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BIOFUELS

BREAKTHROUGH?

TRACTION IN THE MARINE MARKET

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A breakthrough for biofuels?

Paola Rodriguez-Masiu and Thomas Hoogsteden of STX Group look at how biofuels are gaining traction in the marine market

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For decades, the shipping industry has been powered by high sulphur fuel oil (HSFO) made from the dregs of the refining process. 'Dirty and unwanted' was how market participants summarised the prospects for HSFO after IMO 2020, with many analysts rushing to write fuel oil's obituary and countless pages about marine gasoil's (MGO) and other fuels bright future. Today, soon to be three years on from IMO 2020, this outlook has refused to materialise. The bottom-of-the-barrel fuel is still used to propel the shipping business, while the uptake of alternative fuels such as MGO and LNG has barely grown. Today's enthusiastic use of HSFO seems contradictory in the context of energy transition and tougher environmental regulations. But it is consistent with the dynamics of the shipping industry, which is a volumes game, sensitive to price and fuel economics.

On the eve of upcoming tougher environmental restrictions for the maritime sector, analysts and market participants are reunite-

ing to announce, once again, the 'death of fuel oil'. The shining new winner this time? Biofuels. Biofuels and their use in the marine sector are not new, but they have recently gained a lot of traction and went from just another talked-about-alternative to 'the solution'. In the form of oils, methane or methanol, biofuels are deemed as the only sustainable and economically viable option in the short-term. In this article, we concentrate on 'bio-fuel oils', as conventional vessels still dominate

the global fleet, and they can be used as drop-in fuels in these vessels or mixed with similar fossil versions. With the global fleet of alternative fuels ships growing, we will see other contenders such as Bio-LNG rising.

One could argue that when it comes to environmental transition, the shipping industry has a history of doing the bare minimum and, if possible, even less. As such, it is fair to ask: will new policies and regulations once and for all brand the incumbent fuels as

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‘unwanted’? Plus, can biofuels really emerge as the clear winner in the marine fuels debate?

In the following lines, we will answer these questions, while we analyse the upcoming policies and how they could make it increasingly uneconomical to burn fossil fuels. For those eager to skip to the end, the message is that from all the regulations lined-up, FuelEU Maritime will have the highest cost impact and provide strong tailwinds for biofuels, as it sets strict fuel reduction targets, in combination with heavy fines for non-compliant vessels. As flexibility is king in the era of uncertainty, the International Maritime Organization’s Carbon Intensity Indicator (CII) is likely to support biofuels consumption as it allows compliance without committing to new technology that might become stranded or disadvantageous. In contrast, the Europe Union’s Emission Trading System (EU ETS) Maritime is expected to have a limited cost impact and it won’t incentivise biofuels intake as it will still be cheaper to pay the de facto ‘carbon tax’ and burn the same-old fuel. In conclu-

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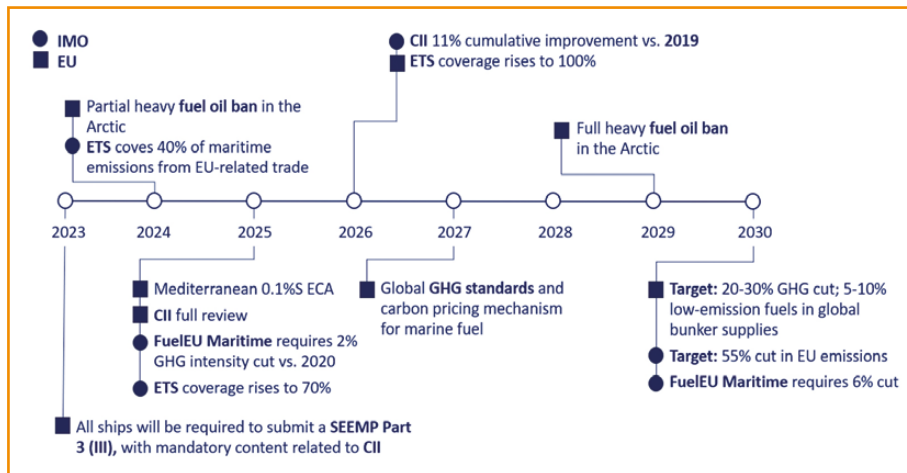


Image 1: Marine fuels evolve for net-zero. Source: STX Research and Trade Analytics

sion. No, don’t write the incumbent fossil fuels obituary (just yet), and yes, biofuels might be the winner of new policies (in the short-term).

IMO CARBON INTENSITY INDICATOR

Commencing in 2023, IMO CII establishes a downward trajectory measurement of a (>5,000 GT) ship’s carbon intensity, which is the amount of carbon emissions generated by a unit of transport work, equivalent to one nominal tonne of cargo carried over a nautical mile. The CII assigns an ‘energy efficiency’ rating to all ships (from A to E), based on the calculated carbon intensity.

This is particularly crucial in the context of market uncertainties regarding future alternative fuels that make it challenging for shipowners to make CAPEX decisions on which type vessels to order to replace their aging ones. This incentivises drop-in fuels that can reduce the rating of vessels, without deciding (just yet) what type of vessel to order. An ABS analysis concluded that a vessel propelled by heavy fuel oil could see

its rating improved from D to A in 2023 with the addition of a 30% blend of biodiesel.

Despite their indisputable potential, the use of biofuels in shipping today is still a rather expensive option vs. certain energy efficiency measures. However, as charterers are getting pickier on the CII ratings for their voyages, we foresee a pickup in ‘voluntary’ biofuel purchases to improve CII trajectories.

EU ETS MARITIME

Starting in 2024, the system will cover the CO₂ emissions from cargo and passenger vessels (>5,000 GT) entering EU ports. From 2027, large offshore service ships (above 5,000 GT), will be included.

The system covers only tank-to-wake (TtW) emissions, thus:

- 100% of TtW emissions between two EU ports.
- 100% of TtW emissions at berth in EU ports.
- 50% of TtW emissions between EU and non-EU ports, whether incoming or outgoing.

The phase-in period will work as follows: In 2024, only 40% of the verified emissions must be covered by EUAs, increasing to 70% in 2025 and 100% in 2026.

In essence, the EU ETS is an emission tax, where for each taxable tonne of CO₂ emitted, one EU Allowance (EUA) must be purchased. Under ETS, sustainable renewable fuels will have a zero TtW emission factor, with the price of EUAs determining the incentive to blend biofuels (or not). If the EUA price translates into a higher figure than a biofuels premium over very low sulphur fuel oil (VLSFO), shippers will look at blending. If not, they will surrender an EUA. At current EUA prices, the choice seems pretty clear, since reducing 1 tonne of CO₂ using biofuels is significantly higher (+€277/tonne) than buying an EUA.

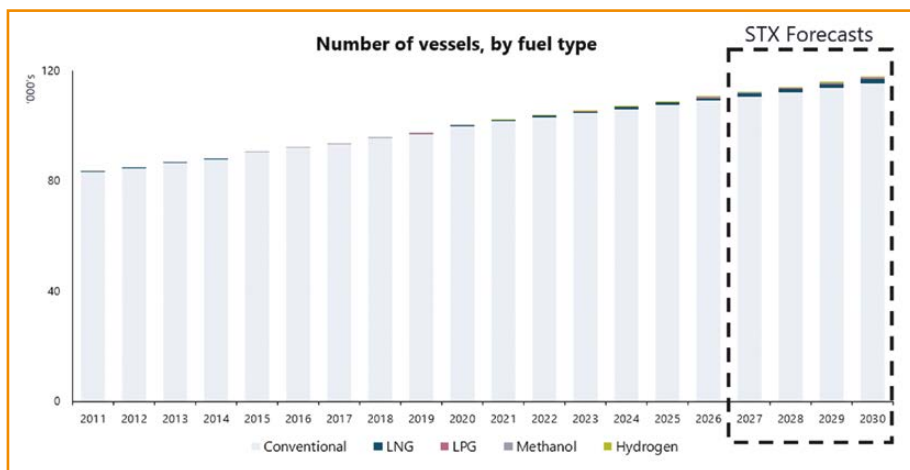


Image 2: Vessels in operation and on order. Fleet size 100 gross tons and above. Source: DNV; STX forecasts from 2027 onward.

- One EUA costs €80.
- One tonne of advanced biofuel carries a premium of €1,000 compared to VLSFO.
- One tonne of advanced FAME, compared to one tonne of VLSFO, reduces 2.8 tonnes of CO₂ (tank-to-wake) under EU ETS.

There are a few levers that could be pulled

will be popping up after the introduction of FuelEU Maritime. These national schemes, like the HBE in the Netherlands, can reduce the delta between the EUA and the biofuel price.

In conclusion, the EU ETS on its own will not be the big breakthrough for biofuels, but extra help from market conditions or policies like FuelEU Maritime might.

Expect more environmentally conscious countries, such as The Netherlands, to make an effort to bring down the delta between biofuel and EUA prices by increasing the GHG % cut.

Obligations under FuelEU will make the payments towards EU ETS less, but the overall payments not less painful, as the cost of biofuel compared to EU ETS is high. Yet, we expect the level of non-compliance to be minimal as it comes with a penalty of €2,400 a tonne of VLSFO equivalent.

1t Bio premium €1000
 1t Bio abates 2.8 CO₂

= 357 /1t CO₂ reduced w. Biofuel

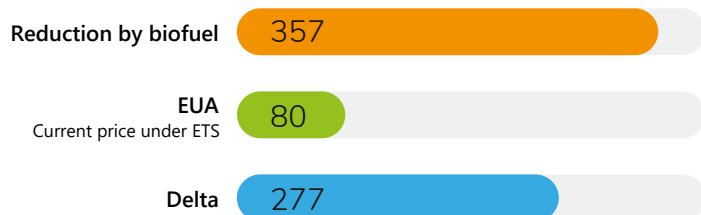


Image 3: Current carbon pricing, blending biofuels is not competitive

CONCLUSION

We are witnessing increased interest from proactive and entrepreneurial bunker companies, offering additional levels of service to clients as uncertainty grows with the new policies. Packaging or bundling bunker supplies with the necessary EUAs is growing in popularity. While it is unquestionable that biofuels are set to experience double-digit growth, it is important to explore all available options and not follow the herd focusing solely on one alternative. Notably, as regulations in other sectors such as road transport and aviation will also lead to higher demand for biodiesel feedstocks.

For a sector accustomed to burning low-cost fuels, it might be hard to compete with other 'premium' sectors for the same fuels. It is wise to get ready for the storm. Even as the most stringent regulations are kick-starting only in 2025, companies should start testing batches of biofuels in 2024 to gain insights about the products their fleet can handle. The message is to start preparing supply chains, and educating clients as we are about to witness what the IMO 2020 sulphur cap regulation could not deliver: a complete transformation of the sector's landscape.

to make the biofuel option more attractive. The first lever is obvious: an increase in EUA prices. EUA prices will remain mostly driven by the power and industry sector, entailing shipping to be a price taker for the allowances. Anticipating a mild winter, demand for EUAs in the power sector is likely to remain subdued, potentially keeping prices stable or even on a bearish trend for the upcoming winter. Conversely, geopolitical uncertainties and fluctuations in gas prices pose an upward risk. This scenario would reduce the delta but likely not enough to make biofuel preferable over EUAs. The second, is a decline in biofuel prices, but we do not foresee biofuel prices declining enough to change the incentive either. Finally, the third lever is closely aligned with FuelEU Maritime. Many national schemes

FUELEU MARITIME

From 2025 onwards, 100% of the intra-EU voyages and 50% of the extra-EU voyages will be obligated to reduce GHG intensity of fuels. Unlike EU ETS, the FuelEU regulation considers the well-to-wake (WtW) emissions, which include the entire process of fuel production. Because alternative fuels are still in their infancy, most of the savings needed under FuelEU will be generated by FAME/HVO blending. We anticipate that the policy will lead to a minimum of 791kt of biofuel needed in 2025, growing steadily each year. To put this into perspective, in 2022, the marine biofuel market in the Netherlands totalled about 400kt.

It is important to highlight that the 2% cut provided by the EU represents the mini-

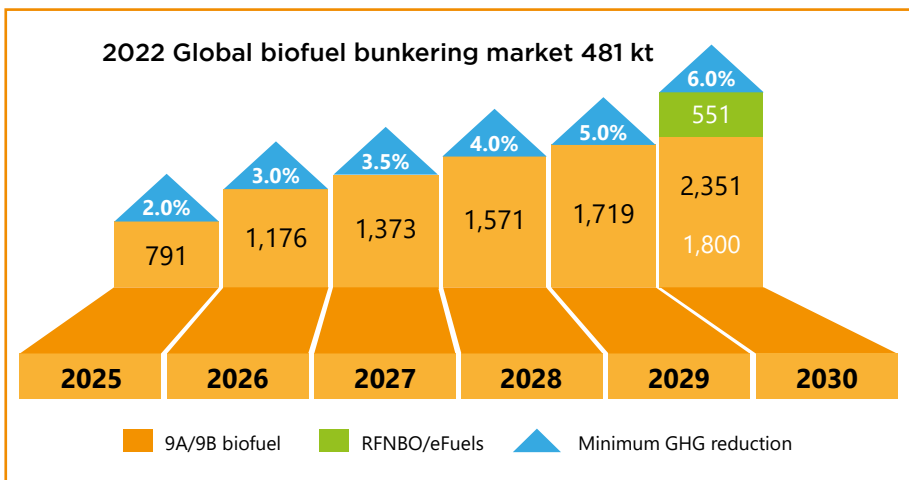


Image 4: Marine sector biofuel demand (kt)
 Source: CE Delft fleet model, DNV Maritime Forecast 2022 – 2050 based forecast

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