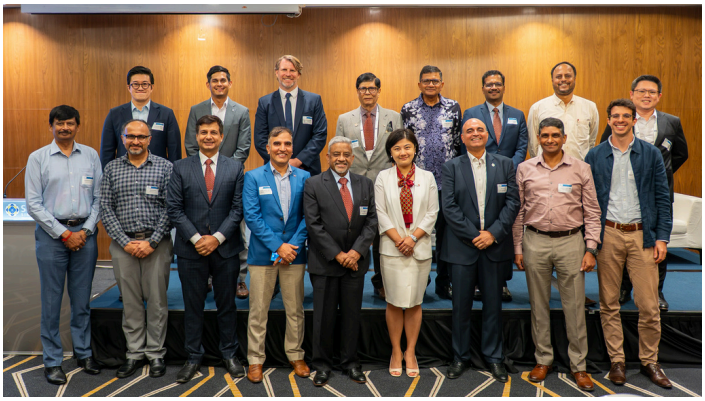
The week kicked off with the Singapore Maritime Lecture by Senior Minister Lee Hsien Loong, who addressed "Adversity into Opportunity: Staying Ahead in a Troubled World." His reaffirmation of Singapore's commitment to openness, trade, and global connectivity was deeply encouraging. ICS Singapore Branch Chairperson Ms Elaine Yu attended the Opening Ceremony, where she met ambassadors from China, the UK, and Italy—a reflection of the strong international interest in SMW.

At the Xinde Marine Forum later that day, Ms Elaine was the moderator at the 'Shipping Market Outlook' panel with Bobby Zhu, Zhongyi (John) Su, Michael Jorgensen, Zhi-Lin Liu, and Arjun Batra.

The Institute of Chartered Shipbrokers (ICS) was honored to participate in the Singapore Chamber of Maritime Arbitration (SCMA) Conference 2025 on the theme of "Charting the Future of Maritime Arbitration in a Fast-Changing & Complex World - Geopolitics, Innovation & Sustainability" where our Chairperson, Elaine Yu Kai attended the forum, and our Vice-Chair, Saunak Rai contributed as a panelist in the discussion on 'Climate Change and Maritime Disputes - Towards a Greener Future. Several of our eminent members also attended the forum. It was an engaging and thought-provoking session, addressing the evolving challenges and opportunities in maritime arbitration as the industry navigates towards sustainability.

A significant milestone at the ICS Shipbroking Forum was the signing of a "Memorandum of Understanding (MOU) between the Maritime and Port Authority of Singapore (MPA) and ICS Singapore Branch. This MOU, signed by Mr Eng Dih Teo, Chief Executive of Maritime and Port Authority of Singapore (MPA) and Ms Elaine Yu Kai, Chairperson of ICS Singapore, marks a strategic collaboration to enhance maritime education, professional development, and industry outreach. The signing further strengthening efforts to nurture the next generation of shipbrokers and maritime professionals.

A big thank you to Mr Saunak Rai for being the Master of the ceremony and to ICS Global President, Mr Punit Oza, for delivered the closing speech, reinforcing the Institute's commitment to shipbrokers worldwide.



The 2nd GREEN4SEA Singapore Forum took place on Friday 28th of March 2025 at the Orchid Main Ballroom, level 4, Marina Bay Sands, Singapore. During the event, experts from various backgrounds of the industry brought their expertise in engaging discussions around the drivers and barriers on the decarbonization of shipping. The event was organized by SAFETY4SEA and supported by Institute of Chartered Shipbrokers (ICS).

At the 2nd GREEN4SEA Singapore Forum, Mr Sridev Mookerjea discussed the integration of ESG principles in driving a sustainable transition within the maritime industry. He outlined key environmental strategies such as alternative fuels, energy efficiency, and emissions reduction, while also emphasizing the social responsibility of supporting fair labor practices and community well-being. Through case studies, Sridev Mookerjea highlighted both

successes and ongoing challenges, stressing that a sustainable maritime future depends on commitment, collaboration, and continuous innovation.

Saunak Rai, Vice Chairman, ICS Singapore Branch, at the Safety4 SEA Panel Discussion. He explored the transition beyond fossil fuels and the role of alternative energy in the maritime sector. He provided insights into the availability and affordability of alternative fuels, outlining various fuel pathways to achieving net-zero emissions. Rai also examined the LNG pathway as a transitional solution, discussing its potential to support the industry's decarbonization goals.

New Members Elected

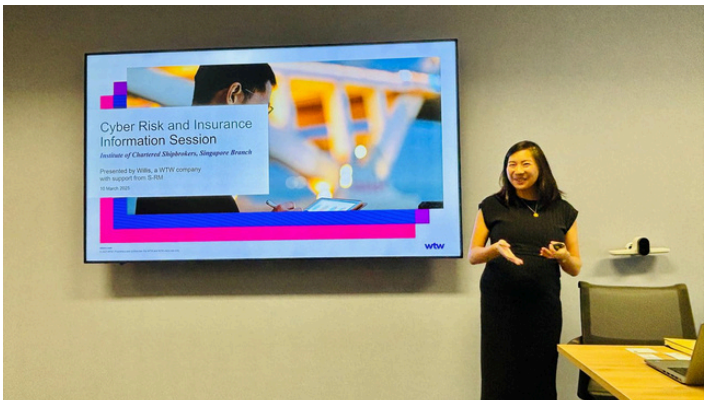
We wish to congratulate the following Members for being elected as Member of the Institute.

- Mr Shiraz Lakhani, MICS
- Mr Jose Galaura, MICS (re-elected)

Professional Talk

On 10 March 2025, we were privileged to host Jennifer Tiang (Regional Head of Cyber Insurance Practice, WTW) and Mark Farley (Head of Proactive Services, Asia, S-RM) for an eye-opening session on cyber risks in the maritime industry.

Highlights included a live cyberattack simulation and actionable strategies to strengthen cyber resilience. The engaging discussion underscored the growing importance of proactive risk management as cyber threats continue to evolve.



Up-Coming Events

9 May 2025 - Women in Maritime Can (A joint event with WISTA and WIMAR)

13 - 22 May 2025 - Institute Exams

TBA - Annual Awards Ceremony

TBA - Annual General Meeting

Member's Benefits

We like to once again highlight the following local benefits of renewing your membership and inspire other eligible candidates to take membership of this prestigious shipping and maritime institute.

In closing, I like to extend my special thanks to Capt. Saunak Rai, Capt. Vinod Dubey, Mr Jagannath Muthu and Mr Nikhil Modak for contributing their articles to this newsletter.

Shifting Alternate Fuel Tanks from Above Deck to Under Deck on Bulk Carriers

Examining the Implications and Benefits for Modern Shipping

by Nikhil Modak, FICS, PGCSCM, EMBA (Finance)

With the approaching goal of Carbon Net Zero, shipping companies worldwide are racing toward alternate fuels. However, as of now, the International Maritime Organization (IMO) has not issued specific directives regarding the type of alternate fuel to be adopted. Consequently, research and development efforts are being carried out by various companies experimenting with a range of alternate fuels, including ammonia, liquefied natural gas (LNG), biofuels, methanol, hydrogen, and even nuclear energy. Some companies have installed solar sails on their ships to enhance efficiency. Despite these efforts, there is no consensus, adequate infrastructure, or sufficient availability of alternate fuels to cater to the vast number of vessels currently navigating the global waters.

At present, ammonia and LNG are among the most popular alternate fuels. The majority of vessel designs incorporate dual-fuel engines, necessitating the storage of both traditional and alternate fuel tanks. While traditional fuel tanks are located below the deck line of the vessel, alternate fuel tanks are typically housed above deck. This arrangement is due to the limited space below deck, as accommodating these tanks below the deck line would reduce the vessel's grain and bale cubic capacity unless the vessel's dimensions—length, breadth, or draft—are altered.

However, housing alternate fuel tanks above the deck line presents significant safety and environmental concerns. This prompted a study to assess the revenue loss due to the reduction in grain and bale capacity for bulk carrier vessels with a deadweight of 82,000 metric tons and above when alternate fuel tanks are relocated from above deck to below deck.

Space Constraints

Bulk carriers are designed with specific cargo capacities in mind, and any modifications to the vessel's internal layout can impact its cargo-carrying capabilities. Shifting alternate fuel tanks below deck would require significant alterations to the vessel's structure, potentially reducing the available grain and bale cubic capacity.

Safety Concerns

The storage of alternate fuels, such as Ammonia and LNG, presents unique safety challenges. These fuels require specialized storage facilities and safety measures to prevent leaks, explosions, or other accidents. Ensuring the safe storage of these fuels below deck would necessitate significant investment in safety equipment and infrastructure.

Operational Efficiency

The relocation of alternate fuel tanks below deck could impact the vessel's operational efficiency. The additional space required for fuel storage may reduce the available cargo space, affecting the vessel's overall carrying capacity and revenue generation.

Potential Benefits of Shifting Alternate Fuel Tanks Below Deck

Despite the challenges, there are several potential benefits to relocating alternate fuel tanks below deck, including:

Enhanced Safety

Storing alternate fuels below deck can enhance the safety of the vessel by reducing the risk of fuel leaks or explosions. This arrangement can also minimize the exposure of fuel tanks to environmental factors, such as harsh weather conditions or external impacts.

Improved Environmental Compliance

Relocating alternate fuel tanks below deck can help shipping companies comply with environmental regulations by reducing the risk of fuel spills or leaks. This move can also contribute to the overall sustainability of the shipping industry by promoting the use of cleaner fuels.

Conclusion

The shift towards alternate fuels is a critical step in achieving Carbon Net Zero and promoting sustainability within the shipping industry. While relocating alternate fuel tanks from above deck to below deck presents several challenges, including space constraints, safety concerns, and potential impacts on operational efficiency, the potential benefits, such as enhanced safety, improved environmental compliance, and increased cargo capacity, make it a viable option for modern bulk carriers.

As the industry continues to explore and adopt alternate fuels, further research and development efforts are needed to optimize vessel designs and ensure the safe and efficient storage of these fuels below deck. Collaboration between shipping companies, regulatory bodies, and technology providers will be essential in overcoming these challenges and paving the way for a more sustainable and efficient future for the global shipping industry.
Hence in our study we have considered potential impact on earnings by shifting the alternate fuel tanks below the deck line. It must be noted that different yard come with different kind of designs in terms of deadweight, breadth, and draft. Usually, the yards will not alter the length of the vessel (i.e. for Kamsarmax vessel would have 225 lengths overall, however the breadth, draft might be altered if Deadweight is changed).

There are few popular designs in the market and our study is based on potential earnings lost due to reduction of Grain capacity if other characteristics of the vessel are unaltered. We have not considered impact of reduction in Bale capacity of the vessel as vessels of this size carry bulk cargo and Bale capacity comes in the picture only when bagged cargoes are carried.

Different yards can come with distinctive designs and the alternate fuel tanks can be housed anywhere below deck (i.e. between hold 2 and hold 3 or hold 4 and hold 5 or in between the last hold and engine room) and even no of holds can be reduced.

Study on housing alternate fuel tanks under deck by reducing Grain capacity of the 82000 mt Kamsarmax / 95000 mt and 105000 mt Post Panamax vessel.

Three tankers damaged by blasts in the Mediterranean in the last month, causes unknown, sources say - Reuters.

An explosion caused a one-meter inward breach below the waterline on the hull of Greek-operated crude oil tanker MT Seajewel at a port in northern Italy on Saturday, one of the shipping sources said. A second blast occurred 20 minutes later the same vessel without causing further damage.

Although above incidents are related to vessels which are conventionally fuelled, the recent explosions on Merchant navy vessels focus is back on safety and one begs to ask the question on the consequences / disasters it can bring if the alternate fuel tanks are targeted / get involved in an accident which are presently housed on the deck of the vessels. These alternate fuels are carried under pressure and even a small dent to the tanks could be dangerous and that some of these fuels are extremely flammable, some form explosive gases and some hazardous to the environment.

Carrying them in tanks on deck have an inherent risk as they can be targetter by unruly elements or easily damaged in case of accidents at port or at sea. Some reports suggest that some of the alternate fuel carried in such tanks have a blast radius of over half a kilometre and the consequences can be unthinkable if there is an accident during port operations.

With increasing geopolitical tensions and privacy activities and taking into consideration above incidents as well as latest accident in North Sea involving an Oil Tanker and a Cargo Ship safety has come into spotlight and it is advisable to house the tanks below deck as relocating them from deck to underdeck will eliminate the risk to a certain degree as the outer hull of the vessel acts as an armour in case of accidents at sea or at port.

I believe few years back a reputed Japanese owner was working on the possibility of relocating the tanks under deck on their Kamsarmax designs but as the Grain Capacity would reduce, they did not proceed ahead with the project. Few months back, I was in touch with a Senior Engineer now retired and acting as a consultant on New Building projects and had the chance to exchange some notes with him on the impact on grain carrying capacity if the storage tanks are housed under deck and further decided to pursue the study on how the reduction of Grain Capacity would affect earnings on a 82000 MT DWT Kamsarmax and Post Panamax vessel.

It needs to be noted here that as cape vessel carries Iron ore and Coal cargoes mostly 150,000 +/-10% parcels there won't be much loss in earning when it comes to capes hence, we have limited our study only to Kamsarmax and some of the new 95,000-100,000 MT DWT Post Panamax.

Study on housing alternate fuel tanks under deck by reducing Grain capacity.

Common commodities for Kamsarmax are Iron Ore, Bauxite, Coal, Fertilizers, Forestry products, Soya Bean Meals (SBM) and Heavy Grains, Soyabean and Sorghums (HSS) where primarily the market is driven by East Coast South America SBM trade and NOPAC HSS and US Gulf Grain trade.

#KAMSARMAX82K
Dwt: 82418 mt, loa: 229.0 mtrs, beam: 32.26mtrs, draft:14.55mtrs, Grain: 94000 CBM

Table (1): Intake based on Grain Carrying Capacity

Grain Capacity	84000 CBM	85000 CBM	86000 CBM	87000 CBM	88000 CBM	94000 CBM
SBM SF 1.5 M3/T	56000 mt	56667 mt	57333 mt	58000 mt	58667 mt	62667 mt
HSS SF 1.36 M3/T	61765 mt	62500 mt	63235 mt	63971 mt	64706 mt	69118 mt
Coking coal SF 1.16 M3/T	72414 mt	73276 mt	74138 mt	75000 mt	75862 mt	81034 mt

From table 1 it can be concluded that reducing the Grain Carrying capacity up to 84000 CBM, it is not affecting the trading capabilities of the vessel. However, the vessel intake for commodities traded on major routes have gone down. We will derive the monetary loss for same in table 2 and table 3.

Note:
Intake of Iron ore and Bauxite will not be affected by reducing Grain carrying capacity as their density is above 0.9 kg/m3 and hence not considered in this study.

Other commodities being carried in Kamsarmax are fertilizers (Potash, Urea, Ammonium Nitrate), Steel products (coils, slabs, etc) and Forestry products (logs, lumber, wood chips) out of which some of the forestry products are voluminous cargoes however considering the trade patters it is not a major commodity being carried in Kamsarmax vessels, hence we will limit our study on effect of reducing Grain carrying capacity (on major trade routes) to SBM (ex ECSA to Far East), HSS (ex NOPAC / US Gulf to Far East) and Coking coal (East coast Australia to Indian Ocean / Far East) in calculating loss of revenue to the owners.

If we extrapolate our results to other routes ex Black Sea to Far East results for Grains cargoes would be around similar range with some degree of error.

Standard trade contracts (letter of credits) for both SBM and HSS are 60,000 mt +/-10%.
Standard trade contracts (letter of credits) for Coking coal are 75,000 mt +/-10%
As the lifting quantity is in Owners Option, we have derived the loss in quantity due to reduction of Grain carrying capacity in the below table.

SBM: - Soya bean meal
HSS: - Heavy Grains (Wheat), Soya and Sorghums

(Table 2): Quantity lost in comparison to intake basis 94000 CBM or max loadable quantity due to draft restrictions or trade contract whichever lower.

Grain Capacity	84000 CBM	85000 CBM	86000 CBM	87000 CBM	88000 CBM	94000 CBM
SBM	6667 mt	6000 mt	5333 mt	4667 mt	4000 mt	66000 mt
HSS	4235 mt	3500 mt	2765 mt	2029 mt	1294 mt	66000 mt
Coking coal	5736 mt	4874 mt	4012 mt	3150 mt	2288 mt	78150 mt

(Table 3): Monetary loss due to reduction of Grain carrying capacity.

Grain Capacity	84000 CBM	85000 CBM	86000 CBM	87000 CBM	88000 CBM	94000 CBM
SBM	$266,667	$240,000	$213,333	$186,667	$160,000	$0
HSS	$127,059	$105,000	$82,941	$60,882	$38,824	$0
Coking coal	$157,746	$134,039	$110,332	$86,625	$62,918	$0

Assumptions:
Trip via EC Australia to India / Far East 45 days
Round trip via East Coast of South America to Far East 90 days
Round trip via NOPAC to Far East 60 days

Note:
It is advisable to take data for last 10 years while deriving average days.
Based on vessels past trading history, companies should decide their trade patterns and based on average days over last 10 years calculate revenue loss in terms of TC hire per day.

In the next table we have given loss of TC hire per day based on above assumption of days needed for the trip and following freight levels.

USD 40.00 pmt for East Coast South America to Far East*
USD 30.00 pmt for NOPAC to Far East *
USD 27.50 pmt for East Australia to Indian Ocean*

* It is advisable to take past 10 years average freight rate / TC levels for this route and extrapolate them to future curves to have meaning full data.

As the scope of this study is to highlight estimated loss of income due to reduction of Grain carrying capacity and lack of data we are not delving deep into same. Additionally, each companies have their own trading patterns and data over last 5 to 10 years and should rely on same for further analysis.

(Table 4): Loss in revenue in terms of TC hire / per day

Grain Capacity	84000 CBM	85000 CBM	86000 CBM	87000 CBM	88000 CBM	94000 CBM
SBM	$2,963	$2,667	$2,370	$2,074	$1,778	$0
HSS	$2,118	$1,750	$1,382	$1,015	$647	$0
Coking coal	$3,505	$2,979	$2,452	$1,925	$1,398	$0

Trade-Off
Reducing Grain Capacity results in revenue loss so there must be an exceptionally good reason (trade-off) in consideration of same.
Presently the ships design housing alternate fuel are as per figure 1.

There are two fundamental issues housing the alternate fuel tanks on deck.

(1) With the added tanks in aft on both the sides there would be resistance resulting in decrease fuel efficiency. However, looking at the figures above believe this is difficult.

(2) Having a high pressurised fuel tank exposed on deck is a safety risk as accidents do happen during port operations and second being drone attacks which have been increased during recent times.

Findings:

Based on our calculations to house alternative fuel tanks under deck:

- total 3000 CBM (1500 CBM x 2 tanks) alternate fuel tank under deck the Grain capacity to approximately 87000 CBM.
  - Dimensions of each tank: 20 meters high x 10 meters diameter - fig below
- total 6000 CBM (1500 CBM x 4 tanks) alternate fuel tank under deck the Grain capacity to approximately 84000 CBM.
  - Dimensions of each tank: 20 meters length x 10 meters diameter

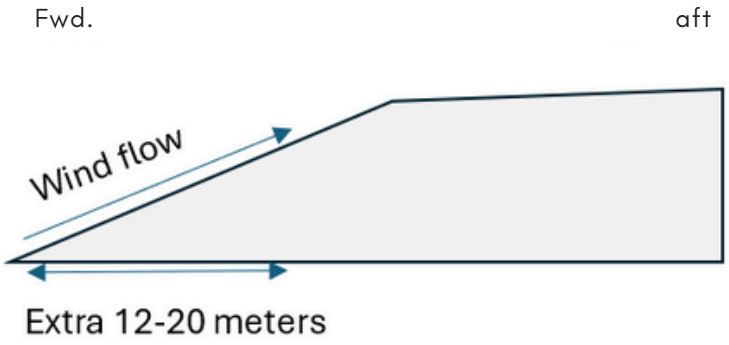
As 3000 CBM methanol as alternate fuel range is 10000 nautical miles, we also need 2000 mt LSFO and 350 mt LSMGO tanks.
In future once the technology/designs and availability of alternate fuel improve we might be able to drop the traditional fuel tanks freeing up more space for larger alternate fuel tanks.

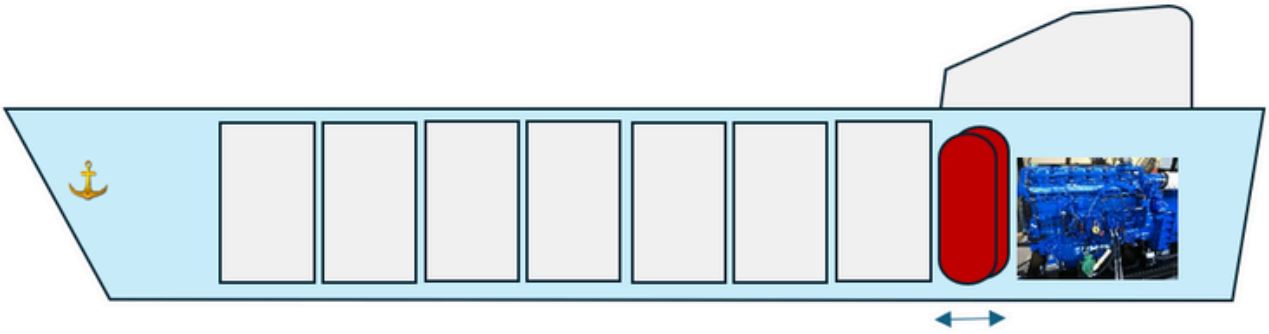
It falls under Naval Architect purview to check for the best configuration and whether these the space freed up by reducing grain capacity could be used after hold no 7 or need to be transferred in front considering the longitudinal stress and stability.

If the tanks could be housed at the aft or aft hold no 7, the bridge accommodation design could be transformed and made more aerodynamic. Instead of rectangular shape as shown is diagram below, with the added freed up space. As the base area increase the above structure can become shorter and with advancement in technology (CCTV) bridge accommodation height could be shortened to reduce the air resistance / drag resulting in more fuel efficiency.

Bridge accommodation side view (traditional)

Bridge accommodation side view (proposed)





Note: there is no compulson to keep 7 holds. If the tanks are housed below deck, instead of 7 holds, designed can be changed to 6 holds as well. Tanks can be housed anywhere (ex between hold 2 and 3 or between hold 4 and 5)

#POST PANAMAX95K
Dwt: 95000 mt, loa: 235.0 mtrs, beam: 38.00 mtrs, draft:14.50mtrs, Grain: 110000 CBM

Table (5): Intake based on Grain Carrying Capacity

Grain Capacity	98000 CBM	110000 CBM
Coking coal (SF 1.16 M3/T)	86206 mt	94827 mt

Vessel is presently designed to Grain capacity of 110000 CBM. If we reduce the grain CBM to 98000 to house the alternate fuel tanks, this kind of post-panamax can still load around 65333 basis 98000 CBM SBM which is better carrying capacity compared to standard 82000 DWT Kamsarmax. She can also take the max 66000 mt HSS.

One issue is with Coal intake as it works out to be around 86206 mt compared to 92000 mt based on the original design. However, most of the Coal cargoes are either 75000 +/-10% or on certain occasions 80,000 +/-10% (Via NOPAC), so the shortfall of 1800 mt can be ignored.

Traditional Post Panamax are calculated at 70% of the 5TC BPI82 index + 30% of the 5TC BCI, however this design should attract premium as they are quite eco and shallow draft allowing them to trade draft restricted grain terminals in ECSA, NOPAC and US Gulf (more data of port restrictions is required). Additionally, when the Cape segment (Iron ore ex ECSA, SAFR, EC Australia) is hot cargo starts getting spill over to post panamax.

#POST PANAMAX100K (Oshima)
Dwt: 100449 mt, loa: 234.96 mtrs, beam: 38.00 mtrs, draft:15.013mtrs, Grain: 115356 CBM

Table (6): Intake based on Grain Carrying Capacity

Grain Capacity	103000 CBM	115356 CBM
Coking coal (SF 1.16 M3/T)	88793 mt	99444 mt

Coal intake as it works out to be around 88793 mt compared to 97000 mt based on the original design. Vessel can load 88000 mt coal after reduction of Grain capacity from 115356 mt to 103000 mt to house alternate fuel tanks.
More study is needed to check if this vessel is suitable for Grain loading ex Atlantic (need ports restrictions data). Iron ore ex ECSA can be loaded fully being high on density.

Disclaimer:
The above should not be considered as any consultant advice. Readers should not act of or rely on any content and should seek professional advice and most importantly do their own research if they want to invest in shipping assets.

About the Author
Nikhil Modak is a shipping professional with 25 years of experience, starting in ship management and later transitioning into shipbroking. He contributed to the management of K-Line vessels with K-Steamship and shifted focus to commercial roles over the past 20 years. His expertise includes working with commodity traders and dry bulk ship owners, serving as GM of Chartering, and acting as a competitive shipbroker. He has experience with Handy-size to Panamax vessels, most recently managing part cargoes and parcels with the Clipper Group, specializing in steel, pipes, fertilizers, and agricultural products in the Red Sea, Persian Gulf, and Indian Ocean regions.