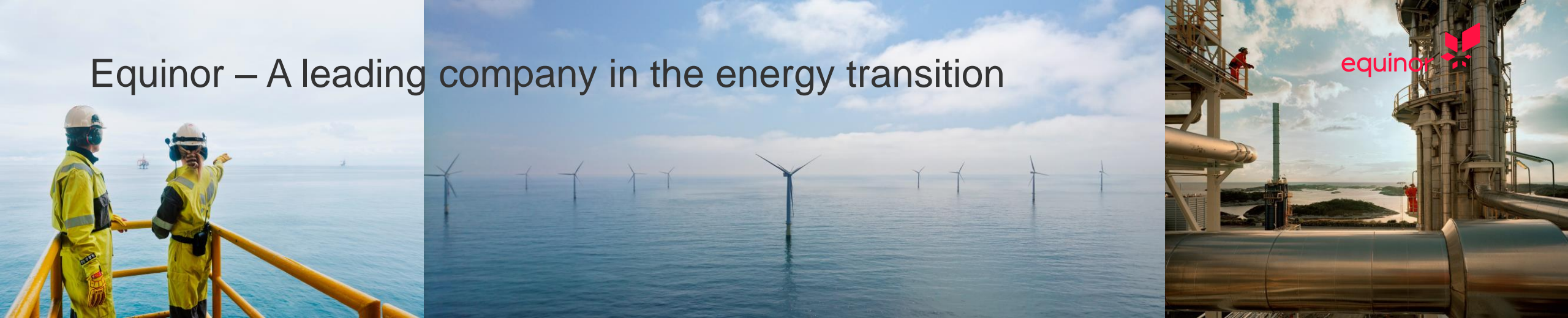


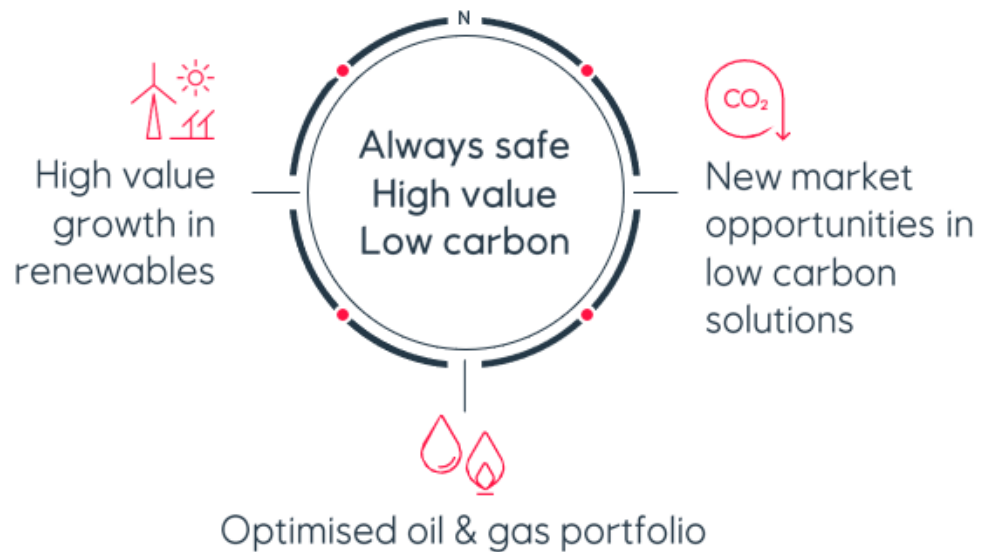
Emerging fuels: Challenges & Opportunities

2025.04.02 HySchoolDays 2025 Porsgrunn

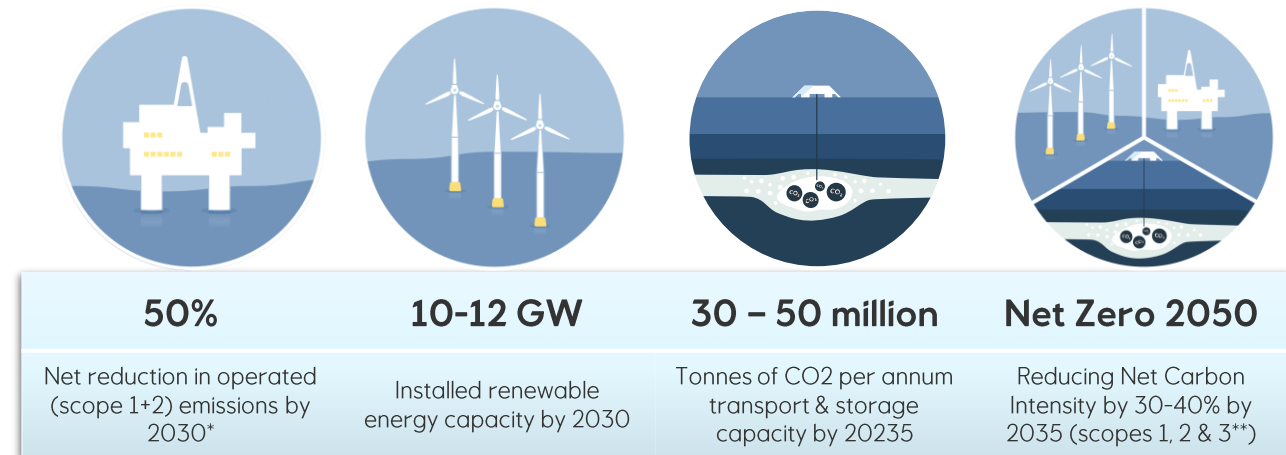
Equinor – A leading company in the energy transition



STRATEGY



OUR TRANSITION AMBITIONS



* Base year 2015; Equinor operated (100% basis); 90% to be met through absolute reductions.

** Includes scope 3 emissions from use of energy products that we produce.



Hard-to-abate transport sector

Alternatives for hard-to-abate transport sector:

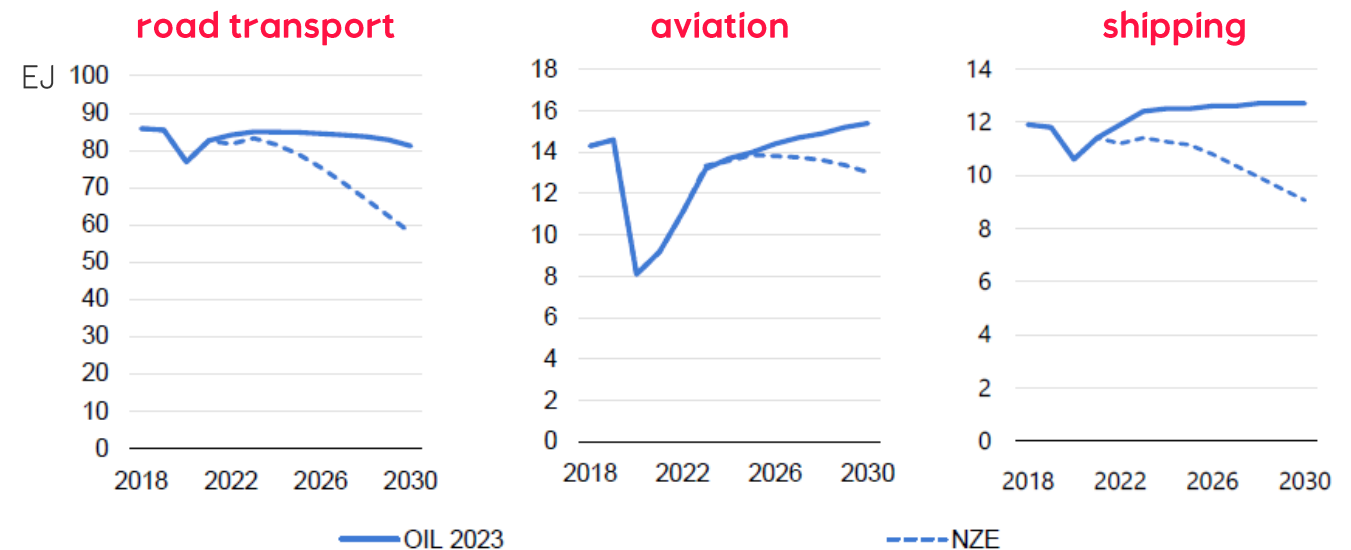
Aviation requires SAF
(Sustainable Aviation Fuel)

Shipping has different options, such as e.g.

- LNG (for next decade)
- Biofuels
- Ammonia
- Methanol

Transport sector oil demand

Figure taken from IEA report 'The Role of E-fuels in Decarbonising Transport' (Jan-2024)



OIL 2023 = data taken from IEA's Oil 2023 – analysis and forecast to 2028
NZE = Net Zero Emissions by 2050 Scenario

For reference: 1 EJ = ~24 Mtoe = ~450,000 bbl/day



Maritime regulatory framework

Norway

- 6% biofuel mandate

Fuel EU Maritime

- Starts 2025
- GHG intensity limits for ships in EU ports (-2% 2025, .., -80% 2050)
- Penalties for non-compliance
- Pooling options

IMO

- 20% GHG reduction by 2035





The alternatives – maturity

Implementation of alternative fuels has different barriers

- Feedstock availability
- Bunkering & onboard safety
- Regulatory issues

Fuel Pathway Maturity Map – taken from <https://www.zerocarbonshipping.com/>

	Feedstock availability	Fuel production	Fuel storage, logistics & bunkering	Onboard energy storage & fuel conversion	Onboard safety & operations	Vessel emissions	Regulation & certification
e-ammonia	■	■	■	■	■	■	■
Blue ammonia	■	■	■	■	■	■	■
e-methanol	■	■	■	■	■	■	■
Bio-methanol	■	■	■	■	■	■	■
e-methane	■	■	■	■	■	■	■
Bio-methane	■	■	■	■	■	■	■
Bio-oils	■	■	■	■	■	■	■
e-diesel	■	■	■	■	■	■	■
Bio-diesel	■	■	■	■	■	■	■

- Mature: Solutions are enabled and ready to scale
- Solutions identified: Solutions exist, but further development is needed
- Major challenges remain: Solutions are not fully developed or lack specification



The alternatives – cost

“With low prices and already established supply chains, fossil fuels are tough competitors to beat”

– Mærsk Mc-Kinney Møller Center
(Industry Transition Strategy, Oct 2021)

Estimated high/low fuel prices in 2030-2050 (incl. production and distribution cost)

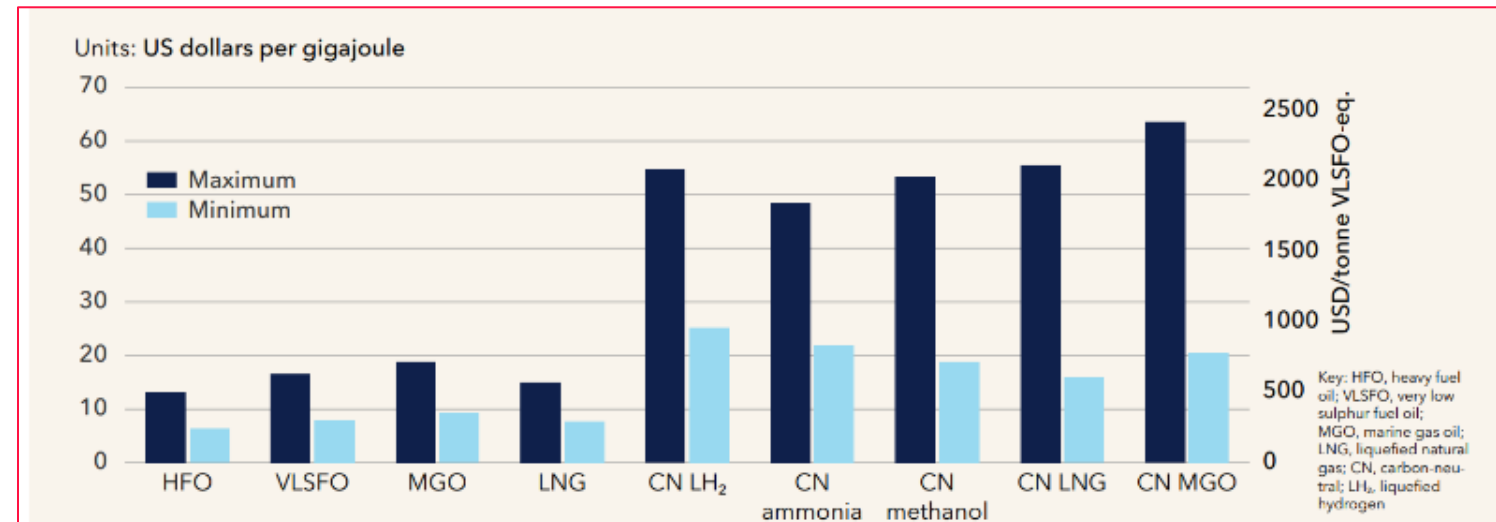


Figure from DNV Maritime Forecast to 2050 (2024)



Position of Equinor: value chain perspective

Fuel provider – via our onshore facilities

Tjeldbergodden

- Methanol production

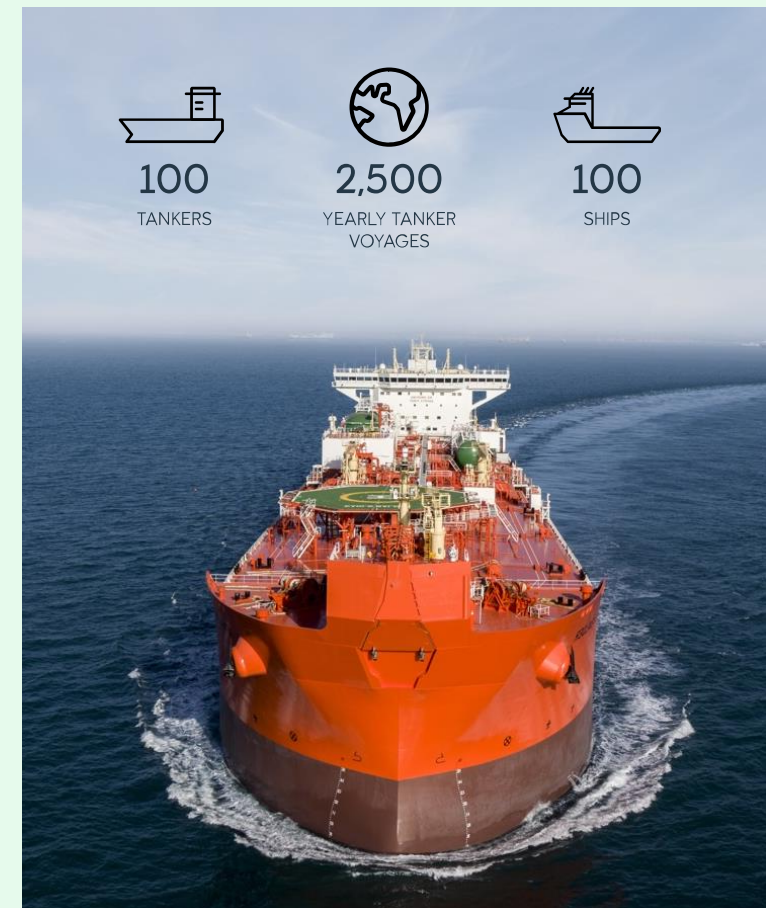


Mongstad

- Co-processing



Fuel buyer/user





Few examples

Trials and pilots

- HVO biofuel pilot on PSV and drilling rig in 2022
- FAME biofuel pilot on a tanker in 2022
- Ammonia powered PSV in 2026

Implementation

- Green methanol supply
- Dual-fuel methanol tankers

Reducing Carbon Footprint: Odfjell Drilling's Offshore Rig Successfully Tests Biofuel Operation

May 25, 2023



© Marius Oma
MarineTraffic.com

Deepsea Atlantic - ©Marius Oma
Norwegian offshore drilling firm Odfjell Drilling said via social media Thursday that it has, with oil firm Equinor, recently completed a pilot project operating an offshore drilling rig on renewable biofuel.

<https://www.oedigital.com/>



NEWS - 18 NOVEMBER 2022 10:12

Furetank pilots waste-based renewable fuel for Equinor



The dual-fuel tanker Fure Valö has performed the first voyage on a new Equinor fuel blend containing used cooking oil. It reduces greenhouse gas

<https://newsdesk.furetank.se/>

Press releases

Equinor and Maersk partner up to ensure continued green methanol supply for the world's first methanol-enabled container vessel

8 September 2023

Sustainability Ocean Transport Decarbonisation

Share



<https://www.maersk.com/>

EGM seals charter deal with Equinor for 4 wind-powered battery dual-fuel methanol tankers

VESSELS

April 9, 2024, by Naida Hakirevic Prevjak

EuroGreen Maritime (EGM), a French shipping company focused on sustainable maritime solutions, has entered into a seven-year charter agreement, with options for five one-year extensions, for four hybrid battery/dual-fuel methanol vessels with the Norwegian energy company Equinor.



<https://www.offshore-energy.biz/>

Equinor to use the world's first ammonia-powered supply vessel

📅 26 AUGUST 2024 12:00 (CEST) | LAST MODIFIED: 27 AUGUST 2024 14:11



www.equinor.com

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