



भारत सरकार / GOVERNMENT OF INDIA
पत्तन, पोत परिवहन और जलमार्ग मंत्रालय
MINISTRY OF PORTS, SHIPPING AND WATERWAYS
नौवहन महानिदेशालय, मुंबई
DIRECTORATE GENERAL OF SHIPPING, MUMBAI

F.No. 13-44012/2/2025-O/o ENGG-DGS (C.No.34075)	Date: 30.04.2025
Subject : Issuance of Guidance Note on IMO's Net-Zero Framework and GFI-Based Measure– Appeal for Proactive Preparedness by Maritime Stakeholders	
Reference	Merchant Shipping Notice No. 4 of 2025
<p>In continuation of India's active engagement at the International Maritime Organization (IMO) and following the approval of the Greenhouse Gas Fuel Intensity (GFI)-based compliance measure at MEPC 83 under MARPOL Annex VI, the Directorate General of Shipping (DGS) has issued a comprehensive Guidance Note titled "Guide to the IMO Net-Zero Framework – Implications for India's Maritime Sector" which is annexed to this notice as <u>Annexure-1</u>.</p> <p>This guidance note has been prepared to enable stakeholders across the Indian maritime ecosystem to understand, prepare for, and comply with the forthcoming regulatory requirements under the IMO's Revised GHG Strategy 2023. The strategy aims to achieve net-zero emissions from international shipping by or around 2050, subject to national circumstances through mid-term measures comprising a technical Global Fuel Standard (GFS) and a market-based GHG pricing mechanism.</p> <p>The GFI-based mechanism, expected to formally come into force in March 2027 and effectively from calendar year 2028, mandates progressive reduction in the lifecycle carbon intensity of fuels used by ships above 5,000 GT engaged in international voyages. The mechanism is applicable to all ships flying the flag of a Party to MARPOL and will have significant operational, economic, and strategic implications for shipowners, ports, training institutes, classification societies, and fuel suppliers.</p> <p>Key Highlights of the Guidance Note:</p> <ul style="list-style-type: none">• Overview of the IMO regulatory timeline and adoption process• Explanation of GFI compliance methodology and its difference from a flat levy• Detailed analysis of cost implications for Indian shipping• India's role, position, and rationale for support• Strategic opportunities for green fuel development and fund access• Stakeholder-specific compliance actions and preparatory steps <p>Action Requested:</p> <p>All stakeholders – including Indian shipowners, managers, port authorities, fuel suppliers, classification societies, and training institutions – are advised to review the Guidance Note in detail and initiate necessary preparatory measures. This includes but is not limited to:</p> <ul style="list-style-type: none">• Monitoring ship-level fuel intensity data• Reviewing procurement strategies for low-GHG fuels• Enhancing technical training on GFI methodologies• Planning green infrastructure upgrades at ports• Engaging with classification societies for early compliance assessment	

The Guidance Note shall serve as an initial orientation document until formal rules and national-level implementation guidance are notified by this Directorate in line with forthcoming IMO decisions.

This Merchant Shipping Notice is issued with the approval of the Director General of Shipping.



(Satish Kamath)

Dy. Chief Surveyor cum Sr. DDG (Tech) (i/c)

To,

1. The Principal Officer Mercantile Marine Department (Mumbai/ Chennai/ Kolkata/ Kochi/ Kandla).
2. All Surveyor-in-charge, Mercantile Marine Department
3. The Indian National Ship-owners Association (INSA)
4. Indian Ports Association (IPA)
5. Foreign Owners Representatives and Ship-manages Association. (FOSMA)
6. Maritime Association of Ship-owners Ship-managers and Agents (MASSA)
7. All Stakeholders/ Shipping Companies through DGS Website.
8. AD (OL) Hindi Cell - with a request to translate this circular in Hindi and upload on DGS website.
9. The Computer Cell, DGS, GOI - with a request to upload this circular on the official website

Copy to :

1. PS to DG(S)
2. Sr.PS to CS
3. Sr.PS to NA(i/c)
4. Sr.PS to CSS (i/c)

ANNEXURE - 1

Guide to IMO Net-Zero Framework Implications for India's Maritime Sector

This document provides a comprehensive analysis of the Frequently Asked Questions (FAQ) on the International Maritime Organization's newly adopted Greenhouse Gas Fuel Intensity (GFI) measure and its implications for India's maritime industry. It explains the regulatory framework, compliance mechanisms, strategic benefits, and implementation requirements for stakeholders across the maritime value chain.



1. What is the role of the IMO in regulating greenhouse gas emissions from ships?

The International Maritime Organization (IMO) is the United Nations' specialized agency responsible for the safety, security, and environmental performance of international shipping. Since 2011, the IMO has adopted several technical and operational measures, including the Energy Efficiency Design Index (EEDI), Ship Energy Efficiency Management Plan (SEEMP), and the Carbon Intensity Indicator (CII). The approval of Mid-Term Measures consisting of a technical element and economic element like the Global Fuel Standard (GFS) represents the third phase of action, focusing on phased reduction of GHG intensity of fuels and economic incentives to accelerate decarbonization.

2. How did the IMO process evolve toward adopting the GFI measure?

The decision to approve IMO Net-Zero Framework was the outcome of over 15 years of deliberations at the IMO, beginning with the GHG discussions in 2008. The 2018 Initial GHG Strategy called for possible development of MBM by 2030, which was reaffirmed and updated in the 2023 Revised Strategy. The revised Strategy stated that Mid-Term Measure consisting of Global Fuel Standard and GHG pricing mechanism should be approved by the committee by 2025. Several rounds of Intersessional Working Group meetings and three MEPC sessions were held before consensus emerged around the two-tier GFI proposal. India's active engagement helped shape a balanced and equitable final outcome.

3. What is the GFI-based measure adopted by the IMO, and what does it aim to achieve?

The Greenhouse Gas Fuel Intensity (GFI)-based measure, approved at MEPC 83 in April 2025, is a GHG reduction mechanism requiring ships above 5,000 GT on international voyages to progressively reduce the GHG intensity of fuels used while the integrated GHG pricing mechanism promotes energy transition of international shipping while contributing to level playing field and a just and equitable transition. It is aligned with the IMO's Revised GHG Strategy (2023), which targets net-zero emissions from international shipping by or around 2050. It aims to incentivize decarbonization via fuel efficiency, green fuel adoption, and climate-equitable cost distribution.

4. What is the GFI in simple terms?

The GHG Fuel Intensity (GFI) is a metric that represents the amount of carbon dioxide (CO₂) equivalent emitted per unit of energy (measured in grams of CO₂ equivalent per megajoule) from marine fuels used by ships. The IMO has set progressive GFI limits, and ships are expected to stay within these limits or face compliance costs. Fuels such as green hydrogen, ammonia, and methanol typically have much lower GFI values, making them attractive under the new regime.

5. What were the three major proposals considered at the IMO for market-based measures?

The IMO considered three key proposals in run up to MEPC 83 to regulate GHG emissions from ships through GHG pricing mechanism. The first was the European Union's flat carbon levy proposal, which called for a uniform levy of USD 100 per tonne of CO₂ emitted, primarily to create a price signal but without an equitable redistribution mechanism. The second was the SIDS (Small Island Developing States) proposal, which suggested a higher flat levy of USD 150 per tonne of CO₂ with revenue redistribution extending even outside the maritime sector, particularly to support climate-vulnerable countries. The third was the India-Singapore Two-Tier GFI-based proposal, which introduced a performance-linked approach with remedial unit pricing at USD 100 (Tier 1) and USD 380 (Tier 2), and included provisions for equitable revenue redistribution and rewards for low-emission ships. India supported this model for its balanced approach, equitable cost burden, and alignment with developing country priorities. as it was the only one that capped compliance costs, aligned with green fuel incentives, avoided flat taxes, and ensured climate equity.

6. How does the two-tier GFI compliance mechanism work?

Ships are evaluated annually (calendar year) based on their GFI performance against a reference trajectory. Those exceeding the intensity limit must buy Remedial Units priced at:

- **Tier 1:** USD 100 per tonne of CO₂ equivalent for mild non-compliance
- **Tier 2:** USD 380 per tonne of CO₂ equivalent for significant non-compliance.
- Ships that perform better than required can generate Surplus Units, which are tradable or eligible for rewards under the IMO incentive scheme.

7. When will the GFI measure become enforceable, and what is the amendment timeline?

The GFI regulation is expected to enter into force in March 2027, subject to the IMO amendment process under MARPOL Annex VI:

- Accepted for circulation at MEPC 83 (April 2025)
- To be formally adopted at an Extraordinary MEPC Session in October 2025
- A 10-month deemed acceptance period follows, with entry into force 6 months after that, unless formally objected by one-third of parties representing 50% of global tonnage.
- Expected to come into force by March 2027.

8. How is the GFI methodology different from a traditional levy?

Unlike a flat carbon levy, which imposes a uniform charge on every tonne of CO₂ emitted regardless of ship performance, the GFI methodology is based on the actual GHG emission intensity of fuels used by a ship. It creates a performance-linked system where compliant ships are rewarded and only non-compliant ships face costs through the purchase of remedial units. This allows flexibility, supports innovation, and ensures that efficient ships and early adopters of green fuel are not penalized—making it more equitable for developing countries like India.

9. How does the Two-Tier GFI proposal offer a better deal for India?

From India's perspective, the Two-Tier GFI proposal provides a more flexible and economically viable solution compared to the flat levy systems. It limits the country's compliance cost to under USD 100 million annually, in stark contrast to the estimated USD 1.5 to 2.4 billion annual impact under the flat levy approaches. The model enables India's efficient ships to generate tradable surplus units and rewards early adopters of clean technology. It is also closely aligned with India's national green fuel targets and unlocks access to a projected USD 27.5 billion global climate transition fund, offering both financial support and strategic leadership in shaping implementation mechanisms.

10. What was the global voting pattern on the GFI measure, and where did India stand?

At MEPC 83, the GFI measure received support from 63 out of 104 participating IMO Member States, surpassing the threshold required for approval. Sixteen countries, primarily fossil-fuel-exporting nations like Saudi Arabia and Russia, opposed the proposal. Twenty-two countries, largely Small Island Developing States (SIDS), abstained due to concerns over the restricted scope of revenue utilization. India voted in favour of the measure, recognizing that its support would not alter the outcome but would enable India to participate in shaping future governance, compliance rules, and fund distribution mechanisms. Abstaining or opposing would have reduced India's influence in subsequent negotiations, especially regarding fund access and technology cooperation frameworks.

11. Why did India support this proposal?

India backed the two-tier model as it:

- Offers differentiated pricing based on ship efficiency (rewarding compliant ships)
- Poses no fiscal outgo for the Government of India
- Aligns with India's green fuel push (e.g., green hydrogen and ammonia)
- Provides access to a projected USD 27.5 billion/year global climate fund
- Avoids severe cost inflation from flat levy models
- Enhances India's diplomatic role in fund governance and rule shaping.

12. Would India's opposition or abstention have changed the outcome?

No. The proposal was adopted with support from 63 of 104 countries. Opposition would have isolated India diplomatically and denied it the chance to influence revenue redistribution and governance mechanisms.

13. How many Indian ships are subject to this regulation?

Out of India's fleet of 1,524 registered vessels, only 212 ships (13.9%) qualify as foreign-going and above 5,000 GT. Of these, around 135 ships are regularly engaged in overseas trade and would be subject to GFI compliance.

14. What is the estimated compliance cost for India's fleet?

The total compliance cost is projected at USD 87–100 million annually by 2030, assuming partial reliance on remedial units. This is equivalent to a ~14% increase in fuel cost and ~5% increase in freight rates—well within industry operating margins.

15. How does this compare with the flat levy proposals from the EU and SIDS?

Flat levy proposals (USD 100–150/tCO₂e) would have imposed a burden of USD 1.5–2.4 billion annually on India's EXIM trade, with freight cost increases of 20–30%, disproportionately affecting steel, fertilizers, and petroleum exports. In contrast, the adopted GFI model offers predictable, performance-based compliance with cost burden capped under 1% of national maritime trade value.

16. Are coastal and domestic Indian ships affected?

No. 100% of coastal and domestic ships are exempt from the GFI regime. Only foreign-going vessels above 5,000 GT are covered.

17. How does this mechanism benefit India's green fuel sector?

India's target of 5 MMT of green hydrogen by 2030 enables production of 28 MMT of ammonia and 26.3 MMT of methanol, which qualify under the IMO's GFI reward system. Green fuels with lifecycle emissions ≤ 19 gCO₂e/MJ earn compliance credits and shipping rewards, boosting India's export potential and investment in clean bunkering infrastructure.

18. Can Indian ships generate revenue from surplus units?

Yes. Indian ships that operate well below the IMO's prescribed GHG Fuel Intensity (GFI) limits can generate tradable surplus units under the new compliance framework.

19. Is the GFI-based system managed by the Government of India?

No. It is an IMO-administered global mechanism. Indian shipowners comply directly through data reporting, performance verification, and purchase/sale of units.

20. What are India's strategic gains from this engagement?

- Access to climate funds for R&D, infrastructure, and transition
- Early mover advantage in green fuel trade and green shipping corridors
- Preservation of export competitiveness by avoiding punitive flat levies
- Strengthened leadership among developing countries in global climate governance.

21. What are the compliance obligations for Indian shipowners?

Indian shipowners operating foreign-going vessels above 5,000 GT must annually report fuel consumption, voyage data, and carbon intensity metrics through standardized IMO Data Collection Systems. Vessels exceeding GHG intensity thresholds must purchase remedial units, while high-performing ships may claim surplus unit credits. Compliance will be verified by the Flag State and submitted to the IMO registry.

22. What preparations are required at the national level for smooth implementation?

The Directorate General of Shipping, in collaboration with the Ministry of Ports, Shipping and Waterways, is preparing operational guidelines, compliance templates, and capacity-building frameworks. Indian maritime training institutions (IMU and MTIs) will integrate GFI awareness into pre-sea and post-sea training. Ports are being encouraged to plan infrastructure for green bunkering and digital inspection protocols to streamline compliance verification.

23. How will the revenue from GFI compliance be used globally, and can India benefit?

Revenue from the sale of remedial units will be pooled into the IMO Net-Zero Fund. This fund will support capacity-building, green shipping incentives, technology deployment, and infrastructure upgrades in developing countries. India, as a large developing economy with high green fuel potential, can access this fund to advance port electrification, ship retrofitting, and domestic fuel innovation programs.

24. What is the role of Indian ports in supporting GFI compliance?

Ports such as Mumbai, Kandla, Paradip, and Cochin are being explored as green fuel bunkering hubs. Shore power, digital GHG inspection systems, and clean fuel availability will support visiting compliant ships and help earn credits. Aligning port operations with the GFI reward system can also enable Indian ports to attract more green-certified traffic.

25. Are Indian seafarers expected to undergo additional training under this regulation?

Yes. Indian seafarers operating foreign-going vessels will require awareness and operational knowledge of GFI reporting, fuel lifecycle characteristics, remedial unit tracking, and voyage planning for emission optimization. DGS will be working on modular curriculum updates and industry workshops to prepare the workforce.

26. How will the IMO ensure fair enforcement and prevent manipulation?

GFI data will be verified using third-party audit and flag state verification under standardized IMO-approved lifecycle emission methodologies. Shipowners manipulating data or non-compliant in remedial unit settlement may face port state control actions and denial of certification. The digital registry will enhance transparency and tracking of unit transfers.

27. What mechanisms exist for reviewing and refining the GFI system post-implementation?

The IMO has committed to a continuous improvement cycle. Reviews are expected every 3–5 years to reassess fuel benchmarks, pricing tiers, trade impacts, and technology readiness. Member states, including India, can submit proposals to improve fairness, funding allocation, or compliance enforcement based on operational experience.

28. How does this measure align with India's broader climate and trade goals?

The GFI framework supports India's National Hydrogen Mission, Bioenergy Roadmap, and Maritime Vision 2030. It enables green fuel export, trade competitiveness, and reduced fossil fuel dependency, while reinforcing India's leadership in equitable global climate policy.

29. What are the implications for Indian exporters using foreign-flagged vessels?

Exporters chartering foreign ships will indirectly bear additional freight cost if vessels are non-compliant. However, under the GFI system, compliant vessels will be more cost-competitive. Indian exporters are encouraged to factor GHG compliance in chartering decisions to minimize long-term freight inflation risks.

30. How is India influencing post-adoption implementation at the IMO?

India is actively participating in working groups on compliance protocols, fund governance, and green fuel eligibility under the IMO. It is advocating for transparent rules, fair treatment of developing nations, and reward mechanisms that align with India's strengths in biofuels and green hydrogen.

31. Can the GFI mechanism drive innovation in India's shipbuilding sector?

Yes. Indian yards are exploring retrofitting solutions and green ship designs. The regulation incentivizes demand for dual-fuel ships, alternative propulsion, and emission monitoring systems—creating new opportunities for domestic innovation and international competitiveness.

32. Is there coordination with other international frameworks like UNFCCC or ICAO?

Yes. The Ministry of Environment, Forest and Climate Change (MoEFCC) is involved to ensure alignment with India's UNFCCC goals. Similar carbon intensity frameworks in aviation (ICAO CORSIA) are being studied to ensure consistency in India's global transport decarbonization strategy.

33. Is the GFI measure mandatory for India? What happens if India does not comply?

Though as a sovereign country India technically retains the discretion to refrain from implementing the GFI measure, once it enters into force under MARPOL Annex VI—as expected around 2028—it becomes binding on all Parties that have not objected under the treaty’s amendment mechanism. Importantly, while domestic and coastal shipping is exempt, the regulation will effectively become mandatory for Indian ships engaged in international trade. Failure to implement could result in Indian-flagged foreign-going ships facing denial of entry at ports of Signatory countries, exposure to regional measures like the EU ETS, reputational damage, and reduced competitiveness. Moreover, India’s non-participation could curtail its access to revenue redistribution from the projected USD 27.5 billion global climate fund and weaken its influence in shaping future IMO governance. Hence, India, as a responsible maritime nation and committed Party to MARPOL, is fully engaged in preparing for its timely and effective implementation.

34. What are the key compliance requirements for Indian shipping companies?

Shipping companies operating foreign-going vessels above 5,000 GT will need to calculate and report the fuel intensity (GFI) of each vessel annually. Non-compliant vessels must purchase remedial units at defined rates. Companies will also need to maintain SEEMP plans with GHG performance strategies, invest in fuel-efficient technologies, and consider voyage optimization. Ships with better-than-required performance may generate tradable surplus units, which can be sold or banked.

35. What role will Indian ports play in the implementation of the GFI regime?

Indian ports will be instrumental in enabling green fuel availability, shore power connectivity, and compliance support infrastructure. Ports such as Mumbai, Kandla, and Paradip are being identified for potential green bunkering hubs. Port authorities may also integrate GFI-linked performance incentives, emissions monitoring infrastructure, and just-in-time arrival systems to align with IMO’s green port aspirations.

36. What actions are expected from marine fuel suppliers in India?

Fuel suppliers will need to offer fuels that meet or outperform the IMO's defined GFI thresholds. This includes expanding supply chains for low-GHG fuels like green ammonia, methanol, biofuels, and LNG. Suppliers will also need to provide accurate emissions data for each fuel batch and prepare for third-party verification Well to Tank Life Cycle GHG Emissions . Collaboration with ports and regulators will be vital for ensuring traceability and conformity with IMO-approved lifecycle emission methodologies.

37. Will shipyards and technology providers in India have a role in supporting this transition?

Yes. Indian shipyards such will play an important role in retrofitting existing vessels to improve fuel efficiency and developing new designs that can operate on low or zero-emission fuels. Equipment manufacturers, software developers, and clean tech providers will also have opportunities to deliver emission monitoring systems, voyage optimization tools, and alternative propulsion systems to meet GFI targets.

38 How are maritime training institutions in India expected to respond?

Maritime training institutions including IMU and its affiliated MTIs will be required to update their syllabi to include knowledge of GFI methodology, carbon intensity monitoring, use of green fuels, emission accounting, and compliance reporting. This ensures that Indian seafarers are fully trained and competent to operate in the GFI-regulated global shipping environment.

39. Will the implementation of the GFI measure affect India's shipping competitiveness?

The GFI-based system is designed to minimize trade disruption and offer flexibility. Indian ships that are already fuel-efficient or converted to run on green fuels will be more competitive. In contrast to flat levies, the GFI structure allows Indian operators to reduce costs through operational improvements, helping preserve and even improve India's competitiveness in global shipping.

40. What is the role of classification societies in the GFI regime?

Classification societies like IROclass and international bodies such as Lloyd's Register and DNV will assist in verifying GFI compliance data, conducting fuel assessments, validating remedial and surplus unit claims, and supporting shipowners in technical assessments and modifications needed to meet GFI benchmarks.

41. How is lifecycle GHG intensity of fuel (well-to-wake) determined under the GFI framework?

The IMO will adopt internationally accepted lifecycle assessment (LCA) methodologies to assess fuel intensity from extraction to combustion (well-to-wake). This includes emissions from production, transport, storage, and use. Fuels such as green hydrogen, ammonia, and methanol produced using renewable energy typically meet the required benchmark of $\leq 19 \text{ gCO}_2\text{e/MJ}$.

42. Is there a possibility that the GFI thresholds or pricing could change in the future?

Yes. The IMO has committed to a regular review cycle for GFI thresholds, pricing levels for remedial units, and reward schemes. Reviews are expected every 3–5 years, and adjustments may be made based on market dynamics, technology developments, and climate targets. India, as an active member of the IMO, will continue to contribute to these negotiations.

For further details : skamath-dgs@gov.in