

Drivers on Alternative Fuels

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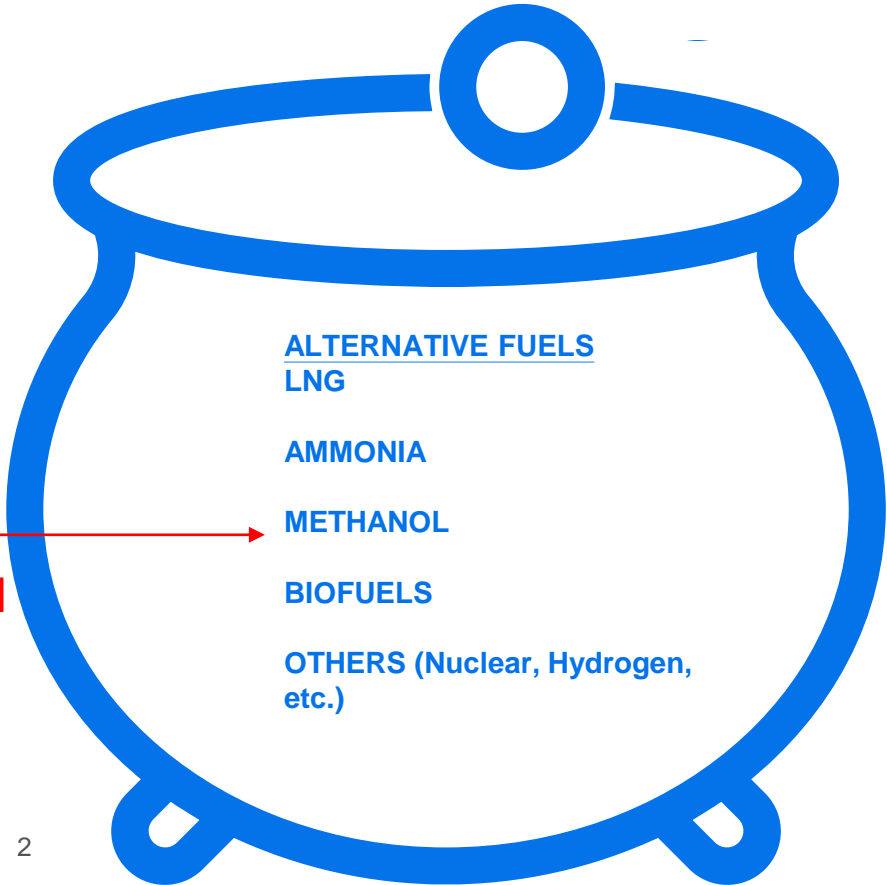
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Drivers on Alternative Fuels

Pricing is Key



- Green Premiums
- Regulation (Carrot and Stick)
- Technology
- Availability and Infrastructure



DRIVERS

- 1 **Green Premiums:** Shippers (Amazon, Ikea, Nike) willing to pay more for lower carbon voyages in Container sector (e.g. Hapag Lloyd winning the ZEMBA tender in April 2024), but Charterers involved with commodities (i.e tankers, bulkers, gas carriers) struggle to provide green premiums.
- 2 **Regulation (Carrot and Stick):**
 - At a global level, IMO’s **CII** and **EEXI** is a **stick**
 - At localized regions (e.g. Europe): EU ETS, Fuel EU Maritime (“**FEUM**”) provides both **carrots** and **sticks**
 - Avoidance is a plausible strategy (e.g. fuel inefficient vessels can avoid Europe)
 - IMO’s 2027 global carbon tax to be debated at MEPC82 next week
- 3 **Technology:** Measured using TRL (Technology Readiness Level).
- 4 **Availability and Infrastructure:**
 - **Availability.** Will alternative fuels be available worldwide?
 - **Scalability.** Can alternative fuel be scaled?
 - **Infrastructure.** Necessity to build end-to-end supply chain.

Pricing
is Key

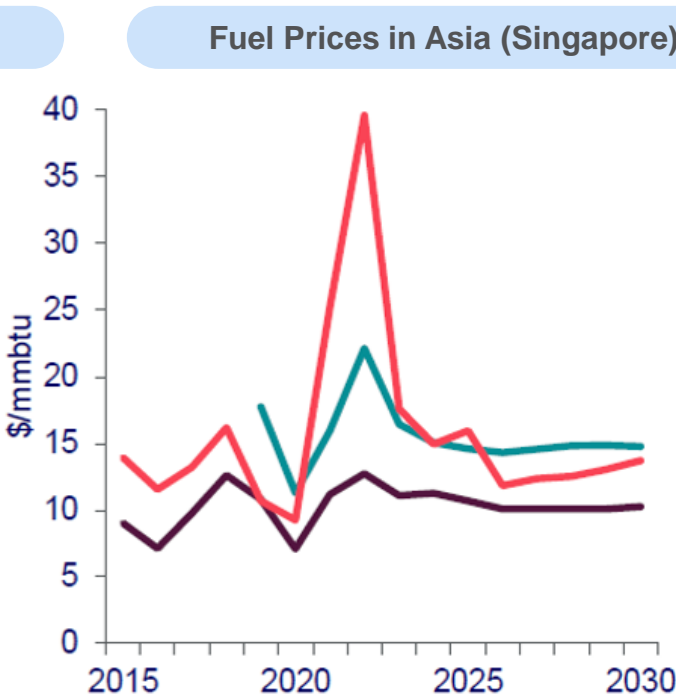
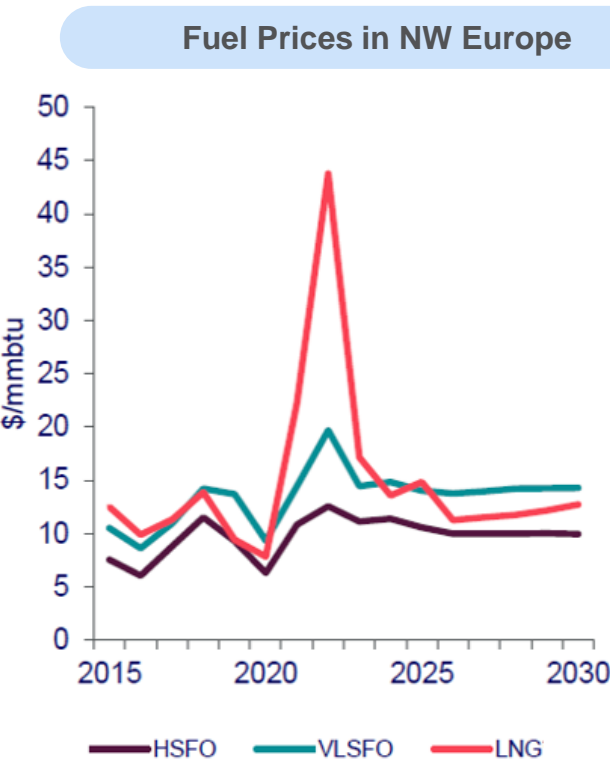
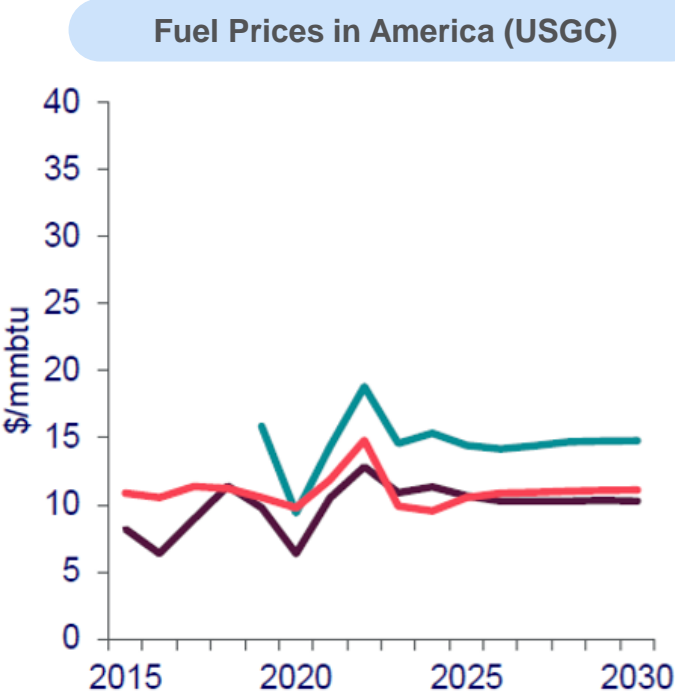
FOCUS TODAY WILL BE ON:
i) PRICING
ii) LNG, AMMONIA, METHANOL



LNG becoming Economically Viable

Key Takeaways

- LNG as a marine fuel was not economical in 2022 (Ukraine conflict)
- LNG prices (red line) in Europe and Asia have now fallen in line with VLSFO today (green line)
- LNG forecasted to become cheaper than VLSFO from 2026 onwards in Europe and Asia on the back of increasing supply



Source: Wood Mackenzie, June 2024



Testing Economical Viability of Ammonia and Methanol

Methodology

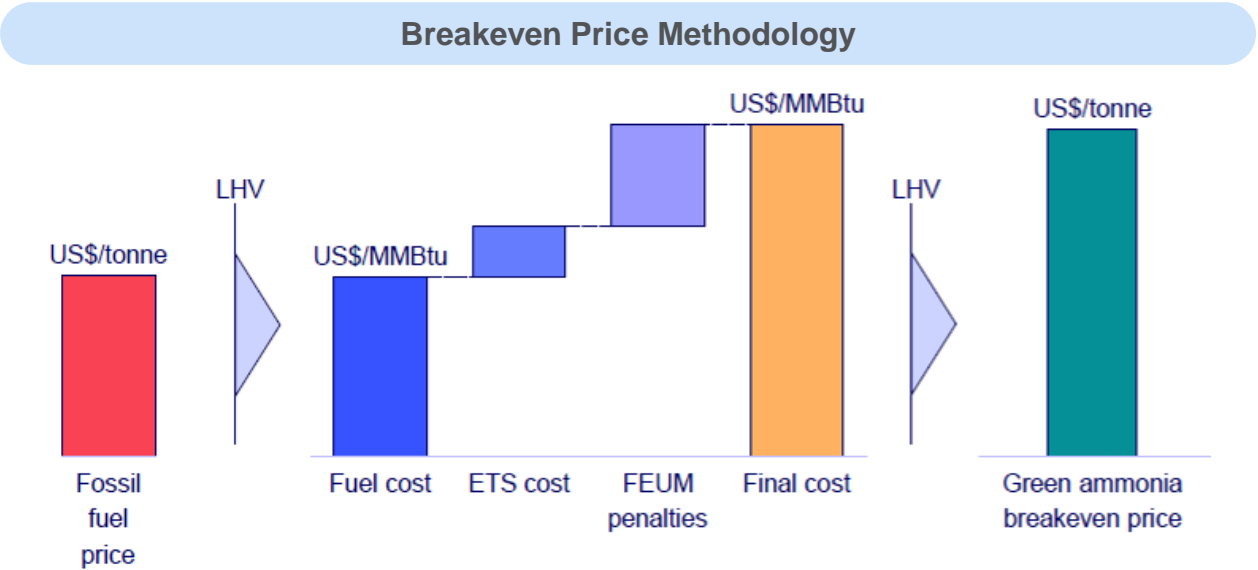
Breakeven Price defined as price ammonia / methanol needs to be sold to encourage owners to burn these alternative fuels without any additional targets or support policies

Methodology

Step 1 – Convert VLSFO from \$/tonne into \$/MMBtu to account for Lower Heat Value (LHV), defined as amount of heat released per unit of mass

Step 2 – Add on EU ETS + Fuel EU Maritime (FEUM) premiums

Step 3 – Convert back from \$/MMBtu into \$/tonne to get Breakeven Price



Source: Wood Mackenzie, June 2024

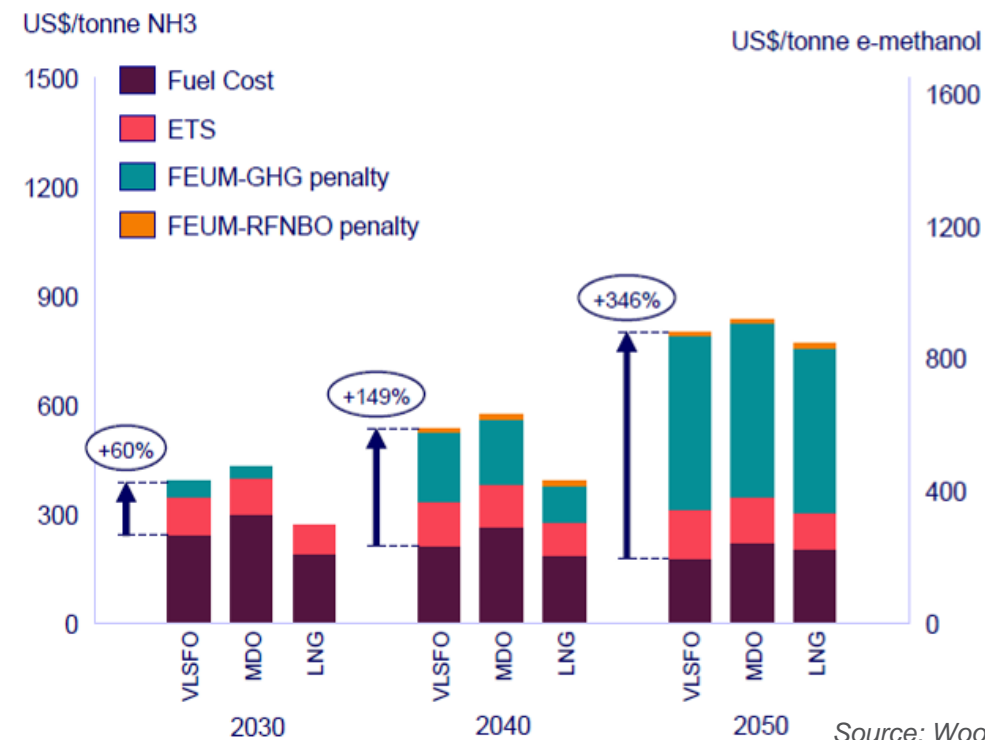


Breakeven Price of Ammonia and Methanol

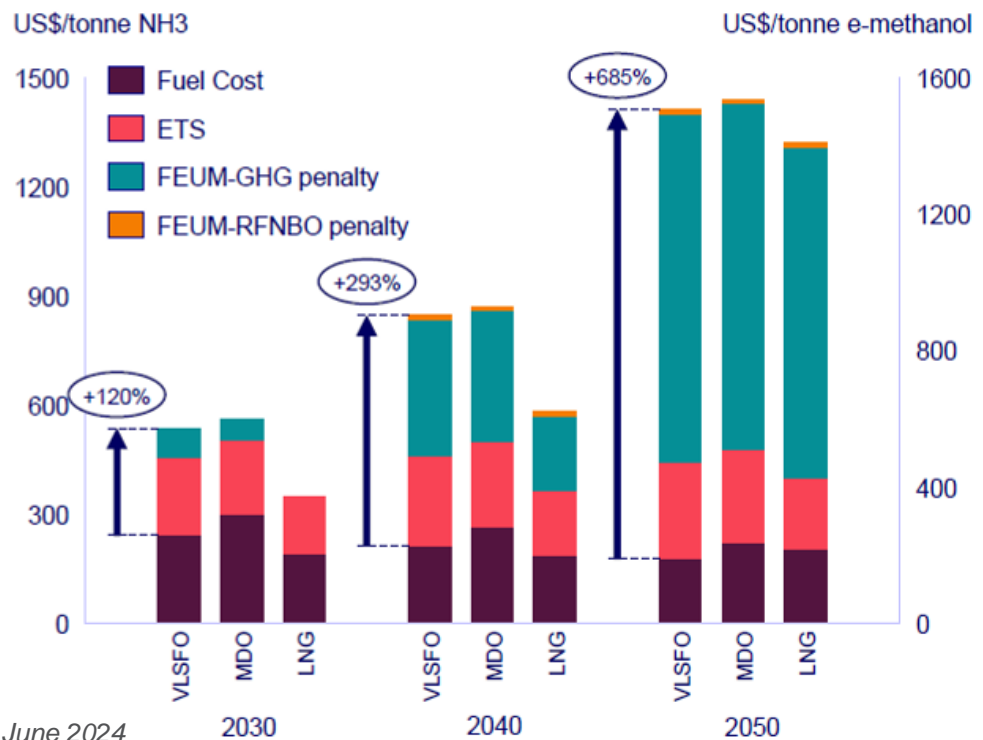
Key Takeaways

- By 2030, breakeven price for ammonia / e-methanol = \$400/tonne to displace VLSFO for extra-EU
- By 2050, breakeven price for ammonia / e-methanol = \$1400/tonne to displace VLSFO for intra-EU
- For reference, e-methanol being purchased at \$1100/tonne
- LNG seems the most economically viable until 2030

Ammonia and Methanol Breakeven Prices (extra-EU)



Ammonia and Methanol Breakeven Prices (intra-EU)



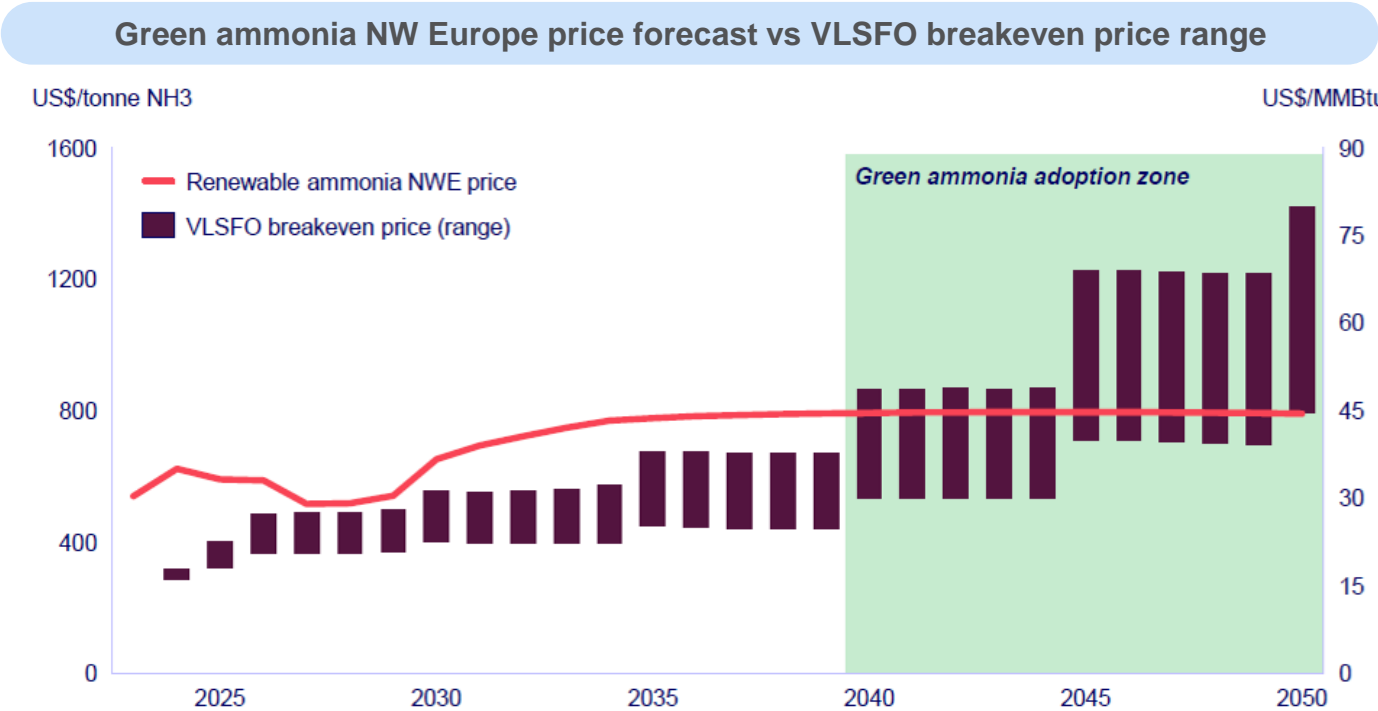
Source: Wood Mackenzie, June 2024



Ammonia to become economically viable by 2040

Key Takeaways

- Renewable ammonia price (red line) is the price forecast for purchase agreements in the year FIDs are signed.
- 2040-2049: Ammonia to become economically viable for intra-EU voyages
- >2050: Ammonia to become economically viable for all voyages starting or leaving a port within EU



Source: Wood Mackenzie, June 2024

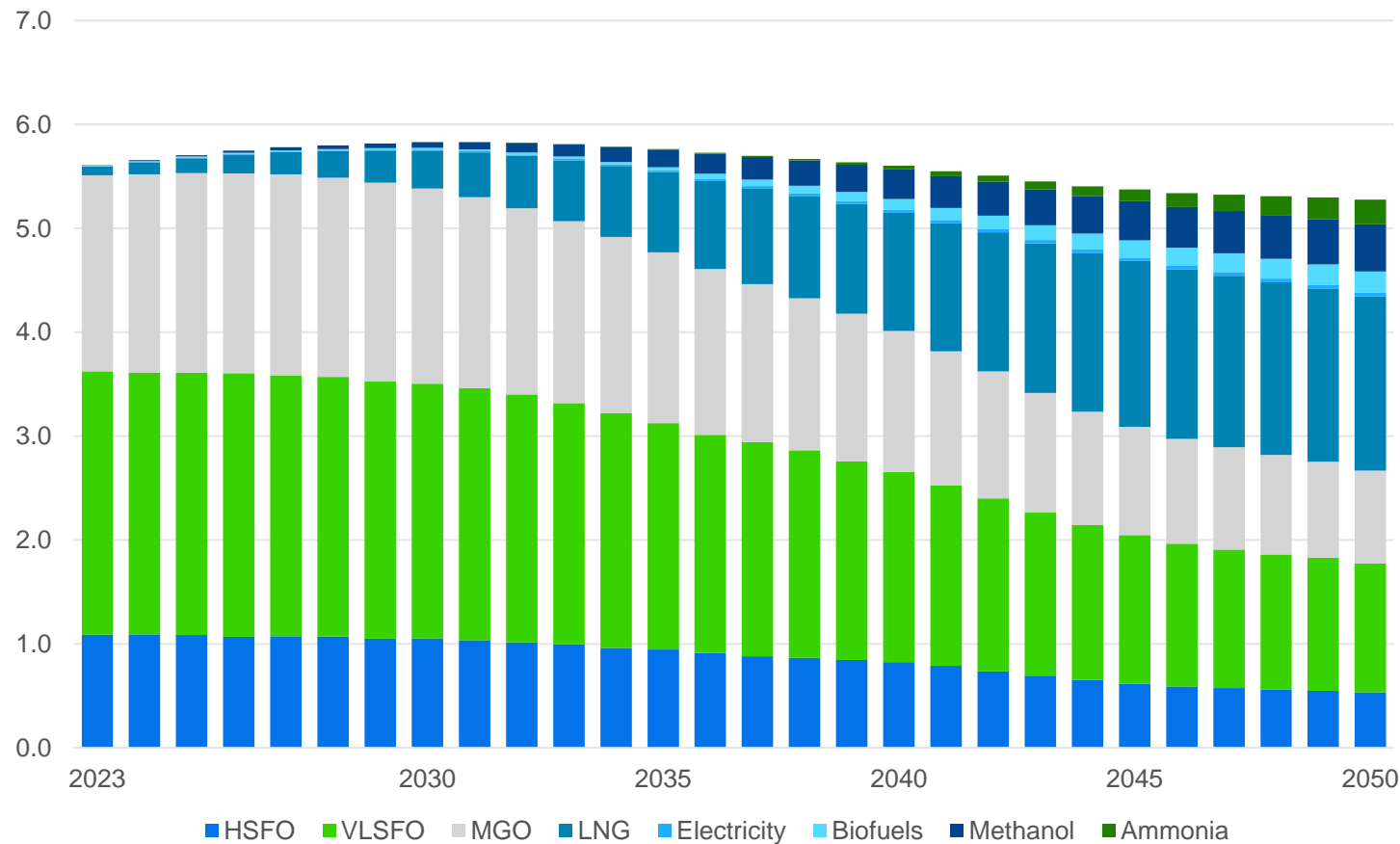


Marine fuel forecasts to 2050

Alternative fuels are expected to pick up in the early 2030s as fuel availabilities improve

Bunkering forecasts

Marine fuel forecasts by type 2023 to 2050
(mboepd)



- **Marine fuel consumption to peak at 5.8 mboepd before gradually declining until 2050**
 - Decline will be due to improvements in vessel efficiency (Shipping will move more goods but use less fuel)
- **LNG will be a key fuel**
 - Deep penetration of LNG until 2040, before stagnating due to the rapid growth of green fuel fleet
 - Economically viable
- **Biofuels expected to grow to 0.2 mboepd by 2050**
 - Initial uptake will be supported by EU ETS and FuelEU Maritime, as biodiesel blending in marine fuels reduce average carbon intensity of oil-fired ships
 - Although biofuels uptake in shipping accelerates in 2030s as biodiesel demand from road transport declines, competition for feedstock from other sectors (i.e. aviation) will limit higher penetration of biofuels in shipping
- **Methanol and ammonia consumption reaches 0.5 mboepd and 0.2 mboepd in 2050, respectively**
 - Early adoption of methanol over ammonia driven by containership companies
 - Ammonia adoption is expected to increase in the 2040s but methanol maintains the bigger share of the green fuel market due to early head start



Executive Summary

Key Takeaways

1) Industry will need all forms of alternative fuel to reach 2050 net-zero targets

- Every shipowner will have their optimal alternative fuel strategy depending on ship type / trade route / age of vessel

2) Fuel pricing will be extremely volatile

- No longer just about monitoring fuel oil, which correlates almost perfectly with crude
- Variables today include: Price of EUAs, IMO's global carbon tax in 2027, WTW calculations (IMO's LCAs), changing local regulations (i.e provision of subsidies or implantation of local carbon taxes), biofuels pricing driven by non-oil factors

3) Transition will be extremely dynamic and Standard Chartered is well positioned with deep experience

- Dedicated Transportation Finance team with local insights and global reach
- EU ETS hedging capabilities
- Industry leader in the sustainable and transition space, with end-to-end understanding of the global logistics and commodity supply chain



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