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## Marine biodiesel uptake gains momentum, yet long term market outlook obscured by competition with e-fuels, bio-LNG, and other upcoming pathways

Stratas Advisors

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LNG has traditionally been the only scaled lower carbon bunker fuel to meet carbon emission targets in the shipping sector. Upon LNG price spikes, biodiesel is emerging as another cost-competitive renewable bunker fuels over the short term. Interest in marine FAME surged over the past years through various sea-going trials and supply contracts to ports. Uptake is strong in Europe, particularly the Netherlands, as the host-country to the continent's largest port allocates tradable renewable fuel certificates (HBE) to fuel suppliers for blending renewable fuels in their bunker fuel consumed in shipping sectors. Outside of Europe, Singaporean players have selected FAME as an immediate marine fuel alternative to decarbonize its existing harbor craft and actively supported the bunkering of biofuel blends through shipping trial funding, public-private partnerships and a newly released provisional national quality standard for marine biofuels.

Over the medium term, biodiesel is expected to lose some market share to e-fuels, particularly e-methanol and e-ammonia, due to new production capacities established, incentives from the EU shipping decarbonization policies, and the increasing adoption of compatible vessels by shipowners. Blend walls and feedstock restraints limit the effectiveness of biodiesel in meeting the rising carbon emission reduction quota in shipping. Bio-LNG uptake is likely to grow fast since it generates more credits than almost any other pathways towards the EU advanced biofuel sub-mandates, and can be used in existing LNG-powered vessels and bunkering terminals.

E-fuels will likely be the backbone for decarbonizing international shipping over the long term. This is as less stringent fuel specifications in shipping open the door for a larger variety of e-hydrogen derived fuels in shipping than for aviation or road fuels, while EU policymakers are rolling out dedicated incentives for e-fuels in shipping. Biodiesel is projected to remain the most widely used biofuel in the shipping sector. The penetration of HVO is constrained due to strong competition with the aviation segment, where jet-range HVO (HEFA) is the only currently scaled low carbon fuel option. Despite policy support in Europe, global bio-LNG uptake will likely be hampered somewhat by logistical issues in feedstock supply and bunkering. Consistent growth in pyrolysis and HTL bio-oil supply over the long term due to relatively low feedstock prices, simple processing of abundant feedstock and the release of bio-oil specifications is expected to see this segment grow. Finally, bio-methanol is projected to see significant growth in shipping as well, given its compatibility with newly acquired fleets and recent investments in waste-based bio-methanol production capacity.

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