



INSIGHT BRIEF | MARCH 2024

What impact will FuelEU Maritime have on voluntary book-and-claim systems?

This insight brief is the first of two that focus on the interaction between voluntary book-and-claim-enabled activities, which are driven by individual corporate willingness to reduce emissions, and compliance activities, which are driven by regulation and binding emissions reduction targets.

It aims to create awareness of how compliance mechanisms impact voluntary book-and-claim-enabled activities, taking the FuelEU Maritime (FEUM) regulation as an example. This paper frames the context for the second insight brief, which will explore the crucial topic of "additionality": determining how voluntary emissions reductions can be considered additional to those undertaken for regulatory compliance.

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Introduction

Studies have suggested that if the shipping industry is to achieve full decarbonisation by 2050, low- and near-zero emission fuels must account for five percent of the sector's fuel usage within this decade. This corresponds to replacing around 16 million metric tonnes of fuel oil with low-emission fuels in 2030.¹

There are associated technology, infrastructure, and market challenges to scaling up to this amount of low- and near-zero emission fuels. Not only is there a need for new vessels and bunkering ecosystems, but there also needs to be a sufficient supply of these fuels at prices the market can bear. The development of this market will require both policy and voluntary action. Emerging policies to accelerate shipping decarbonisation, which are progressively being implemented by the International Maritime Organisation (IMO) and local and regional regulators, can be complemented by voluntary actions from companies willing to share the extra costs of decarbonisation by paying a premium for low-emission transportation solutions.

FuelEU Maritime GHG provisions and scope

Taking effect in 2025, the FEUM legislation is part of the EU's 'Fit for 55' package. It aims to stimulate the demand for, and consistent uptake of, renewable fuels to reduce greenhouse gas (GHG) emissions from the shipping sector while ensuring the smooth operation of maritime traffic and avoiding distortions in the internal market.²

The regulation applies to all ships and voyages subject to the EU MRV (Monitoring, Reporting, and Verification) maritime regulation. Geographically, this corresponds to 100% of intra-European Economic Area (EEA) voyages and 50% of extra-EEA voyages.

By requiring vessels to decrease the average GHG intensity of their fuel use by 2% relative starting in 2025 and gradually reaching an 80% decrease by 2050, FEUM makes switching to cleaner fuels the most direct means for a company to meet emissions reduction requirements and avoid penalties.

Mechanisms to overcome the cost gap in the uptake of low- and near-zero emission fuels

This switch, however, could be slowed down by logistical challenges in matching the supply of low- and near-zero emission fuels with demand, something already seen in today's constrained markets for biofuel. One way the shipping industry has been addressing this is by implementing book-and-claim systems. These allow the separation of the emission profile of a zero-emission fuel or transportation service from the physical flow of that fuel in a transportation supply chain. In turn, cargo owners can access low, or possibly zero-emission services without being bound by physical fuel availability. Given their flexibility, book-and-claim systems could play a major role in accelerating the early phases of shipping's decarbonisation transition.

While the IMO has not yet set a global fuel standard and/or economic measures, several regulations for shipping decarbonisation have emerged on the national and regional levels. For example, since

¹ D. Baresic, et.al. (2023). Getting to Zero Coalition. [Climate action in shipping: Progress towards shipping's 2030 breakthrough.](#)

² Council of the EU (2023). [FuelEU maritime initiative: Council adopts new law to decarbonise the maritime sector.](#)

January 2024, maritime emissions have been included in the EU Emissions Trading System (ETS), an EU-level carbon market based on a 'cap-and-trade' system to reduce emissions, in which polluters pay for their GHG emissions. Like FEUM, this enhancement of the EU ETS is part of the EU's 'Fit for 55' package.

How will FEUM impact voluntary insetting markets?

Regulatory frameworks require accounting and verification activities that may overlap with those used in voluntary book-and-claim systems. They are also likely to generate new market activity that has the potential to reshape voluntary markets.

The entry into force of compliance regimes, first FEUM and eventually the IMO's mid-term measures expected to come into effect in 2027, will have an impact on stakeholders partaking in the voluntary markets and the book-and-claim systems that enable them. This begs the question whether voluntary actions are "additional" to actions taken for compliance. There is no singular, prevailing definition of additionality in the maritime context. Various definitions employed by crucial bodies like the GHG Protocol and the Smart Freight Centre (SFC) contribute to the complexity of the subject. In the context of transportation, the SFC defines additionality as "a criterion for assessing whether a solution or a Low Emissions Transportation Service are required by regulation."

The following analysis assumes that additionality will be a consideration in some fashion when FEUM comes into effect. An overview of FEUM's compliance strategies is provided below.

FEUM compliance strategies

FEUM offers operators various compliance strategies to adhere to the regulation:

(i) Banking

If a ship has a compliance surplus in a given year, it can carry forward that over-compliance to the subsequent year, provided it receives approval from its verifier. This process is known as "banking". However, the regulation does not specify how long banked compliance can/should accumulate.

(ii) Borrowing

Conversely, "borrowing" is a mechanism that allows ships that under-comply in a given reporting year to borrow from the ship's compliance balance in a future reporting year. There are, however, limitations to borrowing:

- Borrowing is limited to 2% of the compliance surplus and compliance cannot be borrowed for more than two consecutive reporting years.
- The borrowed compliance is multiplied by 1.1, as an interest, before being subtracted from the ship's compliance balance in the following reporting year.

(iii) Pooling

To meet FEUM requirements, ships are allowed to pool their compliance balances for meeting GHG intensity targets so that a few over-performing vessels can offset the deficits of other vessels in the pooled fleet. Ships from different companies are allowed to form a pool.

When pooling is used, the following information must be registered in the FEUM database: the compliance balance for each ship, the allocation of the total pool compliance balance to each individual ship, and the verifiers assessing that allocation.

To minimise inconsistencies and distortions, the legislation includes some provisions for pooling. A ship's compliance balance can only be included in one pool per reporting period, but a sub-pool may be introduced from 2034 to further incentivise the use of renewable fuels of non-biological origin (RFNBO). Furthermore, the GHG intensity of all ships in a pool should collectively meet the GHG intensity limit of the year, i.e. the pool cannot have a compliance deficit.

It is worth noting that a ship that has borrowed compliance cannot be included in a pool in the same reporting year. Simultaneously, when a vessel with over-compliance changes a pool, its banked compliance surplus also moves with it.

(iv) Penalties

Alternatively, operators can opt to pay penalties to cover compliance deficits for GHG emissions to the tune of €2,400 per equivalent metric ton of VLSFO.³

If a ship has a compliance deficit for two consecutive reporting periods or more, that amount shall be multiplied by $1 + (n - 1)/10$, where n is the number of consecutive reporting periods for which the operator is subject to a FEUM penalty for that ship.

(v) Enforcement

Vessels are required to hold a valid FEUM document of compliance, which is monitored at EEA ports. Non-compliance is penalised and penalties escalate when repeated (as in the case of borrowing). Penalties can only be reduced through the adoption of alternative fuels.

Implications of FEUM on the voluntary market for shipping emissions reductions

At a high level, FEUM has two sets of implications for voluntary markets: implications for supply and demand, and implications for tracking information and system design.

³ European Union (2023). [REGULATION \(EU\) 2023/1805 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 13 September 2023 on the use of renewable and low-carbon fuels in maritime transport, and amending Directive 2009/16/EC.](#)

Implications for supply and demand of emissions reductions in the voluntary market

FEUM creates a new “business as usual” regime, and under this, complying with emissions reduction requirements will – in the short term – create some new compliance costs for companies while stimulating demand for the use of low- and near-zero emission vessels and fuels.

The zero-emission vessels and fuels available on the market will be, in part, utilised compliance, as demand for zero-emission fuels will increase over time on the compliance market. Current and near-term FEUM requirements are still quite weak; a recent study found that one ship running on green methanol can offset the emissions of ten conventionally-fuelled ships in the same pool every year between 2030-2034 to meet the targets.⁴ The oversupply that zero-emissions ships will generate could either be banked for future compliance, pooled with other ships for immediate compliance, or made available on the voluntary market.

If it is assumed that voluntary markets will require emissions reductions to be “additional” to compliance, this should create a situation where companies will have to compare the value of banked or pooled low- and near-zero emission fuels, interventions, and/or emissions reductions to their values on the voluntary market.

In a perfect market, this competition would stimulate a greater supply of zero-emission vessels and fuels. The industry is only partially on track towards meeting 2030 fuel targets,⁵ which leaves reason to believe that the supply of both might be constrained in the early years of shipping’s transition. Whether or not compliance with FEUM will hurt the supply of zero-emission shipping services on the voluntary market remains to be seen, but there may potentially be a geographical distortion, with voluntary transactions focusing on journeys that take place wholly outside of Europe.

Implications for data accessibility to verify additionality

FEUM’s entry into force could potentially bring about new opportunities as well as complexities for the voluntary markets. Specifically, it highlights the importance of ensuring that these markets, along with their registries and accounting systems, have the capability to access and provide the necessary information.

FEUM will develop its own verification procedure and database to track and manage compliance. Meanwhile, companies are also individually developing technological solutions (including maritime book-and-claim registries) and extending the capabilities of their systems to track and manage transactions related to the regulation.

While norms about what makes voluntary emissions reductions “additional” to compliance still need to be developed, it is clear that the design and operation of book-and-claim systems and registries will have to accommodate some information about compliance. For any “booked” emissions reduction activity, information to attest that the reduction has not been used in a compliance regime, and potentially some third-party verification of said information, will be needed.

Given that compliance will be traded via pools and banked for future use, book-and-claim systems may need to be able to access data about these compliance strategies, potentially updating the information over time. There is expected to be a time lag between the implementation of these strategies and the formal accounting in the EU system. Therefore, registries will need to be able to identify whether reductions have been included in a compliance pool, potentially even before

4 Lloyd’s Register (2024). [Shipping and fit for 55: Managing compliance and optimising operations under the EU’s new regime](#).

5 D. Baresic, et.al. (2023). Getting to Zero Coalition. [Climate action in shipping: Progress towards shipping’s 2030 breakthrough](#).

these pools are reported to the EU. This delay has been estimated at up to 16 months, given that FEUM compliance is reported annually.⁶ Meanwhile, voluntary book-and-claim systems may enable swifter transactions and the resulting different timelines could pose challenges and create reporting inconsistencies.

Monitoring surplus compliance will be challenging. There are no limits on how long companies can bank compliance surplus, as well as uncertainties regarding the cumulative storage of the compliance surplus(es). Questions about how these will be audited, and how to potentially reset compliance at the beginning or end of a reporting year remain to be answered. Independent verifiers will have access to the FEUM database on the vessels they verify, but credit buyers' access to the information shared within voluntary book-and-claim-enabled markets will depend on the registries and protocols used.

Not only will voluntary book-and-claim systems need to ensure verifiers can access information, but the information will also need to be transferrable across multiple competing systems on the voluntary market. It will be especially important to ensure that the technological solutions developed to manage the inventory of achieved, banked, borrowed, and pooled compliance with FEUM, are integrated and interoperable with book-and-claim registries used in the voluntary markets. These systems should also be sufficiently flexible to adapt to future regulatory developments without the need to constantly create new ones. Information sharing and system interoperability may become even more urgent once information about compliance gets tracked and shared.

More simply, but just as crucially, compliance markets and voluntary markets will need to use the same emission factors in their calculations to ensure compatibility. This will not only ease administrative burdens but will also provide consistency and credibility and potentially even encourage convergence between different voluntary schemes.

Conclusions

The existing book-and-claim-enabled offerings have processes that differ from each other, such as different methods of emissions calculation or verification processes, and there may be potential inconsistencies between FEUM and the technical implementation of emerging approaches. Emerging book-and-claim systems should seek to design systems that align with the standards that will be set by FEUM and other international regulations, as this will be key in streamlining processes and bridging any potential inconsistencies.

Still, the biggest hurdle in incorporating information about additionality in book-and-claim systems persists due to the lack of a widely accepted interpretation of additionality in the shipping decarbonisation context. Converging on a common definition and standardised additionality criteria will be crucial to making book-and-claim systems workable and credible in an era of emerging regulation. In the meantime, the sector can begin to work on the development of robust and interoperable monitoring and verification systems that enable data-sharing and transparency between compliance and voluntary markets.

⁶ This means that a reduction performed in January of a given year will only be determined additional (or not) in the following year. This may thus impact supply on the voluntary market, as the reductions achieved would only enter the voluntary market and be guaranteed as additional in June of the following year when they can be booked. Book-and-claim systems will need to consider this time lag when determining rules on vintage requirements.