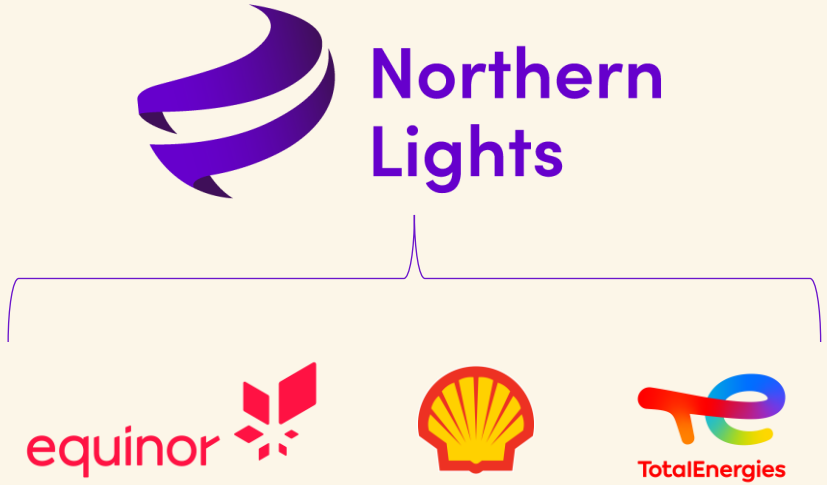

Northern
Lights

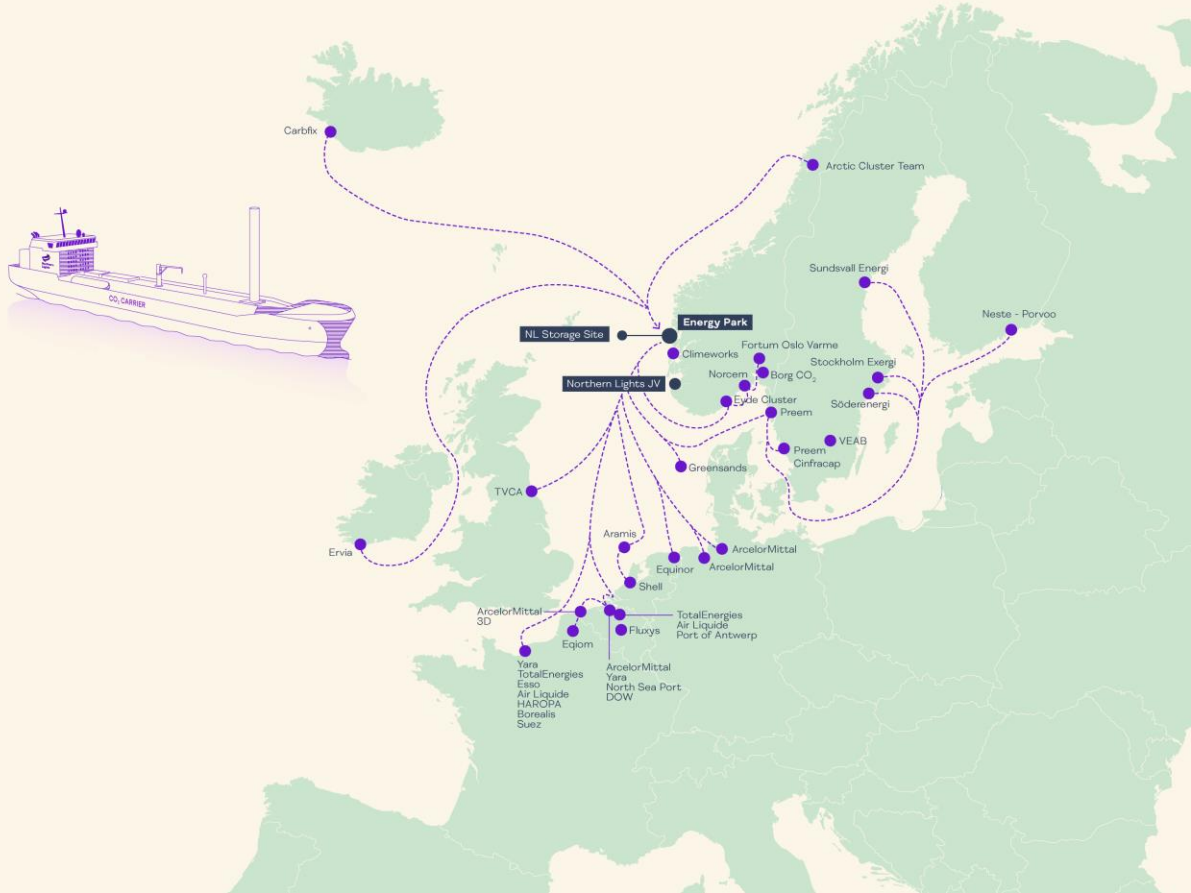
History and partnership construct

- → Injection technology developed for 25+ years at Equinor operated Sleipner field
- → From 2000: Several attempts to start CCS
- → 2016: The idea of a full value chain CCS project in Norway was born - the government played an active role
- → 2017: The formal co-operation with Equinor, Shell and TotalEnergies commenced
- → 2020: The Longship project was launched
- → 2021: Northern Lights JV DA established
  - NL JV is a Shared Liability (DA) company owned by 1/3 each by Equinor, Shell and TotalEnergies.
  - Northern Lights JV DA operator of Norway's first CO2 injection license (Aurora)



Longship

- → Northern Lights was born from the Norwegian State's Longship project
- → A demonstration of large-scale, end-to-end CCS value chain consisting of:
  - Cement manufacturing plant
  - Waste-to-energy facility
  - Northern Lights CO2 transportation and storage
- → Enabled by grants through a State Support Agreement
- → Longship has co-financed Northern Lights Phase 1 with a capacity of 1.5 million tons of CO2 per year
- → State participation critical to de-risk initial investment and operation period



Phased development

→ Northern Lights Phase 1

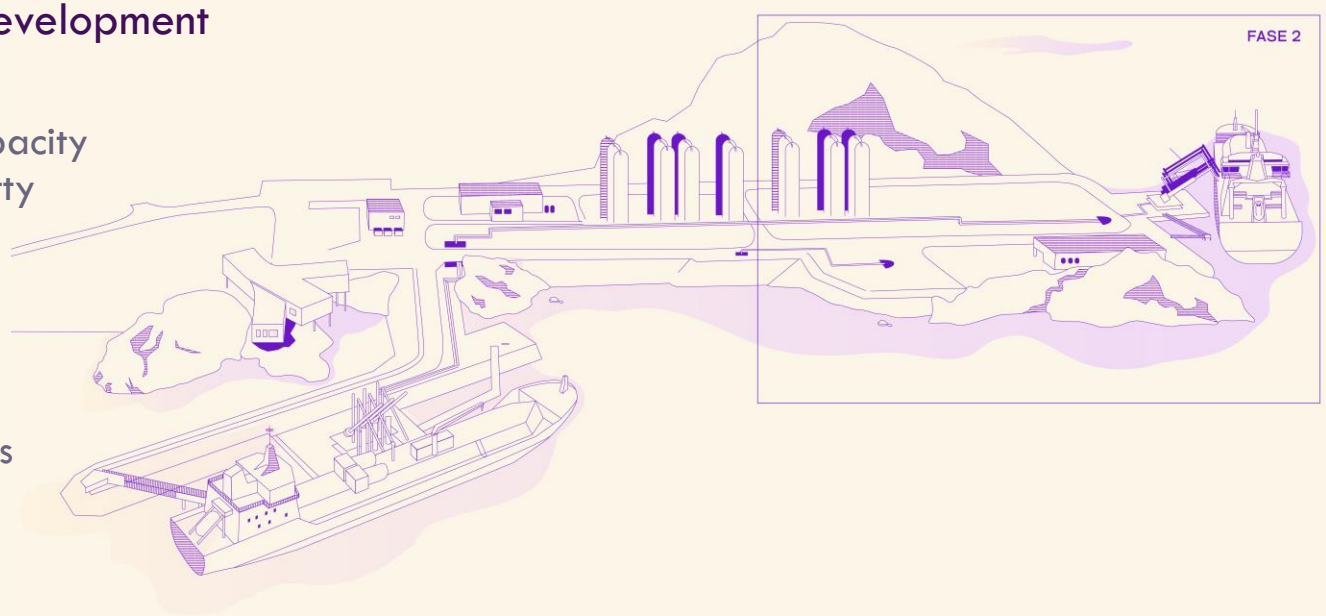
- 1.5 MTPA capacity, ready for start-up 2024
- 3 ships á 7,500m3 and 2 wells (one back-up)
- Phase 2 pre-investment in civil works and oversized pipeline
- Combination of commercial volumes and Longship volumes

→ Northern Lights expansion (Phase 2): commercial development

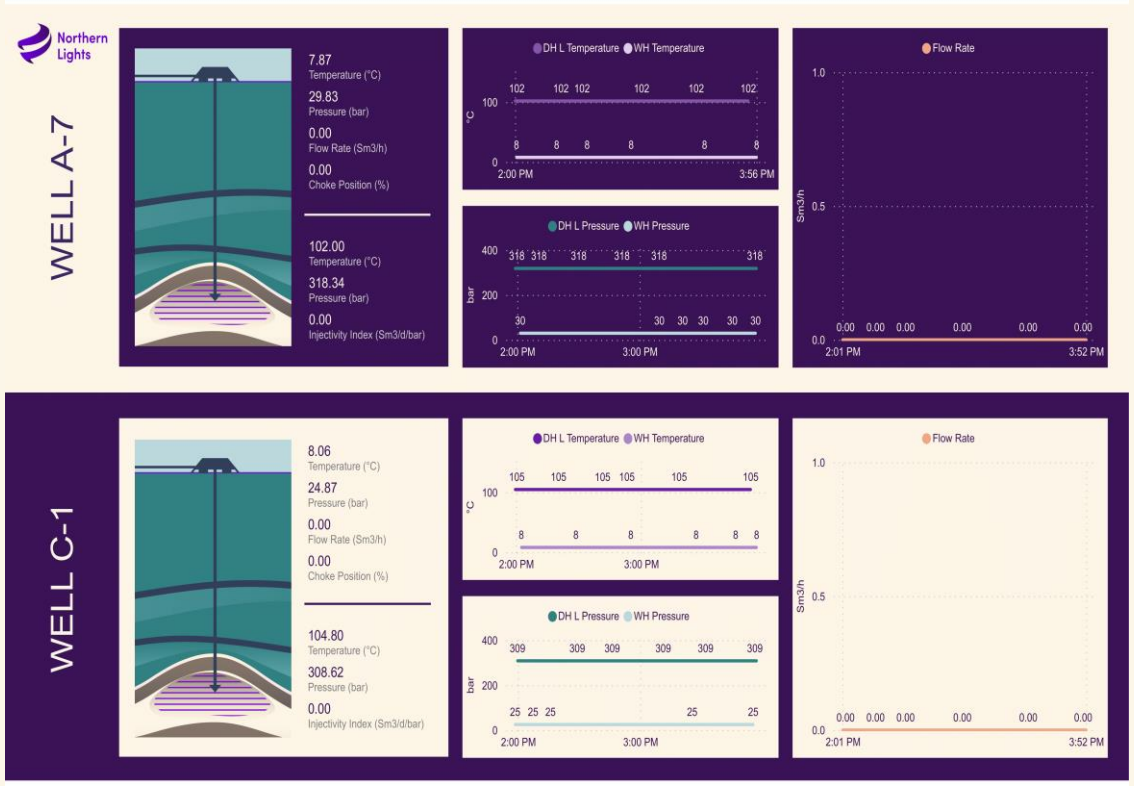
- "Filling the pipeline": 5-7 MTPA
- Additional ships, storage tanks, increased pump capacity and associated utilities, more offshore wells, new jetty

→ Growth

- Additional pore space
- Concept not yet determined
- Storage licenses actively pursued by several players



Last year was a significant year for CCS: On schedule and on cost!

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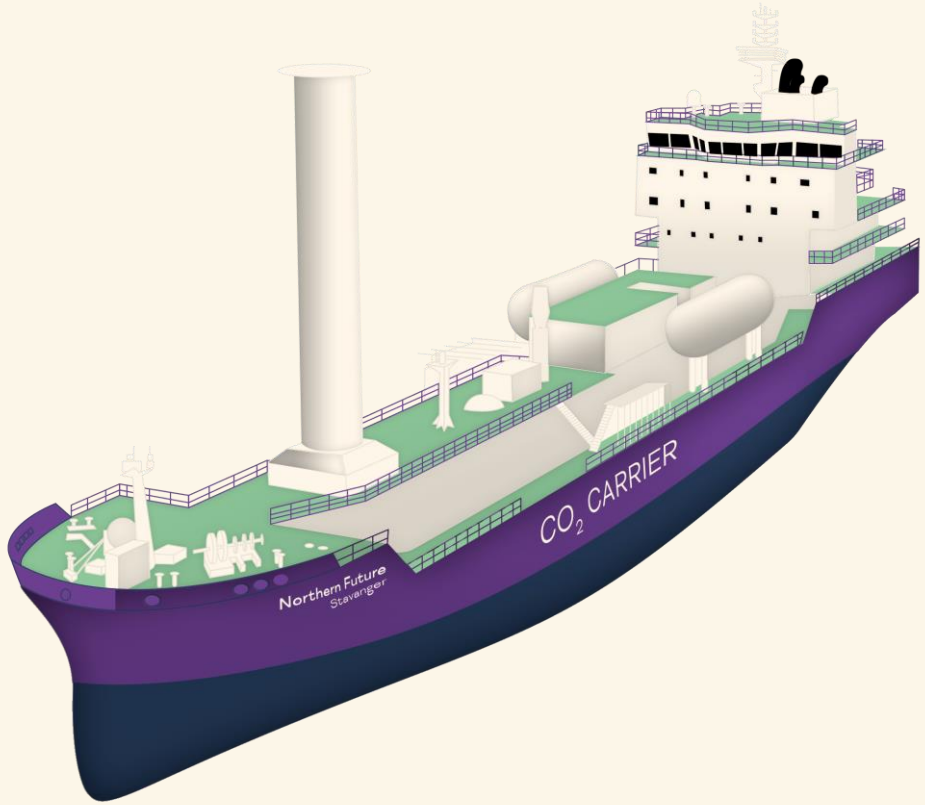
Ships

- World's largest custom liquified CO2 ships
- Cargo size: 7,500 m3 (265,000 ft3)
- Length: 130m (427 ft)
  - Medium pressure cargo containment
- App. 15 barg (217 psi) and -26oC (15oF)
- Purpose-built pressurised cargo tanks
- Primary fuel: LNG
- Wind assisted propulsion system and air lubrication will reduce carbon intensity by around 34% compared to conventional systems



Ship development

→ Status

- First two liquified CO2 ships under construction at Dalian shipyard in China
- Construction more than 85% complete
- Ships on schedule to be delivered in 2024
- Third sister ship ordered from DSOC in August 2023 for delivery second half 2025
- Fourth ship ordered in December 2024 again from DSOC

→ Observations

- Shipping market is tight given high demand for LNG vessels
- Increasing cost
- Long lead-times

→ Q: How can CCS “compete” in a heated oil and gas market?

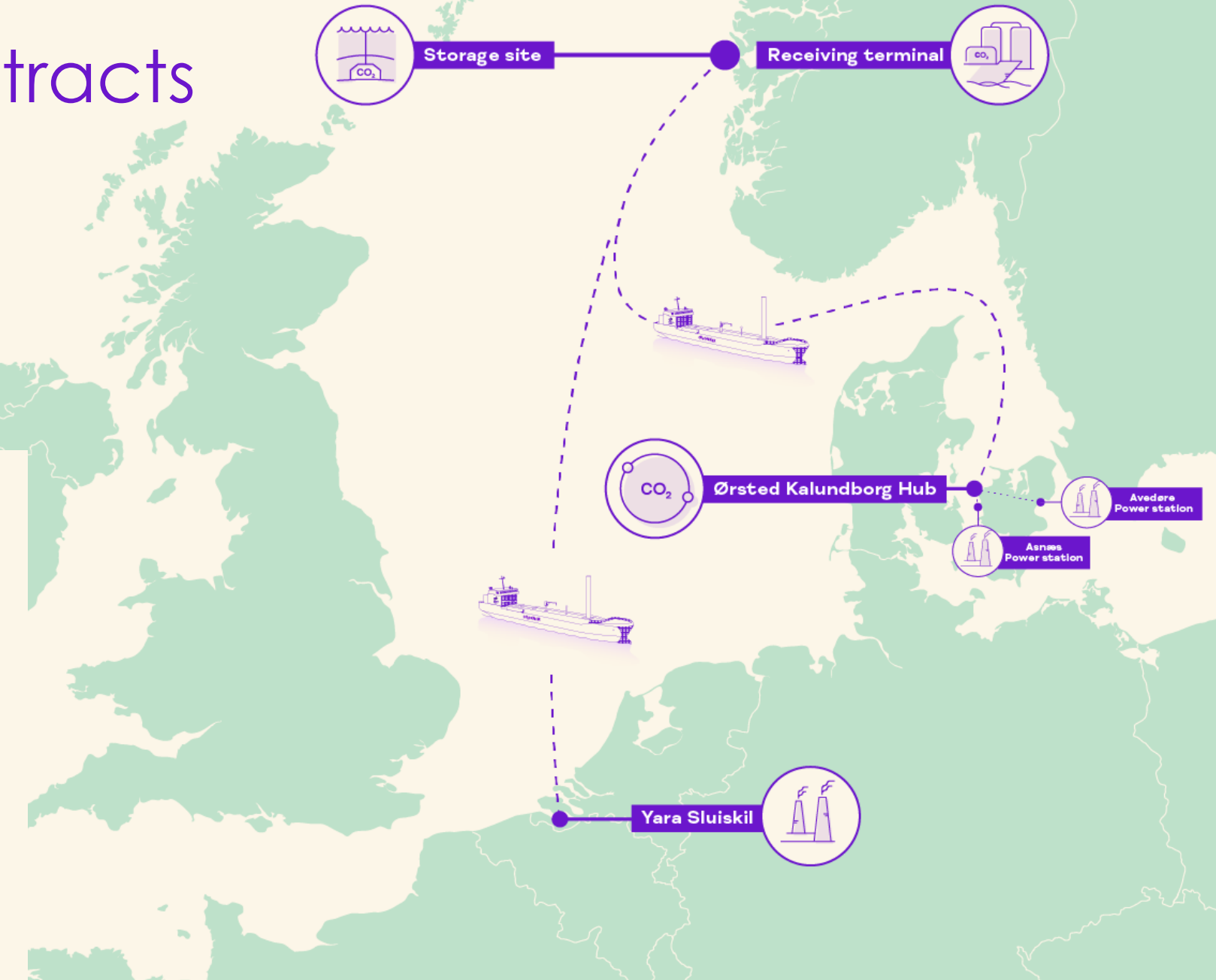
Commercial contracts

Ørsted

- → Bioenergy plants in Denmark
- → 430.000 tonnes CO2 annually

Yara

- → Ammonia and fertiliser plant in the Netherlands
- → 800.000 tonnes CO2 annually



Northern Lights

Credit: Reuters

Challenges

Northern Lights

Market Dynamics and Inflation

- Heated market with inflation and rising costs
- Yet, momentum for CCS has never been greater

Regulatory and Political Hurdles

- Bilateral agreements – London Protocol

Investment Uncertainty

- Financial security and predictability crucial for investments
- Long-term contracts and clear regulatory signals

Timing

- Time of essence for CCS to be a viable tool for climate mitigation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