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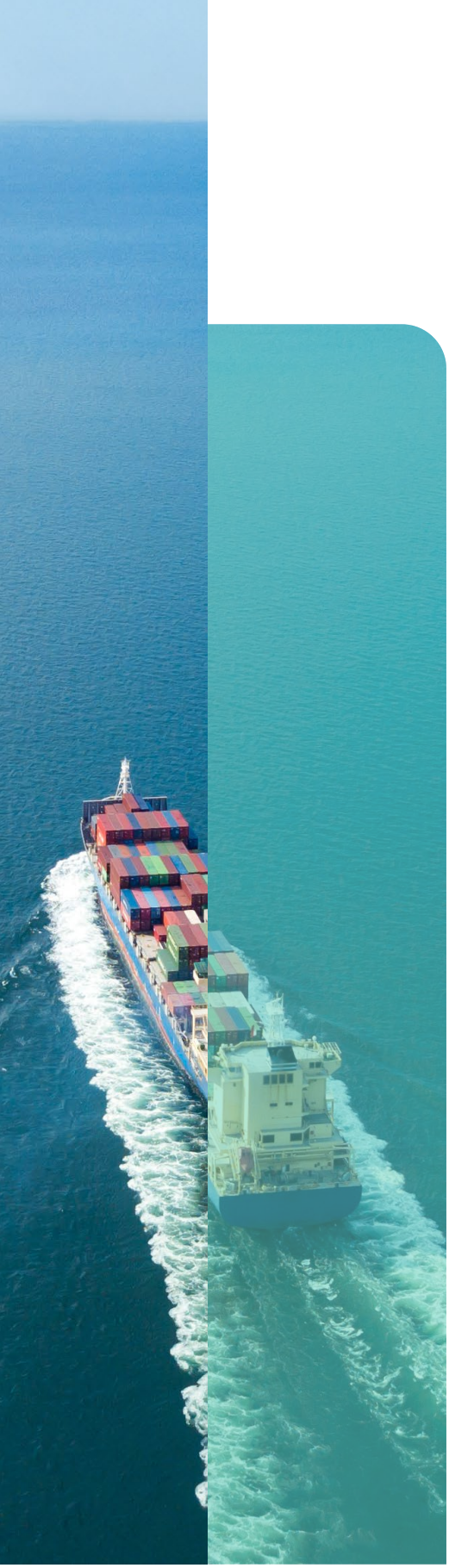
VESSEL PERFORMANCE MANAGEMENT
Emission compliance & operational excellence in shipping

FuelEU Maritime Regulation – August 2025



Summary

FuelEU Maritime Regulation

August 2025

OVERVIEW

FuelEU Maritime is a key pillar of the European Union's Fit for 55 package, aiming to decarbonize maritime transport. It sets mandatory targets to reduce the greenhouse gas (GHG) intensity of energy used onboard ships calling at EU ports. The regulation applies from 1 January 2025, targeting a 2% reduction in GHG intensity, ramping up to 80% by 2050 compared to the 2020 baseline.

Unlike IMO regulations, FuelEU Maritime is a regional regulation, but it has global implications since it applies to any ship >5,000 GT calling at EU ports, regardless of flag.

SCOPE & APPLICABILITY

- Applies to: Commercial vessels >5,000 GT.
- Coverage: 100% of energy used on intra-EU voyages, and 50% of energy used on voyages to/from EU ports.
- Includes: CO_2, CH_4 (methane), and N_2O (nitrous oxide) emissions on a Well-to-Wake basis.

GHG INTENSITY TARGETS

FuelEU Maritime mandates a gradual tightening of GHG intensity of onboard energy use:

- 2025: -2%
- 2030: -6%
- 2040: -31%
- 2050: -80%

These reductions apply relative to the 2020 fleet-wide baseline of 91.16 gCO_2eq/MJ, calculated on a well-to-wake basis.

COMPLIANCE MECHANISM

Each ship must submit an annual verified FuelEU report demonstrating compliance with the GHG intensity limits. The GHG intensity is calculated as:

Total emissions (CO_2eq) / Total energy used (MJ)

If a vessel exceeds the GHG intensity limit, the responsible company must take one or more of the following actions to close the compliance gap:

- **Pay a penalty** (details further down)
- Use **banked surplus** from previous reporting periods, if available. Banking is permitted across multiple years with no expiration, but the surplus must be allocated before the FuelEU Document of Compliance is issued.
- **Borrow** from the following year, up to 2% of that year's GHG limit. Borrowed margin must be repaid in the next cycle with a 10% surcharge. Borrowing is not allowed in consecutive years.
- **Pool** compliance with other ships under a voluntary agreement, allowing over-performing vessels to support under-performers within the same group.

Surplus compliance credits cannot be traded freely between companies but can be shared within a pooling arrangement.

FUEL TYPES & GHG INTENSITY

FuelEU Maritime calculates GHG intensity on a Well-to-Wake basis—combining Well-to-Tank (WtT) and Tank-to-Wake (TtW) emissions for all fuel types, including non-CO_2 gases like CH_4 and N_2O.

Default Emission Factors

- Fossil fuels (e.g., HFO, MGO, VLSFO, LNG, LPG) must use default WtT and TtW emission factors from Annex II; operators cannot deviate for fossil fuels.
- Biofuels, RFNBOs, and Recycled Carbon Fuels can use actual certified emission values if these meet EU-recognized sustainability standards.

Fuel Blends and Weighted Averaging

- When multiple fuels are used onboard, GHG intensity is calculated as a weighted average based on energy content (MJ)
- For bio-blends (e.g., B30, B60), only the biofuel share contributes to the reduction; e.g., a B30 blend contributes 30% of its energy to lowering the ship's average GHG intensity.

FUEL TYPES & GHG INTENSITY

Fossil LNG and Methane Slip

- Fossil gaseous fuels like LNG and LPG are included but their TtW emissions account for methane slip, which must be calculated using default or certified values.

Excluding Non-Energy Sources

- Wind-assisted propulsion and onshore electrical power—if zero-emission—are factored in and effectively reduce the ship's GHG intensity; OPS electricity uses a zero Well-to-Tank factor.

ONSHORE POWER SUPPLY (OPS) & ZERO-EMISSION BERTHING

From 2030, passenger and container ships at EU ports must use onshore power (cold ironing) for stays over 2 hours at TEN-T core ports. Fines apply for non-compliance unless exempted (e.g., emergencies, technical issues).

INCENTIVES FOR RENEWABLE FUELS OF NON-BIOLOGICAL ORIGIN

FuelEU includes a multipliers scheme to encourage uptake of RFNBOs, such as green hydrogen or e-methanol. Ships using RFNBOs may over-comply and generate surplus compliance margin, which can be pooled or banked, similar to GHG Intensity.

How the incentive works

- Until 31 December 2033, RFNBO energy used onboard counts double (multiplier ⊗2) when calculating the ship's GHG intensity.
- Example: If a ship uses 1 MJ of RFNBO, it's counted as 2 MJ of cleaner energy in the GHG formula.
- This multiplier is voluntary, designed to reward early adopters and reduce initial compliance costs while the RFNBO market develops.

RFNBO sub-target

- A 2 % mandatory RFNBO share of onboard energy is triggered from 1 January 2034 — but only if, by 2031, RFNBOs still make up less than 1 % of annual maritime energy use.
- This "sunrise clause" provides flexibility: if uptake is sufficient by 2031, the sub-target may be waived.

INCENTIVES FOR RENEWABLE FUELS OF NON-BIOLOGICAL ORIGIN

Summary Table

Period	Incentive / Requirement
Until 31 Dec 2033	Voluntary ×2 multiplier applies to RFNBO energy
2031 assessment	Check if RFNBO < 1 %; triggers the sub-target if yes
From 1 Jan 2034	Mandatory sub-target of 2 % RFNBO onboard fuel use

CERTIFICATION & REPORTING

- All ships >5,000 GT must submit a verified Monitoring Plan before entering FuelEU compliance — by 31 August 2024, or within two months of their first EU port call after that date.
- From 1 January 2025, ships must track fuel use, energy data, and OPS connection details continuously. Annual reports are due by 31 January of the following year, with compliance verification and issuance of the FuelEU Document of Compliance completed by 30 June.
- All reporting is managed through the dedicated FuelEU database, separate from EU ETS and MRV systems.

PENALTIES, FINES & ENFORCEMENT

GHG Intensity Penalties

- If a vessel exceeds its annual GHG intensity limit, the responsible company must pay a compliance penalty. This is calculated by converting the deficit into tonnes of VLSFO energy-equivalent (41,000 MJ/tonne) and applying a fixed rate of €2,400 per tonne CO_2eq.
- If a vessel remains non-compliant for multiple consecutive years, the penalty increases by 10% per additional year (e.g. 2nd year: €2,640/t; 3rd year: €2,880/t), as defined in Article 23(2) of Regulation (EU) 2023/1805.

PENALTIES, FINES & ENFORCEMENT

Administrative Non-Compliance Fines

- Failure to submit annual FuelEU Reports, to pay penalties on time, or to hold a valid FuelEU Document of Compliance (DoC) triggers administrative penalties, including interest charges and enforcement actions.
- Each EU Member State enforces its own penalty regime under Article 25, aligned with the regulation's minimum standards.

Denial of Entry to EU Ports

A vessel may be denied entry to EU/EEA ports if it:

- Has no valid DoC for two or more consecutive reporting years, or
- Fails to report or pay penalties in two consecutive years.

Such vessels can be subject to expulsion orders and blocked from re-entering EU ports until full compliance is restored.

Enforcement Authorities

Enforcement is carried out by Flag States and Port States, coordinated by the European Maritime Safety Agency (EMSA). The FuelEU database supports monitoring of compliance status, penalty payments, and DoC validity. Authorities may perform retrospective checks on up to two years of data, including voyage records, fuel use, and GHG intensity calculations.

IMPLEMENTATION TIMELINE

Monitoring Plan deadlines

- By 31 August 2024, all ships in scope must have submitted a FuelEU Monitoring Plan to an accredited verifier.
- For ships making their first EU/EEA port call after 31 August 2024, the Monitoring Plan must be submitted within two months of that first call.

Data collection starts on 1 January 2025

- From 1 January 2025 until 31 December 2025, all ships ≥5,000 GT that call at EU/EEA ports must record voyage data, including fuel use, energy sources, and OPS usage.

Reporting & verification timeline

- By 31 January: Submit the annual FuelEU Report for the previous year.
- By 31 March: Verified report and compliance balance logged in the FuelEU database.
- By 30 April: Company records any banking, borrowing, or pooling actions.
- By 30 June: FuelEU Document of Compliance (DoC) is issued if compliant and all penalties are paid.

Verification and compliance enforcement

- Verifiers assess submitted data including OPS use and emissions.
- Authorities may perform retrospective checks on up to two years of data.

COMPLIANCE RESPONSIBLE ENTITY

Under FuelEU Maritime, the responsible entity for compliance is the “company”, this is the ISM company named on the vessel’s Safety Management Certificate (SMC).

This entity is legally responsible for:

- Submitting the FuelEU Monitoring Plan and annual GHG reports,
- Holding a valid FuelEU Document of Compliance (DoC),
- Ensuring accuracy of emissions data and supporting documentation,
- Paying any applicable penalties and maintaining compliance status.

Even if operational control (e.g. fuel choice, speed, routing) lies with a time charterer or cargo interest, the “company” remains the party that authorities will hold accountable. Therefore, commercial agreements such as charter parties should clearly assign responsibility for compliance actions and potential cost recovery for penalties or reporting failures.

The responsible company must also be prepared for verification and retrospective audits, and must maintain full, organized compliance records across all reporting years.

KEY IMPLICATIONS FOR OWNERS & COMMERCIAL SHIP OPERATORS

Fuel procurement accountability

- Must ensure that procured fuels (biofuels, RFNBOs, blends) are certified and meet FuelEU and RED II/III sustainability and traceability requirements.
- Must supply the technical manager or responsible company with all supporting documentation (BDNs, certificates, actual GHG values where applicable).

Impact on emissions profile

- Commercial routing, speed profiles, and cargo schedules directly influence the vessel’s fuel consumption and GHG intensity outcome — affecting compliance status and penalties.
- Choices on OPS usage during port stays fall under operational control and thus influence GHG compliance.

KEY IMPLICATIONS FOR OWNERS & COMMERCIAL SHIP OPERATORS

Risk-sharing for penalties

Since the legal responsibility lies with the company (ISM holder), any commercial decisions that lead to non-compliance must be contractually addressed.

Charter parties and management agreements should include clauses on:

- Responsibility for FuelEU penalties,
- Sharing or transfer of compliance costs (e.g. RU purchases),
- OPS connection obligations.

Pooling participation

Commercial operators managing multiple vessels may initiate or participate in FuelEU pooling arrangements — which requires internal coordination and legal clarity on who controls and benefits from surplus margins.

Monitoring and coordination duty

- Operators must coordinate with the technical manager to provide timely fuel, routing, and voyage data.
- Lack of coordination may result in invalid reporting or verifier rejection.

Reputation and market access

FuelEU compliance influences a vessel's GHG compliance profile, which may affect chartering decisions, green financing, and cargo owner expectations (ESG disclosure, CII alignment).

ROLE OF TECHNICAL MANAGERS / ADVISORS

GHG Compliance Strategy & Modelling

- Develop compliance roadmaps aligned with both FuelEU Maritime and IMO decarbonization frameworks.
- Perform GHG intensity projections across scenarios (speed, routing, fuel type) to optimize regulatory and commercial outcomes.
- Advise on least-cost compliance options including use of RFNBOs, biofuels, and pooling.

Monitoring Plan Development & Maintenance

- Prepare and submit FuelEU Monitoring Plans, and ensure they align with EU verifier expectations.
- Maintain version control and continuous updates to reflect changes in fuel supply, operations, or technology.
- Support verifier engagement and audit readiness.

Fuel Documentation & Certification Control

- Ensure that fuel delivery documentation (e.g., BDNs, sustainability certificates, GHG intensity values) is complete, verifiable, and compliant with RED II/III and FuelEU Annexes.
- Support validation of actual GHG values for alternative fuels (e.g., RFNBOs, biofuels) when claimed.
- Maintain an organized archive of fuel traceability records for verifier inspection and audits.

Data Management & Continuous Validation

- Oversee ongoing data collection from ship systems (e.g., flowmeters, BDNs, OPS logs).
- Conduct internal consistency checks across noon reports, MRV, and FuelEU datasets.
- Ensure completeness and accuracy of data before verifier submission deadlines.
- Credit and Pooling Management
- Manage banking, borrowing, and pooling strategy; track credit balances and compliance forecasts.
- Coordinate pooling agreements across fleet or company groups.
- Optimize use of over-compliance margin to avoid penalties.

ROLE OF TECHNICAL MANAGERS / ADVISORS

- Technology Advisory
- Recommend onboard modifications to improve GHG intensity, such as:
    - Energy-saving devices
    - Hybrid and dual-fuel systems
    - OPS readiness
    - Carbon capture feasibility assessments

Training and Operational Compliance

- Train crew and technical teams on:
    - GHG intensity impact of operational behaviors (e.g., engine loads, OPS use, weather routing).
    - Fuel measurement and emissions monitoring procedures.
- Provide practical checklists and SOPs to support onboard compliance routines.

Regulatory Monitoring & Advisory

- Track evolving FuelEU regulations, verifier guidance, and EU Commission clarifications.

RELATIONSHIP TO EU ETS & IMO NZF

FuelEU Maritime complements the EU ETS, which puts a price on emissions, whereas FuelEU imposes a performance-based standard on fuel quality. Ships may be compliant with one and not the other.

FuelEU's Well-to-Wake GHG approach aligns conceptually with IMO's GHG Fuel Intensity (GFI) metric but is regionally applied and includes a broader scope of enforcement and energy types.

CONCLUSION

FuelEU Maritime is a pivotal regulation driving the decarbonization of maritime shipping into the EU. It brings a performance-based compliance framework, heavily reliant on data accuracy, fuel quality, and proactive emission strategies. With high penalties for non-compliance and long-term targets, operators must treat FuelEU as a core regulatory driver in fleet planning, technical operations, and financial forecasting—alongside IMO's global measures.

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