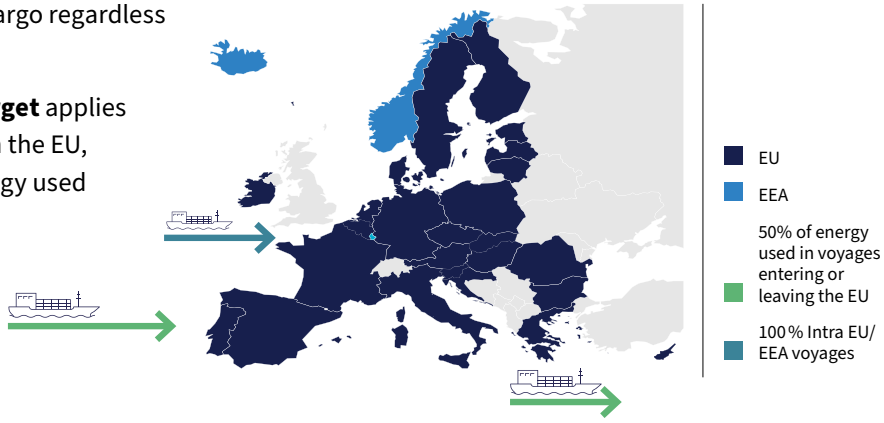
FuelEU Maritime Regulation –

How does it affect the maritime sector?

In 2023, the European Union (EU) adopted the regulation on the use of renewable and low-carbon fuels in maritime transport, also known as the FuelEU Maritime regulation. The regulation intends to promote sustainable commercial maritime shipping in the EU by setting mandatory limits for the greenhouse gas intensity of energy used on board of ships. It also introduces an obligation to use on-shore power supply or zero-emission technology in ports. The regulation will be mandatory in all EU Member States as of 2025.

Who will be affected by the obligations of FuelEU Maritime?

+ **All ships in the EU** with a gross tonnage above 5,000 in commercial passenger transport or cargo regardless of their flag will be affected.
+ **A greenhouse gas (GHG) reduction target** applies to all energy used during voyages within the EU, while it applies to 50 percent of the energy used for voyages entering or leaving the EU.
+ **Exemptions** include small islands (<200,000 residents), public service obligation (PSO) connections between islands and mainland, outermost regions, transshipment ports, and ice-class ships navigating icy waters.



Mandatory specifications in the regulation

1. Limit on GHG emission intensity

The average amount of greenhouse gases produced **per unit of energy used on a ship** in a year must not exceed a certain limit. This limit is calculated by decreasing a reference value of 91.16 grams of CO_2-equivalent per megajoule (MJ) by different percentages over time:

GHG threshold in gCO_2eq/MJ	91.16	89.34	85.69	77.94	62.90	34.64	18.3
GHG reduction		-2%	-6%	-14,5%	-31%	-62%	-80%
Year	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**

Published October 2023

2. Zero-emission requirements for energy used at berth

As of 2030, ships docked for over two hours at TEN-T ports must use on-shore power-supply or zero-emission technologies, such as energy storage or on-board power generation from wind, solar, or fuel cells. Fuel cells for onboard power generation must be powered by hydrogen or ammonia. Whether other fuels, such as e-diesel, will be approved for use in high-temperature fuel cells in the future, is subject to a delegated legal act. By 2035, this applies to all EU ports with on-shore power supply.

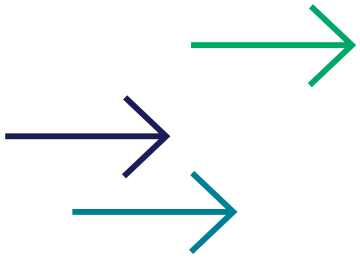
Flexibility mechanisms

+ **Banking and borrowing:** If a ship has reduced its greenhouse gas emissions more than it is obliged to, the company may bank this compliance surplus to the same ship's compliance balance for the following reporting period.
  If a ship does not fulfil the obligation, the company may borrow an advance compliance of up to two percent of the ship's greenhouse gas reduction target from the following reporting period. The deficit multiplied by 1,1 is added to the ship's obligation for the following reporting period. Borrowing is not allowed in two consecutive reporting periods.

+ **Pooling for rewards:** The compliance balance can be combined for multiple ships, including those from different companies. The reduction requirement applies to the overall GHG intensity of the pooled ships. For example, a company may pool the emissions of an old ship running on diesel with those of a new ship running on e-methanol.

Review clause: In 2027 and every five years thereafter, the European Commission must present a report to evaluate the feasibility of the regulation.

How is the GHG reduction achieved?



+ **Methodology:** Life Cycle (Well-to-Wake) evaluation of energy used onboard ships (marine fuels), including carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O) emissions.

+ **Selection of potential marine fuels:**

Electricity-based	Bio-based	Fossil
Hydrogen	Bio-LNG	Very Low Sulphur Fuel Oil (VLSFO)
E-LNG	Bio-diesel	LNG
E-diesel	Hydrotreated vegetable oil (HVO)	Diesel
E-methanol		
E-ammonia		

+ **GHG emission factor:** The regulation prescribes default emission factors for fuels (both well-to-tank and tank-to-wake). As a result, particularly low-emission fuels lead to the highest GHG savings. Furthermore, the energy used at berth (e.g., on-shore power supply) is included in the GHG balance of the ship.

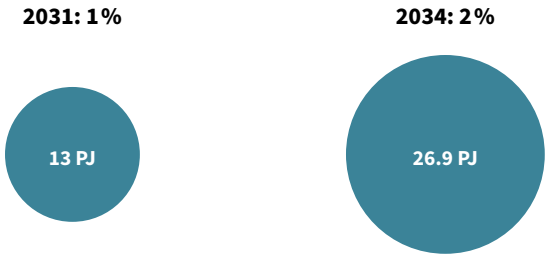
+ **Certification of fuels:** Eligible fuels under the regulation include renewable fuels of non-biological origin (RFNBOs) such as hydrogen and e-fuels, recycled carbon fuels and biofuels as defined in the renewable energy directive (RED), as well as low-carbon gases and other hydrogen-derived fuels as defined in the EU gas market directive that is currently being recast.

Published October 2023

Additional incentives for the use of RFNBOs

+ **Multiplier:** Use of RFNBOs will be double counted towards the GHG reduction of a ship until the end of 2033.
+ **Indicative goal for 2031:** RFNBOs shall be at least one percent of all fuels used by 2031.
+ **Conditional sub-target for 2034:** If the 2031 goal is not met, a two percent target will apply in 2034. The 2034 target may not be enforced in case of issues related to the availability, cost, or distribution of RFNBOs. The European Commission will decide if the sub-target applies.

Estimate for stimulated RFNBO volumes



1.2 GW electrolysis

2.5 GW electrolysis

Side note on RFNBO co-products
E-diesel can be a co-product in the refining process of e-kerosene. The ReFuelEU Aviation regulation sets obligatory quotas for e-kerosene. Assuming a co-product yield for e-diesel of 20–30 percent, an estimated 4–6 PJ of e-diesel could become available from quota fulfilment in the aviation sector.*

* Based on Eurostat Database (2023) and ReFuelEU Aviation quotas in 2030

Source: MRV Database (2022); growth assumption maritime market 1% per annum; electrolysis with 5,000 full load hours and 70% efficiency LHV

How is target fulfillment guaranteed?

+ In case of non-compliance with the targets, the regulation prescribes **penalties for deviations from the GHG compliance balance of ships as well as for non-fulfillment of the RFNBO sub-target**. The compliance shortfall is quantified in terms of energy, based on the ship's real GHG intensity. It incurs a penalty of 2,400 euro per tonne of VLFSO energy equivalent or roughly 60 euro per gigajoule (GJ) of non-compliant energy consumption.
+ Member States shall designate one or more competent **authorities** to be responsible for penalty application and enforcement.

Published October 2023

Imprint NOW GmbH
Fasanenstr. 5
10623 Berlin

Contact Team European Affairs
international.cooperation@now-gmbh.de
& Team Renewable Fuels
erneuerbare.kraftstoffe@now-gmbh.de