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BIOFUELS BREAKTHROUGH?

TRACTION IN THE MARINE MARKET

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Great expectations?

Hussein Al-Khalisy of *Argus Media* asks if B24 biofuel blends could be shipping's lane to lower emissions

Demand in the Mediterranean for marine biodiesel blends is rising in anticipation of the inclusion of shipping in the EU emissions trading system (ETS) from 2024 as well as emissions targets under the FuelEU maritime initiative starting in 2025.

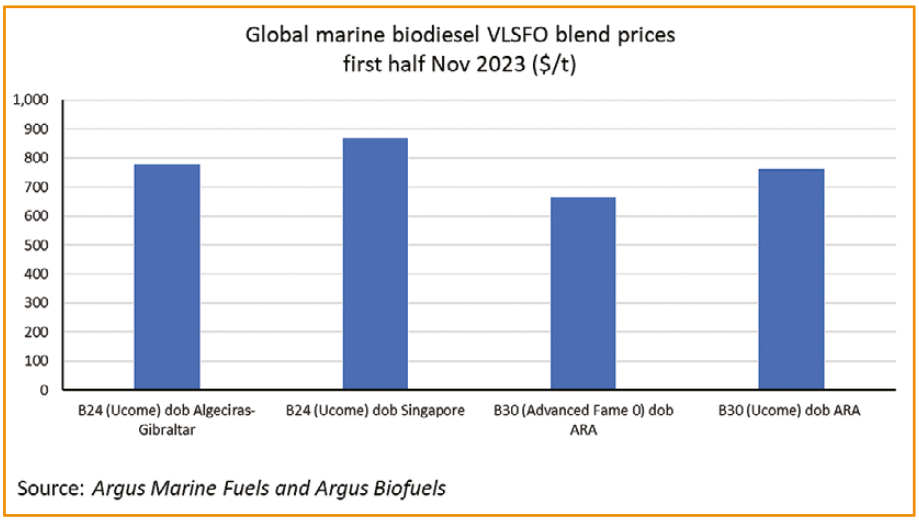
Further, IMO's Carbon Intensity Indicator (CII) as a measure of vessel energy efficiency kicked off this year, with levels reported in 2023 for each vessel assigned grades in 2024. Vessels with a low rating are then subjected to a correction plan and non-compliance may result in financial penalties.

An increasing number of suppliers are offering marine biodiesel blends for bunkering in the west Mediterranean in response to rising demand from local and global shipowners.

With traded volumes of marine biodiesel increasing steadily and those bunkering it seeking pricing transparency, Argus launched a B24 delivered on board (dob) Algeciras-Gibraltar spot price assessment in November. The B24 price comprises a blend of 24% used cooking oil methyl ester (UCOME) and 76% very low sulphur, 0.05% fuel oil (VLSFO).

B24 dob Algeciras-Gibraltar was assessed at an average of $783 per tonne in the first two weeks of November, or an average premium of $173 per tonne to conventional VLSFO in the west Mediterranean bunkering hub of Gibraltar-Algeciras-Ceuta (GAC).

Market expectations point to growing marine biodiesel demand in the Mediterranean over the next two years on the back of new regulations. We can look at growth in northwest Europe as a proxy, with biofuel-blended bunker sales from Rotterdam rising almost 200% to 518,000 tonnes in the first nine months of 2023 com-



Source: *Argus Marine Fuels and Argus Biofuels*

pared with the same time period in 2021, according to data from the Port of Rotterdam.

MARINE BIODIESEL: HOW ARE GLOBAL PRICES FARING?

B24 dob Algeciras-Gibraltar held a 10% ($88/t) discount to B24 dob Singapore on average during the first half of November. But it held a slight premium of 3% ($23/t) to the Argus B30 (Ucome) free on board (fob) Amsterdam-Rotterdam-Antwerp (ARA), which combines the European benchmark biodiesel assessment and fob VLSFO barge prices.

The premium to NW Europe can be partially attributed to slight differences such as a delivered premium against fob prices. Moreover, the biodiesel component of the B30 (UCOME) fob ARA price has a 0°C cold filter plugging point (CFPP), with the benchmark long established for pricing biodiesel for the road fuels market. The value of the low CFPP increases in winter, with road fuel blenders seeking biodiesel with better cold weather specifications.

B24 dob Algeciras-Gibraltar was marked at an 18% ($121/t) premium to the Argus B30 advanced fatty acid methyl ester (FAME) 0°C CFPP dob ARA price, which combines biodiesel produced from Annex IX Part A of the EU's Renewable Energy Directive (RED) and VLSFO dob ARA prices.

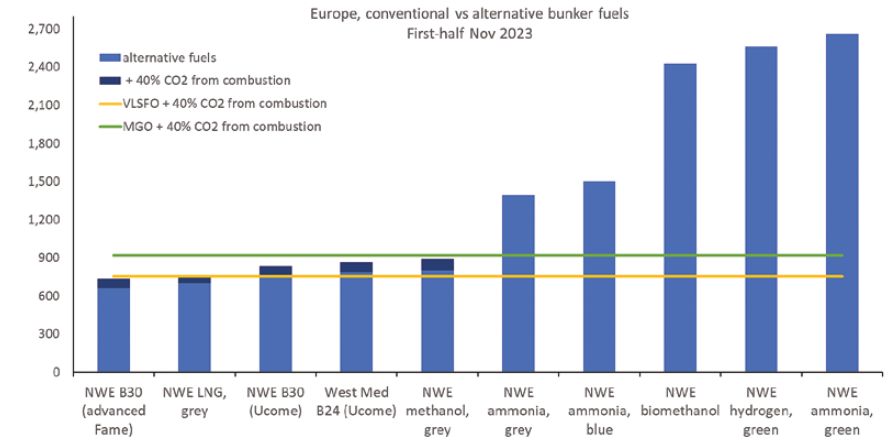
But beyond having the same CFPP value as B30 (UCOME) fob ARA, this price incorporates a significant price deduction for advanced Dutch renewable fuel (HBE-G) tickets which are available for those blending Annex IX A biofuels into marine fuels in the Netherlands.

Advanced biofuels supplied to seagoing vessels can be double-counted against domestic renewables targets, currently resulting in a 1.6 multiplier for the advanced biofuels component in a marine biodiesel blend. This has supported marine biodiesel for bunkering liquidity in Dutch ports such as Rotterdam and Amsterdam.

WHY B24 IN THE MEDITERRANEAN AND NOT B30?

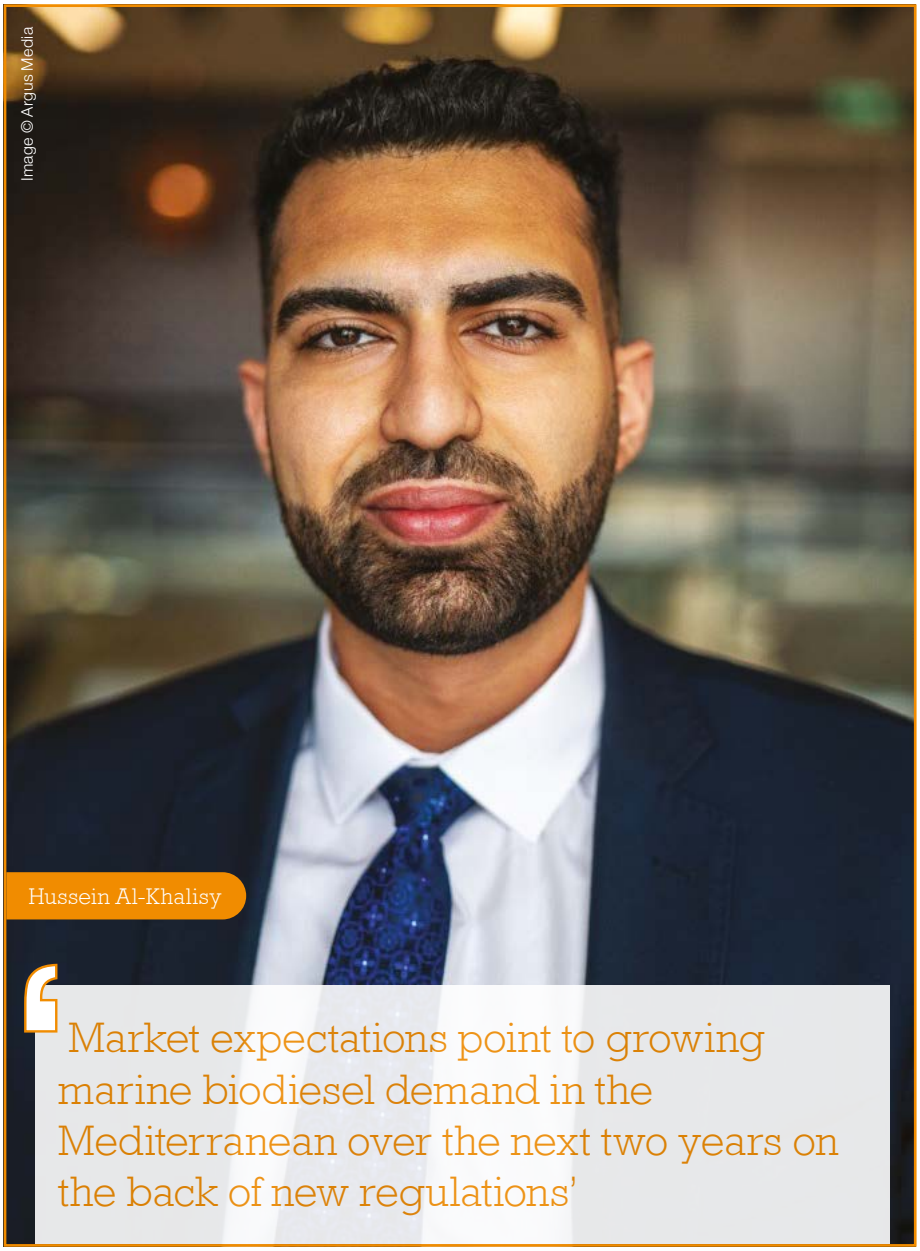
Supply and demand has concentrated around B24, a 24% blend of biodiesel, because of international regulations, namely the International Maritime Organization (IMO) guidelines (MSC-MEPC.2Circ.17) for carrying bulk blends of biofuels and conventional bunker fuels.

When the conventional fossil component of the blend is equal to or higher than 75%, it is subject to MARPOL Annex I oil tanker regulations. But if the biofuel-component of the



Source: *Argus Marine Fuels*

B24 dob Algeciras-Gibraltar is 22% more expensive than conventional VLSFO dob GAC on an outright $/t basis. It is significantly cheaper than other low-carbon fuels shown here in VLSFO energy equivalents – such as biomethanol – for which prices in Europe are currently driven by those blending the product into gasoline – by 209% (see chart). It is also cheaper than blue ammonia, by 95% and green ammonia by 240% during the same period.



> 'Limiting the marine biodiesel blend to 24% for ''seagoing'' barges in the Mediterranean means that supplies can be delivered to vessels by oil tankers as well as more specialised chemical tankers'

blend exceeds 25%, it is subject to MARPOL Annex II chemical tanker regulations.

Limiting the marine biodiesel blend to 24% for 'seagoing' barges in the Mediterranean means that supplies can be delivered to vessels by oil tankers as well as more specialised chemical tankers. This reduces exposure to higher costs that may be associated with chemical tankers and reduces logistical complications because of barge shortages or delays. Companies blend to 24% to ensure that blends remain under the 25% threshold. This does not apply to the ARA region as supply vessels there are considered "river-going" barges.

UPCOMING REGULATIONS DRIVING DEMAND

The EU ETS for shipping will be implemented next year whereby cargo and passenger ships of 5,000 or more gross tonnes will pay for 40% of their verified emissions in 2024, 70% in 2025 and then 100% from 2026 onwards. This will cover CO_2 emissions initially, before expanding to cover methane and nitrous oxide emissions from 2026. Combustion of the biofuel component in a marine biodiesel blend will have an emission factor of zero under the EU ETS scheme.

Further, the European Council adopted into law the FuelEU Maritime regulation in July this year. The initiative aims to reduce the greenhouse gas (GHG) intensity of fuels by 2% in 2025 and up to 80% by 2050, as part of the EU's 'Fit for 55' package.

The regulation will also provide an incentive for the uptake of renewable fuels of non-biological origin (RFNBO) with high decarbonisation potential and while this does not apply to marine biodiesel blends, they remain readily available and relatively price competitive – meaning they will play a significant role in the GHG reduction targets outlined in the initiative.

CII regulations were implemented in line with MARPOL Annex VI, requiring shipowners to document the annual CII score of each vessel in its fleet. Vessels will be assigned a grade from A to E in 2024 for the operation in calendar year 2023 representing its energy efficiency.

Those rated A, B or C are considered energy efficient but the rating thresholds will get increasingly stringent out to 2030. Vessels with E rating will be subject to an approved correction plan that must be implemented within two years of earning the rating. Vessels graded D for three years in a row will also be subject to a corrective plan.

Bunkering marine biodiesel can enhance a vessel's CII rating by reducing the CO_2 emissions associated with fuel consumption and allow non-compliant boats to avoid financial fines and increased refinancing costs. Using marine biodiesel blends can help shipowners score higher CII grades and help postpone the scrapping of older, less efficient vessels.

> 'The marine sector may benefit from greater flexibility than road in that engines are compatible with lesser quality or off-spec UCOME that are not suitable for car and truck use'

NAVIGATING FEEDSTOCK AVAILABILITY CHALLENGES

Used cooking oil (UCO) is the bio-feedstock for UCOME which is emerging as the dominant biodiesel for marine blending at key global ports. RED Annex IX lists several waste and residue feedstocks but UCO is the most established to date. It is likely to remain the dominant option for decarbonising the maritime sector when EU ETS and FuelEU starts to bite in the next two years.

The shipping sector could face shortages of UCOME as demand for UCO continues to grow from the aviation sector in the second half of the decade. Expectations are that the bulk of UCO in Europe will be allocated towards hydroprocessed esters and fatty acids (HEFA) synthetic paraffinic kerosene (SPK) for sustainable aviation fuel (SAF) production.

The aviation sector is expected to outcompete marine price expectations several times over. As an example, the HEFA SPK fob ARA range spot price averaged at $3,041/t in the first half of November, 288% higher than B24 dob Algeciras-Gibraltar during the same time.

SAF prices will face upward pressure from 1 January 2025, when the EU aviation sector is set to use a minimum share of 2% SAF in its fuel mix each year, with targets rising to 6% in 2030 and more steeply thereafter every five years.

Still, as things stand, the marine sector has so far shown a preference for UCOME as the waste-based bio-component for marine biodiesel blends.

The marine sector may benefit from greater flexibility than road in that engines are compatible with lesser quality or off-spec UCOME that are not suitable for car and truck use.

Further, some shipping companies are looking into the potential of other waste-based feedstocks like palm oil mill effluent methyl ester (POME OME) and pyrolysis oil from biomass.

In some regions, shipowners are turning to biodiesel produced from virgin vegetable oils but many companies, particularly in northwest Europe are focussed on waste-based biodiesels accompanied by proof of sustainability.

The maritime industry is revving up its direction of travel towards decarbonisation, and marine biodiesel is expected to take the wheel to meet near-term GHG emission targets until other alternatives like low carbon methanol and ammonia are at scale. Still, the voyage may face challenges in light of other sectors utilising biofuels to meet their own decarbonisation goals and shipping will have to find lanes to adapt to these barriers.

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