Charting the course

Unlocking the Potential and Challenges of IMO's Net-Zero Framework for Maritime Decarbonization

SEAS AT RISK

Contents

What Was Agreed? 3

The Framework Falls Short 6

Four Significant Wins 8

What Can Still Be Achieved Through The guidelines 9

Conclusion and Recommendations for IMO Delegations and Policymakers 11

References 12

At its 83rd session in April 2025, the International Maritime Organization (IMO) agreed on a draft "Net-Zero Framework" to regulate greenhouse gas (GHG) emissions from ships. This new framework introduces a global fuel intensity standard, a dual compliance mechanism combining GHG pricing and credit trading, and establishes the IMO Net-Zero Fund.

The agreement is historic. If adopted at MEPC 84 in October 2025, it will mark the first legally binding global GHG regulation for any sector. However, while the regulatory text is now closed, a lot hinges on the implementation guidelines still in negotiation.

These guidelines represent a critical opportunity to ensure the framework delivers more in terms decarbonization and supports a just transition, rather than embedding structural inequality and cost-avoidance mechanisms.

1. What Was Agreed?

The framework applies to ships above 5,000 gross tonnage (GT), starting in 2028, and is structured around a dual-tier GHG compliance mechanism or a 2 tier mechanism:

Dual-Tier Compliance Mechanism

Tier 2 (Base Target): Ships exceeding this GHG intensity must pay a high penalty (Tier 2 Remedial Units (RU) at $380/tCO₂e).

Tier 1 (Direct Compliance): Ships below this threshold earn Surplus Units (SUs), which can be traded or banked for two years.

Scenario	Outcome	Compliance Action
Overcompliance	Below Tier 1	Earn and trade/bank SUs
Partial Compliance	Between Tier 1 and Tier 2	Pay Tier 1 RU ($100/tCO₂e) or use SUs
Non-Compliance	Above Tier 2	Pay both Tier 1 and Tier 2 RU or use SUs

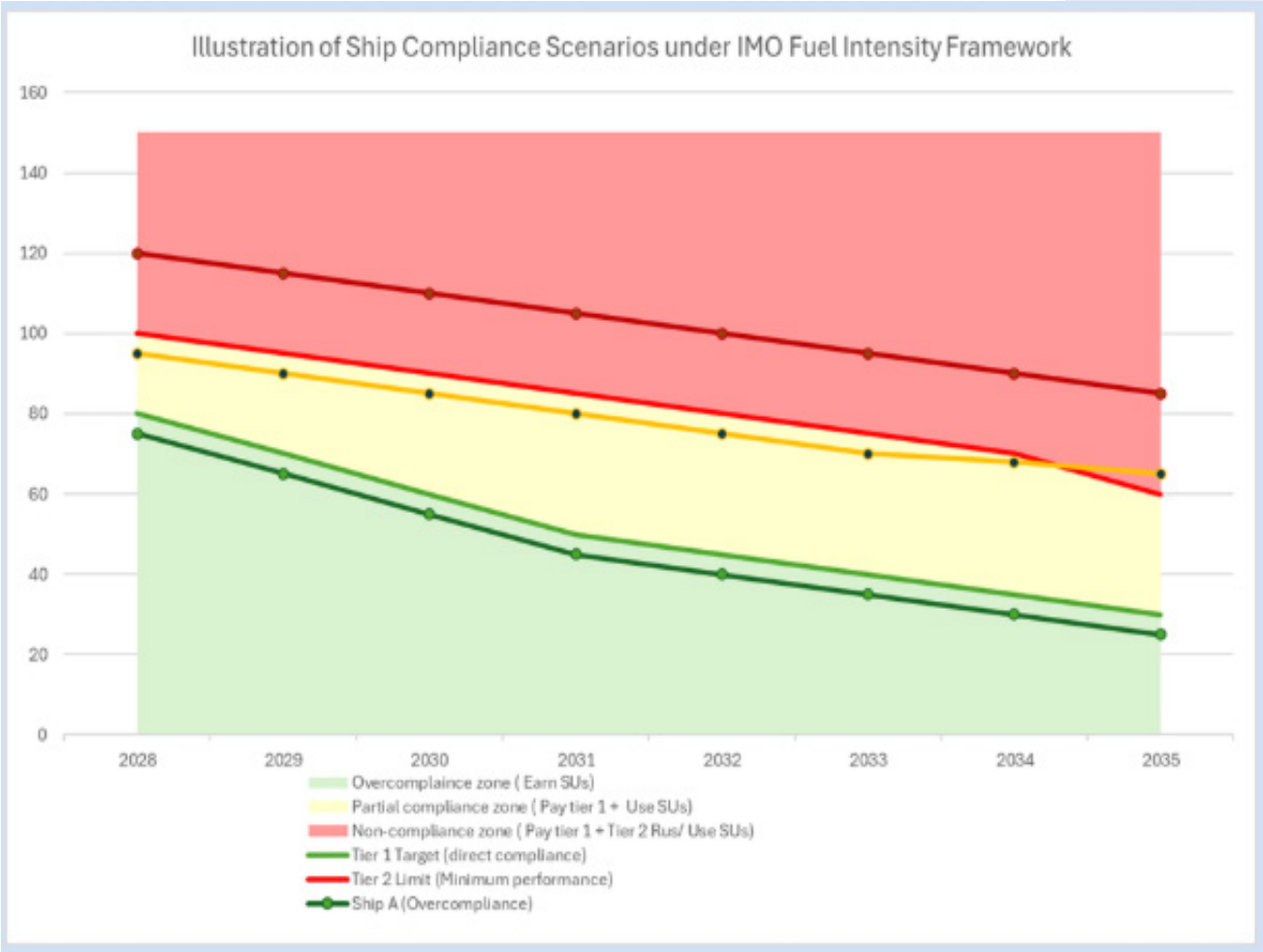


Illustration of Ship Compliance Scenarios under IMO Fuel Intensity Framework
160
140
120
100
80
60
40
20
0
2028
2029
2030
2031
2032
2033
2034
2035
Overcomplaince zone (Earn SUs)
Partial compliance zone (Pay tier 1 + Use SUs)
Non-compliance zone (Pay tier 1 + Tier 2 Rus/ Use SUs)
Tier 1 Target (direct compliance)
Tier 2 Limit (Minimum performance)
Ship A (Overcompliance)

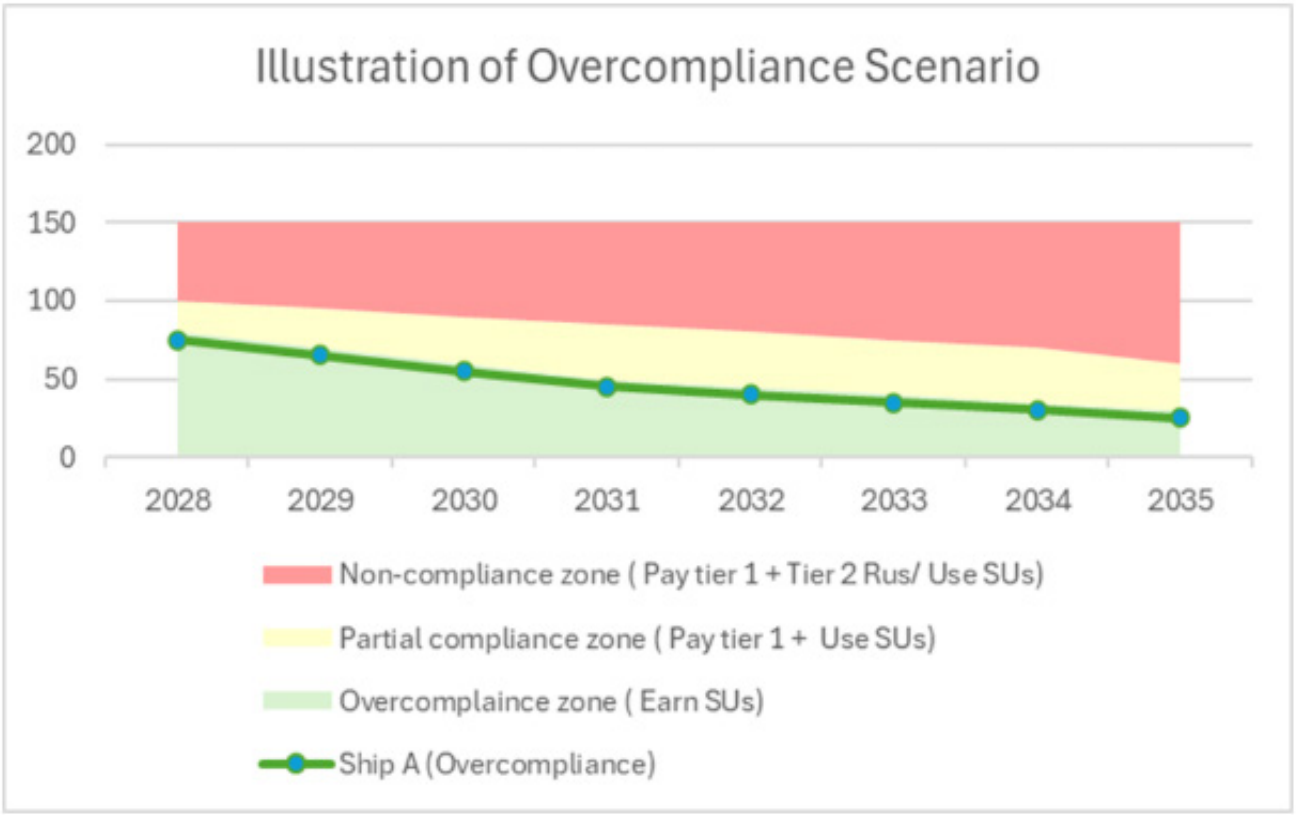
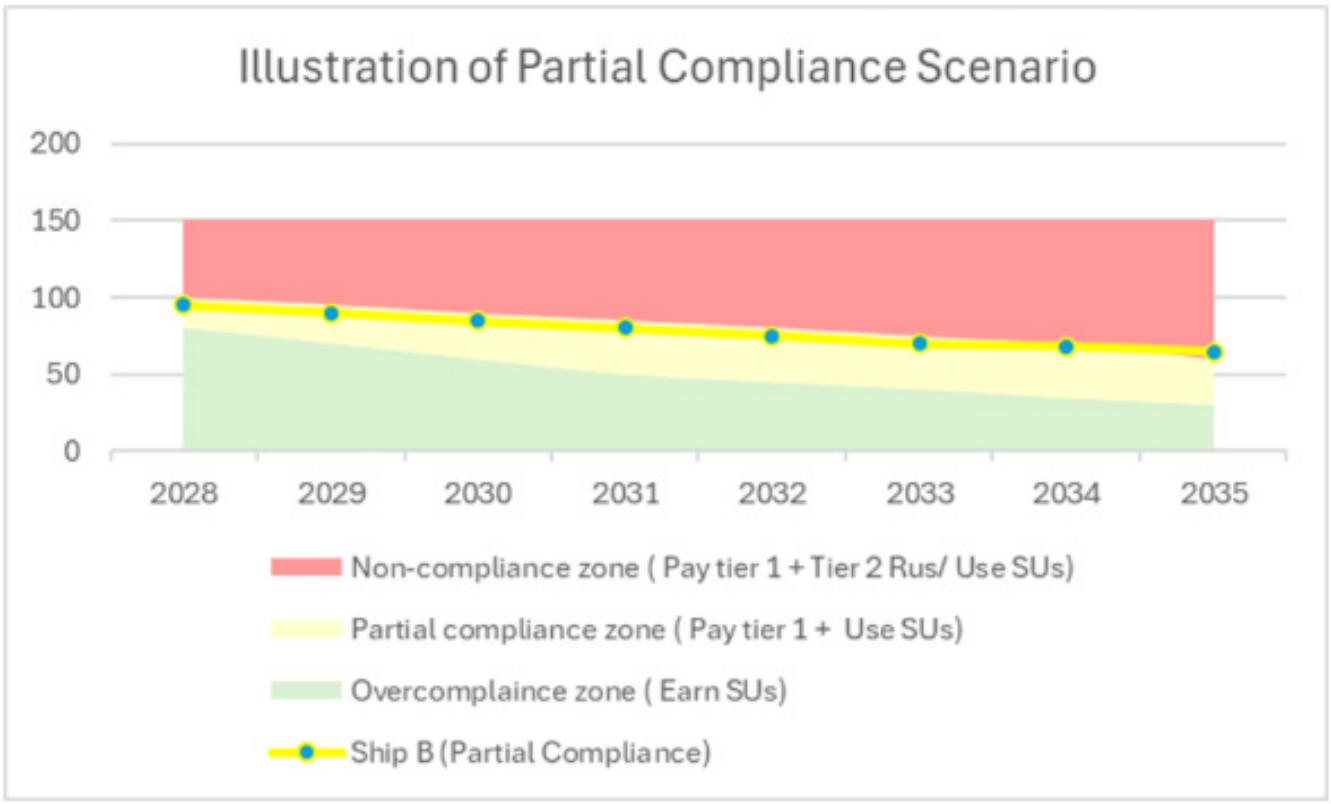
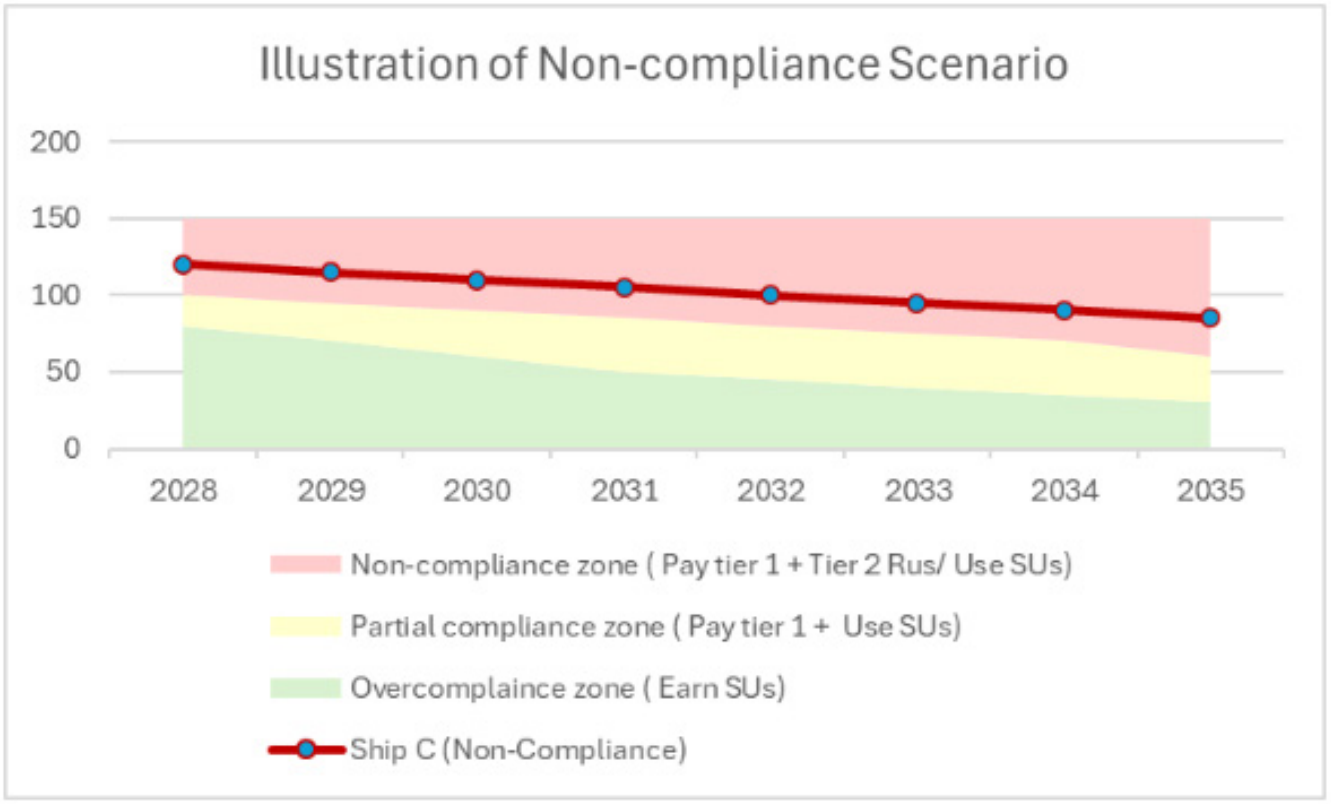


Illustration of Overcompliance Scenario
200
150
100
50
0
2028
2029
2030
2031
2032
2033
2034
2035
Non-compliance zone (Pay tier 1 + Tier 2 Rus/ Use SUs)
Partial compliance zone (Pay tier 1 + Use SUs)
Overcomplaince zone (Earn SUs)
Ship A (Overcompliance)





The mechanism is underpinned by the IMO Net-Zero Fund, financed through RU payments. Regulation 41 establishes a binding structure, once adopted, for how the revenues from this Fund must be used.

2. The Framework Falls Short

The IMO's Net-Zero Framework is a step forward, but on its current trajectory, it will not deliver emissions reductions at the scale or speed required to meet even the IMO's Revised GHG Strategy. Based on IMO working documents and independent modelling (e.g., UCL, T&E, DNV), the expected reduction by 2030 s only around 10% relative to 2008, far below the 20–30% IMO target.

This gap stems from both design limitations and market dynamics—especially around fuel costs and incentives.

Key Reasons for Underperformance

The Coverage Gap: The framework includes Large ships only

The framework only applies to ships over 5,000 GT, excluding smaller vessels that represent approximately 5–15% of global emissions. This leaves out much of the short-sea, regional, and domestic fleets—especially in developing countries—where transition support is most needed.

Weak Early-Year Incentives and Delayed Stringency

The Tier 1 and Tier 2 GHG intensity targets are not ambitious in early years, and compliance flexibility (via Surplus Units or Remedial Units payments) allows companies to delay investment in efuels or newbuilt vessels until well after 2030.

No Cap or Phase Out on Fossil Fuels

The regulation does not mandate a fossil fuel phase-out or restrict the use of fossil LNG or other high-emission transitional fuels. This risks locking in technologies, infrastructure and supply chains that are incompatible with a full decarbonization pathway.

Revenue Too Low to Support Scale-Up

The expected revenue from RU payments (~$10–12 billion per year in the early phase) is unlikely to be sufficient to support both the large-scale deployment of ZNZ fuels and the infrastructure needed in developing countries. Without additional finance, public subsidies or clearer prioritization, these competing needs may crowd each other out.

The Tier 2 RU Price Is Not Enough to Incentivize E-Fuels

The Tier 2 penalty of $380 per tonne of CO_2e may sound like a strong signal—but it's not nearly enough to make zero-emission fuels attractive, especially in the 2028–2035 period.

The Problem is that e-fuels are in all likelihood going to remain much more expensive than transition fuels or fossil based fuels without adequate financial support. For example - Today, producing fuels like e-hydrogen and e-methanol costs far more than using fossil fuels:

- E-methanol: ~$600–900 per tonne of CO_2e avoided
- E-hydrogen (used directly or to make other fuels): typically over $1,000/t$CO_2e$

Fossil marine fuels like Very Low Sulphur Fuel Oil (VLSFO)—the main fuel used by ships today—cost around $500–700 per tonne, which equates to about $160–225 per tonne of CO_2 emitted. In contrast, e-methanol costs $600–900 per tonne of CO_2 avoided, meaning there's a significant cost gap. A $380/t$CO_2e$ penalty helps, but it still leaves a shortfall of several hundred dollars per tonne—too wide to trigger early investment in e-fuels without additional support, like subsidies being put into place.

In Practice

- Ships can remain compliant with fossil or marginally improved fuels and simply pay the Tier 2 RU—or avoid it altogether by using banked credits.
- Investors lack confidence in future fuel returns, slowing financing for new e-fuel production capacity.
- No long-term price trajectory is established, which undermines predictability for infrastructure developers, ports, and fuel suppliers.

In short, while the framework penalizes non-compliance, it does not yet create a strong enough positive incentive to close the cost gap and trigger the scale-up of transformative fuels.

3. Four Significant Wins

The framework includes four significant wins which are the well-to-wake accounting, the Co2 equivalent metrics as opposed to CO2 only, the somewhat inclusive revenue redistribution possibilities and the limits on credit trading.

Well-to-Wake Accounting

The framework's adoption of a well-to-wake life-cycle approach ensures that all upstream emissions—such as fuel extraction, production, and transport—are included. This prevents transition fuels from being falsely categorized as "clean" based on tailpipe emissions alone in the later years of the transition.

CO_2-Equivalent Metrics

The regulation uses a CO_2e basis for measuring GHG emissions, rather than CO_2 alone. This captures potent short-lived gases like methane and nitrous oxide, which are especially relevant for evaluating fuels like LNG and ammonia. It enhances scientific accuracy and avoids perverse incentives.

Revenue Redistribution (Regulation 41)

Regulation 41 sets a binding structure for how the IMO Net-Zero Fund must disburse revenues. It uses the legal phrase "shall disburse," making redistribution obligatory, not discretionary once adopted in October.

Three permitted uses are identified:

(1) Rewards for ZNZ Fuel Uptake

Funds must directly reward the use of ZNZ fuels, reinforcing a market-based compliance structure linked to fuel performance.

(2) Just and Equitable Transition

This clause includes:

- Scope limits: Funding must fall within the boundaries of the "energy transition in shipping."
- A focus on developing countries, especially Least Developed Countries and Small Islands Developing States.
- Eligible areas: Research and development, port infrastructure, seafarer training, capacity-building, National Action Plans, and mitigation of negative impacts (e.g., food security).

(3) Administrative Costs

Revenue may also cover operational needs of the Fund and its governance structure.

This structure embeds both climate ambition and equity into international law, but lacks specific allocation rules, which must now be addressed in guidelines.

Built-in Limits on Credit Trading

The framework includes important safeguards that prevent over-reliance on credit trading and preserve environmental integrity:

- **Two-year validity cap:** Surplus Units can only be banked for up to two years, after which they expire. This avoids credit hoarding or delayed compliance.
- **Performance-linked issuance:** Surplus Units (Sus) are only issued to ships that exceed Tier 1 performance. This means that SUs are only awarded to ships that outperform the most ambitious emissions target, ensuring rewards go to real overachievers—not those just meeting the minimum. It keeps the system focused on genuine emissions cuts, not financial shortcuts.
- **Tiered pricing**: The higher Tier 2 RU cost ($380/ tCO_2e) helps prevent a long-term 'pay-to-pollute' approach by making credit use more expensive over time, but the price level is still too low to drive widespread adoption of high-cost e-fuels, encouraging only transitional options like biofuels and LNG.

These constraints help maintain price stability, discourage market speculation, and reinforce the framework's short-term compliance focus. They also support cost predictability for operators and strengthen investment signals for actual ZNZ technologies.

4. What Can Still Be Achieved Through the Guidelines

With the regulatory text closed, the guidelines process, starting in October 2025 – if the Net zero framework is adopted- is the only remaining avenue to shape implementation outcomes. Several legal and policy opportunities remain.

Strengthen Equity Through Operational Guidance

Implementation guidelines can help ensure the IMO Net-Zero Fund supports a just and equitable transition—especially for climate-vulnerable countries. Specific recommendations include:

- **Define minimum revenue shares for SIDS and LDCs**

Allocating a portion of revenues specifically to Small Island Developing States (SIDS) and Least Developed Countries (LDCs) would help ensure funding reaches those most in need of support for maritime transition.

However, this must be carefully framed. While the IMO recognizes the principle of a just and equitable transition (as reflected in Regulation 41), its legal framework is also grounded in non-discriminatory treatment of flag States. Creating fixed minimum shares for certain country groups could potentially be challenged as unequal treatment unless justified as implementation of the "just and equitable transition" clause.

This is a legal grey area. Such provisions should be designed to reflect differentiated needs and capacities, not to create legal exemptions or exclusive rights.

- **Clarify scope of eligibility under just and equitable transition**

For example, explicitly including food security, climate risk mitigation, and just transition programs could ensure funds are used where they have the greatest impact.

- **Ensure governance representation for vulnerable states on the Fund's board**

Formal representation for SIDS and LDCs would help align funding decisions with real-world transition needs.

- **Allow direct access modalities to reduce barriers for low-capacity applicants**

Direct access lets local institutions in SIDS or LDCs apply for and manage funding without relying on large international intermediaries.

For instance, under the UN-backed Adaptation Fund, the Planning Institute of Jamaica was accredited as a National Implementing Entity and received funding for water and agriculture resilience programs. This model:

Accelerates access to funding

- Builds institutional capacity
- Ensures better alignment with local priorities

How direct access could apply to maritime decarbonization in this framework:

- National maritime authorities, port agencies, or ministries in SIDS/LDCs could be accredited to access funds directly.
- These entities could use funds for:
    - Upgrading port infrastructure to support ZNZ fuels
    - Training seafarers on low-emission technologies
    - Piloting ZNZ fuel supply chains and bunkering facilities
- The Fund's guidelines would need to provide simplified accreditation processes and capacity support for low-capacity countries.

Accelerate ZNZ Fuel Deployment

- Finalize a robust ZNZ fuel definition based on well-to-wake LCA
- Exclude fuels with high land-use or upstream emissions (e.g., crop-based biofuels)

- Introduce technology-specific multipliers to prioritize wind propulsion, green hydrogen, and other scalable solutions

Further Safeguard Credit Use

Even with some built-in restrictions, the implementation guidelines offer a critical opportunity to strengthen the integrity of the Surplus Unit (SU) system and prevent the mechanism from being used primarily for cost avoidance rather than real decarbonization.

Key safeguards that can be introduced through the guidelines include:

- **Limit the Use of Pooled Credits**

Under the current system, companies can use a pooling arrangement—grouping multiple ships into a single compliance entity. This allows overcompliant ships to generate Surplus Units (SUs) that can be used to offset emissions from underperforming ships in the same pool.

While pooling offers flexibility and is proven important for energy transition at a macrolevel, unrestricted use of pooled credits can undermine the incentive for fleet-wide decarbonization. If all credits from a few "green" vessels are used to cover non-compliant ships, operators may delay upgrades across the rest of the fleet.

Guidelines could address this by capping the portion of SUs that can be used within a pool per ship. For example:

- A vessel might only be allowed to meet up to 50% of its compliance obligation using SUs from other ships in its fleet.
- The remaining SUs would need to be banked, sold outside the pool, or expire after two years.

This would:

- Ensure that each ship still faces pressure to reduce its own emissions.
- Prevent large operators from concentrating compliance in a handful of vessels.
- Support more balanced decarbonization across the global fleet.

Cap SU Usage Per Compliance Year

Regardless of pooling, the total share of a ship's obligation that can be met through SUs should be capped (e.g., 50%). This would reinforce the primacy of direct performance and keep credits as a supplemental, not primary, compliance pathway.

Assign Differentiated Value to Credits

Not all Surplus Units are equal. Credits generated by wind-powered or e-hydrogen vessels could be assigned higher compliance value (or multiplier) than those from marginal efficiency gains or transitional fuels. Guidelines could introduce credit valuation multipliers to reflect environmental integrity and accelerate high-impact technologies.

All of these actions are feasible under the existing legal structure—particularly under Regulations 36 and 38—and would align with the IMO's mandate for environmental effectiveness, transparency, and equity.

Conclusion and Recommendations for IMO Delegations and Policymakers

It is true that the IMO's Net-Zero Framework is a breakthrough and it is true at the same time that it is not a fully credible or equitable path to decarbonization. With the core text approved, to be adopted, the implementation guidelines will determine whether this becomes a regulatory milestone or a missed opportunity.

Equity and Revenue Use

- Define minimum allocations and eligibility criteria for JET funding
- Ensure governance reflects diverse Member State interests, especially vulnerable states
- Remove procedural barriers to Fund access for LDCs and SIDS

ZNZ Fuels and Incentives

- Finalize fuel eligibility based on full life-cycle emissions
- Exclude high-risk fuels and introduce scaling incentives for proven zero-emission options

Credit Use and Compliance Integrity

- Cap annual use of SUs and restrict intra-fleet transfers
- Create differentiated credit valuation to reward high-integrity technologies

What happens between now and MEPC 84 will determine whether the IMO framework sets a new global standard or allows inertia and imbalance to take hold.

References:

- UNFCCC. (2021). Carbon Markets That Put a Price on Carbon Are Crucial for Climate Action. Retrieved from https://unfccc.int/news/carbon-markets-that-put-a-price-on-carbon-are-crucial-for-climate-action.
- Carbon Market Watch. (2022). Letter from the International Coalition for Sustainable Aviation to the ICAO Council on the Adoption of the Emissions Unit Criteria (EUCs) in Order to Address Double-Counting and Increase CORSIA Integrity. Retrieved from https://carbonmarketwatch.org/publications/letter-from-the-international-coalition-for-sustainable-aviation-to-the-icao-council-on-the-adoption-of-the-emissions-unit-criteria-eucs-in-order-to-address-double-counting-and-increase-corsia/.
- Regulation (EU) 2024/2987 available on EUR-Lex: https://eur-lex.europa.eu/eli/reg/2024/2987/oj/eng.
- IMO. (2025). MEPC 83 Summary: Marine Environment Protection Committee. Retrieved from https://www.imo.org/en/MediaCentre/MeetingSummaries/Pages/MEPC-83-Summary-Temporary.aspx
- UCL Energy Institute. (2024). Shipping Research and Decarbonisation Pathways. Retrieved from https://www.ucl.ac.uk/bartlett/energy/research/shipping
- UCL shipping and Oceans Research Group (2025). MEPC83 readout. Retrieved from https://www.shippingandoceans.com/post/phase-out-of-fossil-fuels-in-shipping-begins-in-earnest
- Transport and Environment (2025). T&E's assessment of the impact of the IMO's draft Net-Zero Framework Retrieved from https://www.transportenvironment.org/articles/is-the-imo-on-track
- Transport & Environment. (2024). Carbon Market Revenues Can Fund Green Fuels for Shipping and Aviation. Retrieved from https://www.transportenvironment.org/articles/carbon-market-revenues-can-fund-green-fuels-for-shipping-and-aviation
- DNV. (2023). Maritime Forecast to 2050 – Energy Transition Outlook. Retrieved from https://www.dnv.com/news/dnv-launches-new-report-to-help-shipowners-select-energy-efficiency-measures-and-technologies
- Oxford Institute for Energy Studies. (2024). Fuelling the Future: Techno-Economic Evaluation of E-Ammonia as a Marine Fuel (ET40). Retrieved from https://www.oxfordenergy.org/wpcms/wp-content/uploads/2024/10/ET40-Fuelling-the-future-final.pdf
- International Council on Clean Transportation (ICCT) (2023). Understanding fuel lifecycle costs and abatement potentials for shipping fuels. Retrieved from: https://theicct.org
- Lloyd's List and Ship & Bunker: Regular reporting on VLSFO prices, typically ranging between $500–700 per tonne in recent years, depending on oil market fluctuations. Retrieved from: https://shipandbunker.com
- International Transport Forum. (2022). Carbon Pricing in Shipping. OECD Publishing. Retrieved from: https://www.iaphworldports.org/n-iaph/wp-content/uploads/2024/12/2024-09-26-MTBS-IAPH-Port-Climate-Investments-Report-corrected.pdf

Contact

secretariat@seas-at-risk.org

@SeasAtRisk
Seas At Risk
@seasatrisk_ngo
Seas At Risk

SEAS AT RISK