

Northern Lights JV DA

Nordic Energy Research 13/12/2022

Torbjørn Wilhelmsen, Community Liaison





13/12/2022

5





3	Market situation	
---	------------------	--

4	Phase 2 expansion works
---	-------------------------



Northern Lights Public Private Partnership







Tina Bru, minister of Petroleum and Energy, Anders Opedal, Equinor CEO,









Ben van Beurden, Shell CEO, and Patrick Pouyanné Total CEO.



The concept





Northern Lights Storage Concept



- A dedicated license with no previous oil/gas operations Saline aquifer
- 3D seismic acquisition (monitoring base-line) almost finished



Receiving Terminal Øygarden



- \rightarrow Civil works completed
- \rightarrow Import jetty construction completed
- \rightarrow Project office and visitor centre is in place
- \rightarrow Fabrication and installation started
- \rightarrow Additional area for expansion included



Phase 1 Fabrication Activities Ongoing

Coating by Shawcor, Orkanger.





Fabrication of Egersund.



Flexible Shipping Solution

- \rightarrow Cargo size: 7,500 m3 (8000 tonnes CO₂)
- →Length: 130m
- \rightarrow Ready for delivery by mid 2024
- \rightarrow Purpose-built pressurised
 - cargo tanks for liquid CO₂
- \rightarrow Primary fuel: LNG
- →Wind assisted propulsion system and air lubrication installed



Expansion plans

- FEED Phase 2 scheduled ready early 2023
- FID planned 2023, subject to customer commitments
- Expected operational mid 2026





Phase 2 Capacity Expansion Scope







Co-financed by the Connecting Europe Facility of the European Union

EU Project of Common Interest (PCI)





- ✓ Infrastructure projects that link the energy systems of EU countries
- Eligible for European Connecting Europe Facilities (CEF) funding, accelerated permitting and authorisation processes
- ✓ Preselected for EU funding €4.25 M for Phase 2 FEED studies

Northern Lights is on the 5th PCI list with 18 promoters and 22 affiliates

- Capture potential of ~19 Mtpa in 2030 by promoters only (~32 Mtpa including affiliates)
- Promoters in Norway, France, Belgium, Netherlands, Germany, Sweden, and Finland
- Capture sites and promotion on standardisation





...and what about the market?



320 Mt CO₂ emissions are considered most relevant for European offshore CCS projects



European CO₂ Emissions in Global Context Gigatons CO₂ per year, 2019 Most CCS-relevant CO₂ Emissions** Megatons CO₂ per year, 2019



*Share of gas power emissions likely to be displaced **Not exhaustive, petrochemicals includes emissions related to steam cracking of primary petrochemicals ethylene, propylene, butadiene and aromatics Source: Rystad Energy research and analysis; UNFCCC



Building a market for CO₂ storage



\rightarrow Significant interest and demand for our services

→ Focus:

- deliver Phase 1, operational in 2024
- building a commercial business

\rightarrow Secure commercial contracts

- \rightarrow Investment decision for capacity expansion
- \rightarrow Hard to abate emissions from industry in Northern Europe
 - Process industry
 - Cement
 - Steel
 - Waste incineration
 - Negative emissions

\rightarrow Market potential: 319 MTPA

Key customer sectors



Strong potential but different levels of experience and maturity in respect to CCS

Cement	Chemicals/ refineries	(A)	Waste incineration	
Biofuels/bioenergy	Direct air capture		Steel	

Overcoming challenges of building a commercial business

Offshore CO₂Storage

2 600m

CO₂ storage < 100 km

Bergen

Stavanger



Ourrently no market for CO₂ handling and storage

- Technology is known
- Increasing cost of emission
- \rightarrow Establishing long term contracts
- \rightarrow Risk/reward allocation
- \rightarrow Significant need for infrastructure
- \rightarrow Adaption of regulatory frameworks



European CO₂ value chain

 \rightarrow Northern Lights is developing the first open source CO₂-transport and storage network.

> **DEC 23** €91.51

DEC 24

€96.75

DEC 25

Source

€104.50

- \rightarrow Offering flexible ship based transport and permanent storage.
- \rightarrow Discussions with potential customers ongoing.
- \rightarrow Expecting to sign first commercial contract in 2022.

EU ETS important

- The high CO₂ price helps put CCS on the agenda but it is too early to say if it is triggering investment decisions.
- We are experiencing high interest from industrial companies in countries with CO₂ taxation schemes on top of ETS. Typically these countries also offer support mechanisms for realisation of industrial climate change mitigation initiatives.

CO2 emission allowance A 111 **EUA Futures** €100 26/08/2022 €88.37 €80 €60 €40 €20 €0 2009 2010 2011 2012 2013 2014 2015 2016 2017 2019 2020 2021 2022 2018

EU ETS 26 August 2022



Source: https://sandbag.be/index.php/carbon-price-viewer/



Accelerating CCS

Doing what the O&G industry has perfected over 50+ years on NCS in ~10 years?





norlights.com