Northern Lights JV DA

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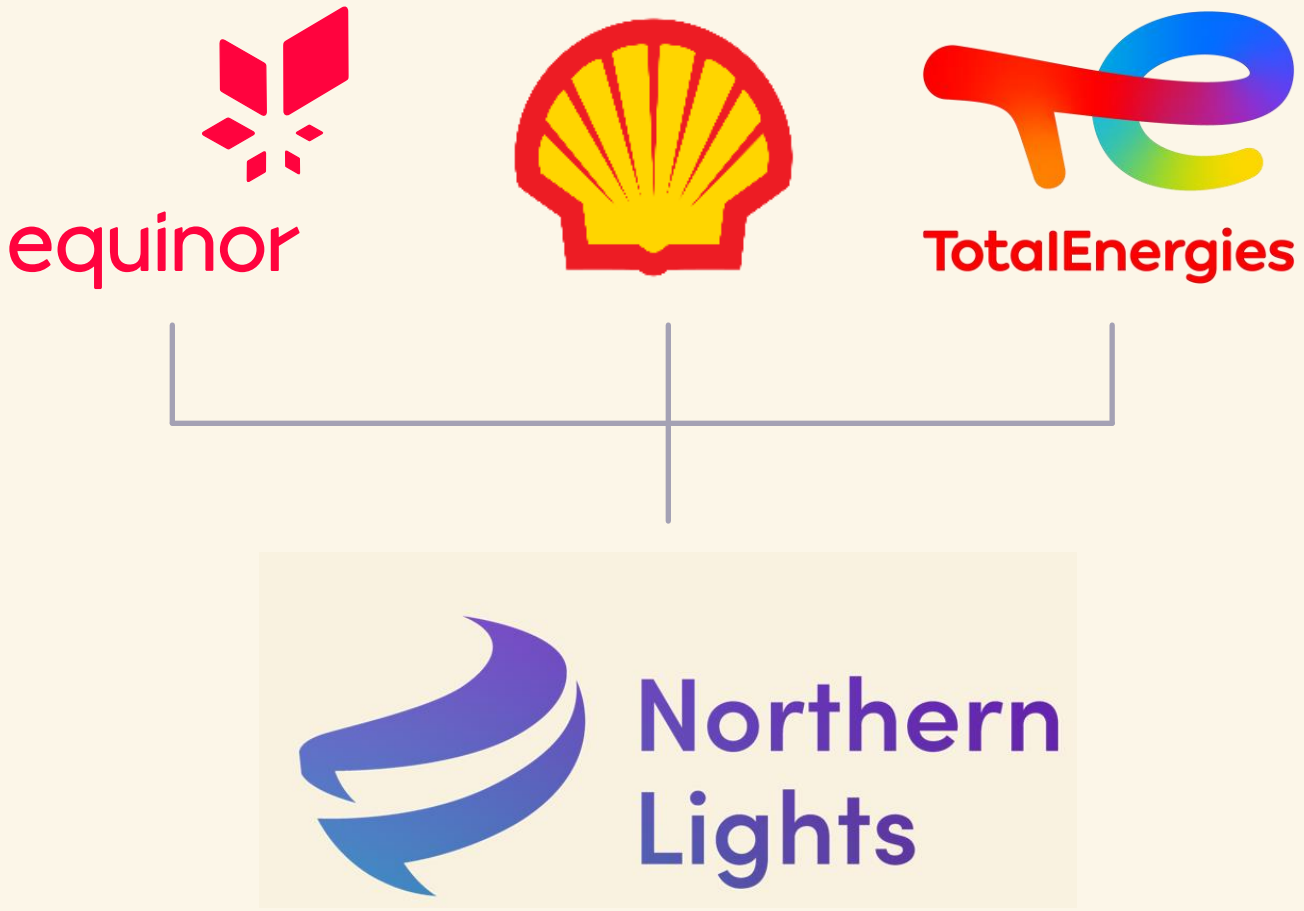
March 2022

Northern Lights Joint Venture

- Q1 2021 the Northern Lights JV was **formally established**
- The JV is owned by **Equinor, Shell and TotalEnergies**
- JV **employees are seconded** from the owner companies, aiming to employ dedicated staff in the future
- **Service agreements** are in place with the owner companies for parts of the scope



CO_2 transport & storage at scale

Northern Lights

NORTHERN LIGHTS SCOPE

CO_2 capture

Capture from industrial plants.
Liquefaction and temporary storage.

Transport

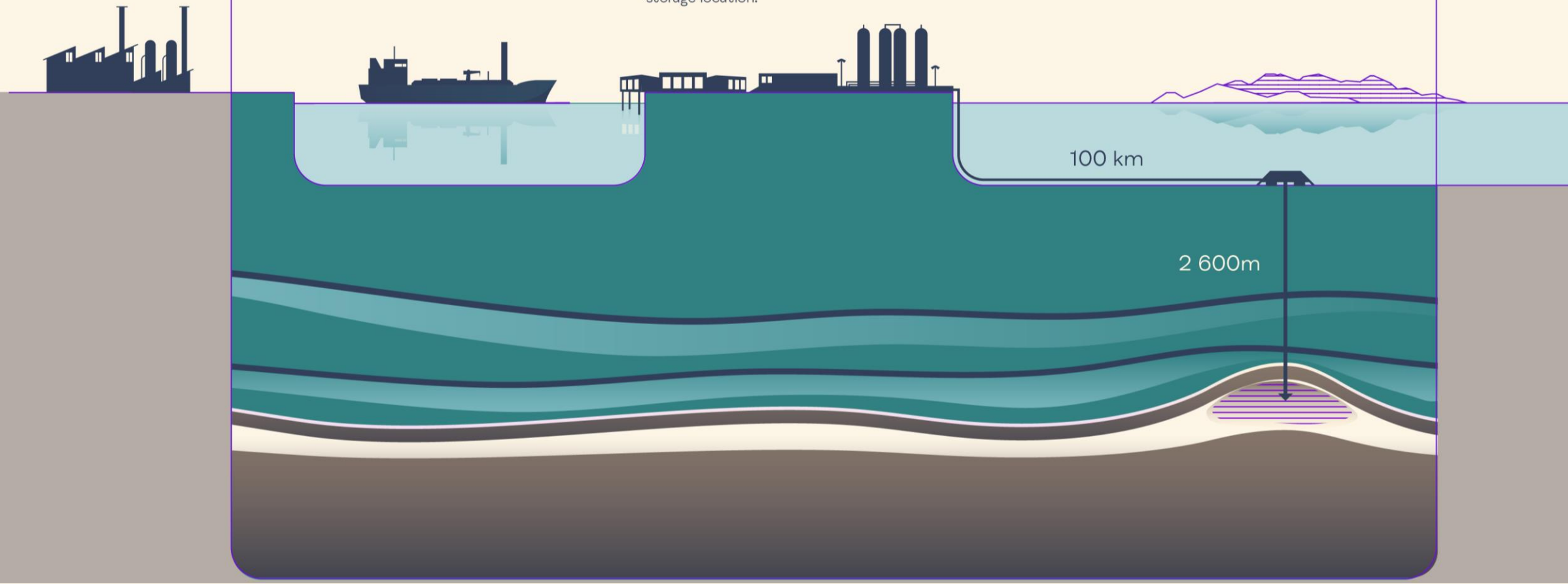
Liquid CO_2 transported by ship.

Receiving terminal

Intermediate onshore storage.
Pipeline transport to offshore storage location.

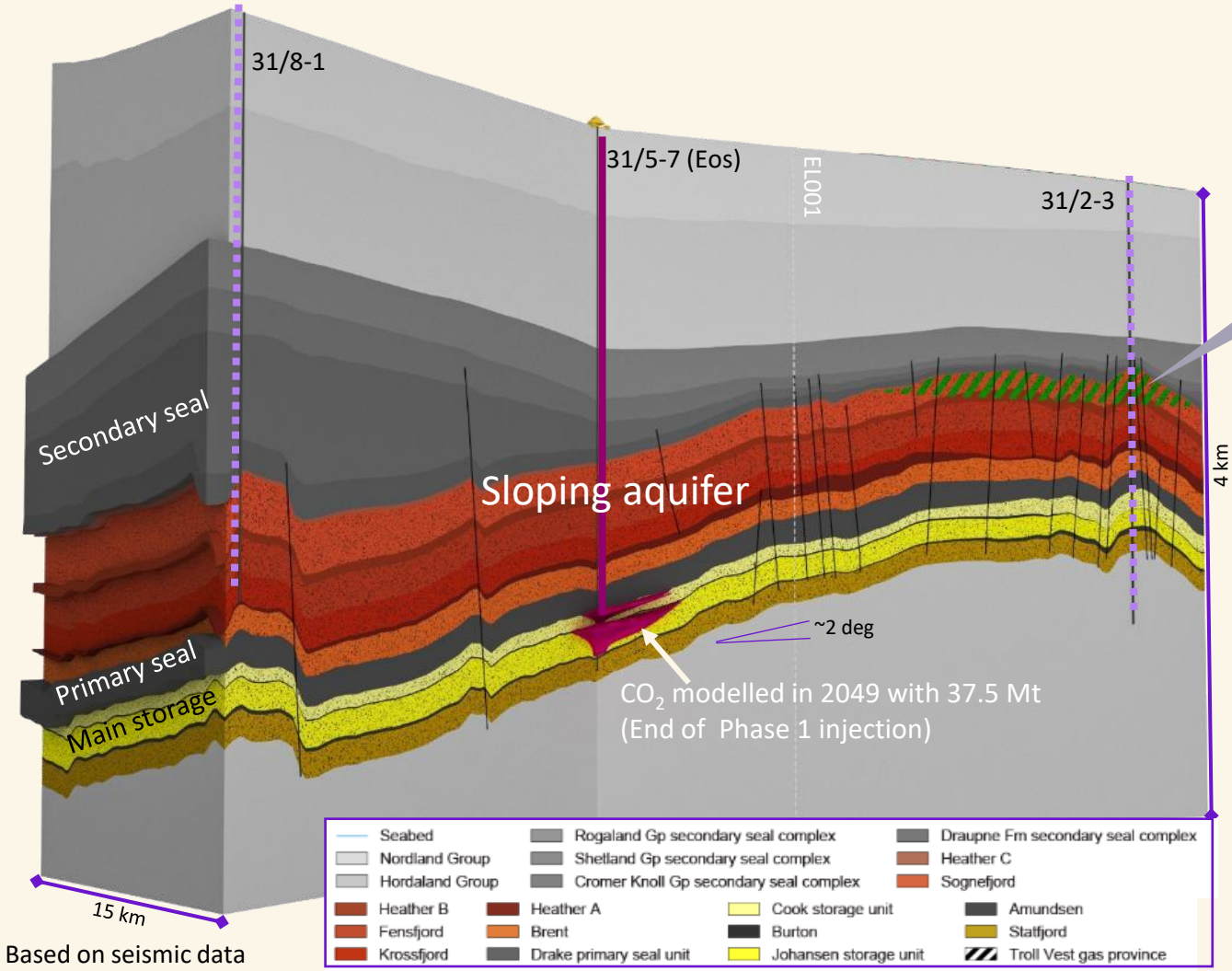
Permanent storage

CO_2 is injected into a saline aquifer.

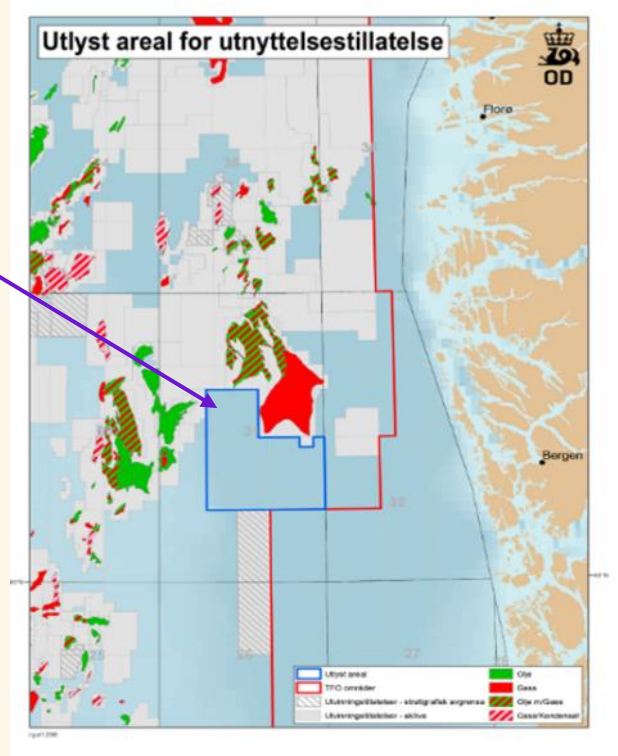


Northern Lights storage concept

Building on 25 years of experience; a dedicated license - saline aquifer



Based on seismic data from CGG



All data (83 GB) from well made public

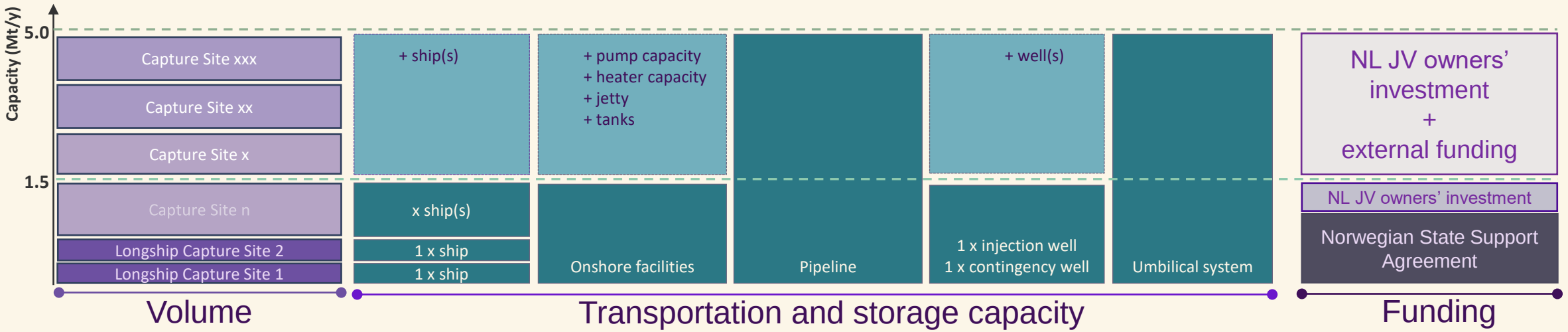
Northern Lights European CO_2 Transport EcoSystem (N-LiTES)

→ **Storage capacity being developed in two phases:**

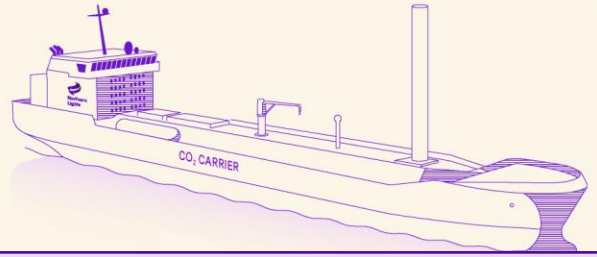
- Phase 1 → capacity to transport, inject and store up to 1.5 Mtpa of CO_2
  - Construction of both on- and offshore facilities commenced in 2021
  - Operational by mid 2024
- Phase 2 → capacity to transport, inject and store over 5 Mtpa of CO_2
  - Capacity to be increased as demand grows across Europe
  - Part of the Phase 1 infrastructure has already been designed to 5 Mtpa capacity (pipeline and umbilical)
  - Ambition to be operational by 2026

→ **PCI storage capacity needs to scale up beyond Phase 2 in line with the market development, and availability of funding**

- Possible Phase 3 from 2028



EU Project of Common Interest (PCI)



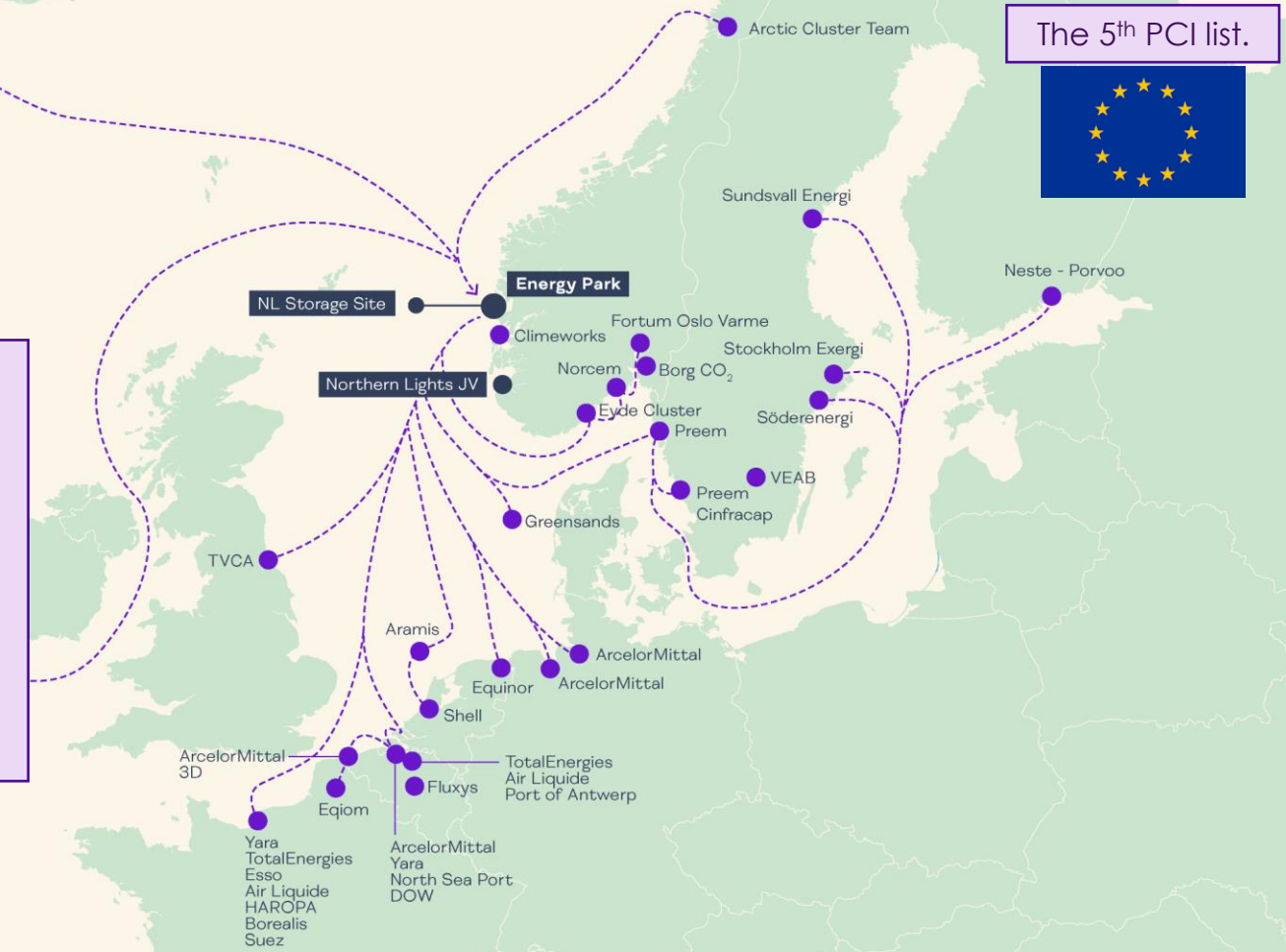
Northern Lights has been accepted to the 5th list with 18 promoters and 22 affiliates

- 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

Customer portfolio differs per country

- Chemical industry / clusters
- Fertiliser industry
- Refinery
- Steel industry
- Cement industry
- Waste Incineration
- BioCCS
- DAC

The 5th PCI list.

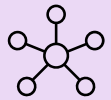


High-Level Commercial Principles

Northern Lights

#	Key Item	How does it work
1	**Contract quantity**	• Firm commitment to deliver/receive an Annual Contract Quantity • Northern Lights JV is to take delivery of the Annual Contract Quantity
2	**Volume flexibility**	• Supply-or-pay & take-or-pay principle on Annual Contract Quantity • Delivery above Annual Contract Quantity, subject to mutual agreement
3	**Service Fee structure**	• Competitive price relative to alternative decarbonisation solutions • Fee structure to ensure robustness over time
4	**Contract Duration**	• Longer term commitment
5	**CO2 Delivery Point**	• At customer's jetty/quay
6	**CO2 Title and Risk Transfer**	• At CO2 Delivery Point • Northern Lights JV is to perform metering and report quantity upon discharge
7	**CO2 Quality**	• Customer is accountable for delivering on-spec CO2 • Customer is to measure and report quality prior to loading
8	**Ship(s) and Shore Terminal**	• Northern Lights JV to perform shipping • Parties to comply with International Standards
9	**Conditions Precedent**	• Government approval for export of CO2 amongst others
10	**Governing Law**	• Norwegian law to govern the Transport and Storage Agreement • Dispute resolution through arbitration at independent geographical venue – English language

CCS fundamentals



Marketability

Customer centered Service that meets the demand

Cross border CO2 transport

Standardisation across the North Sea

Profitability

Economies of scale

Competitive funding / Access to capital

Fiscal/regulatory frameworks

Affordability

Cost reduction

R&D – New technologies

Digitalization

Supply chain

Reliability

Zero tolerance to safety issues

Zero emissions

Acceptability

Knowledge sharing

Climate policies

Northern Lights JV

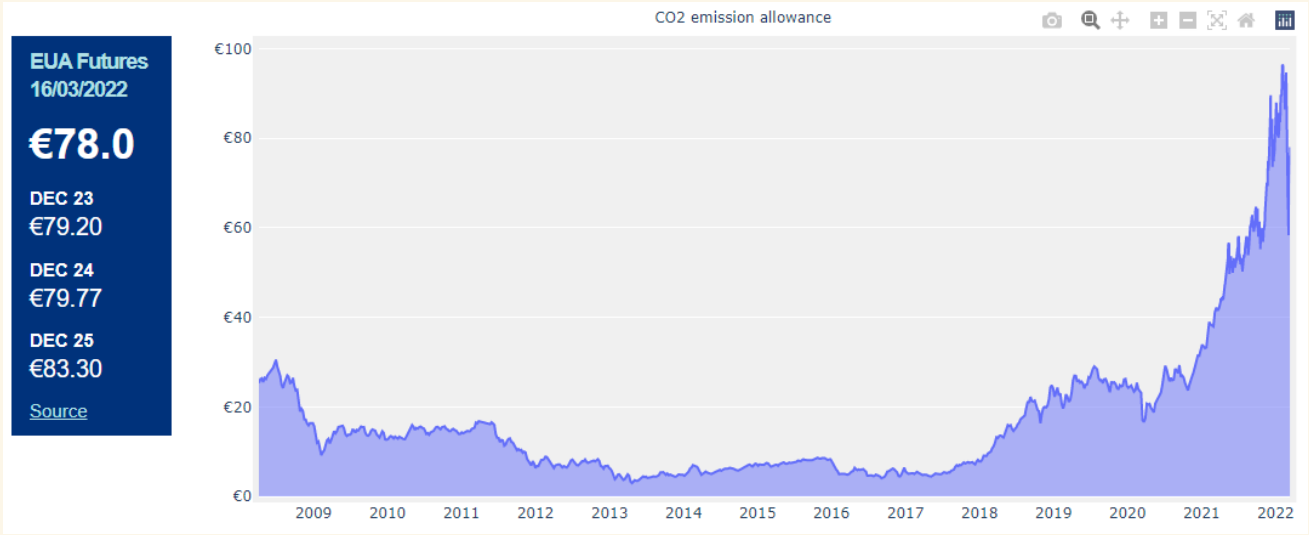
European CO_2 value chain

- → Northern Lights is developing the first open source CO_2-transport and storage network.
- → Offering flexible ship based transport and permanent storage.
- → Discussions with potential customers ongoing.
- → Expecting to sign first commercial contract in 2022.

EU ETS important

- The high CO_2 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 CO_2 taxation schemes on top of ETS. Typically these countries also offer support mechanisms for realisation of industrial climate change mitigation initiatives.

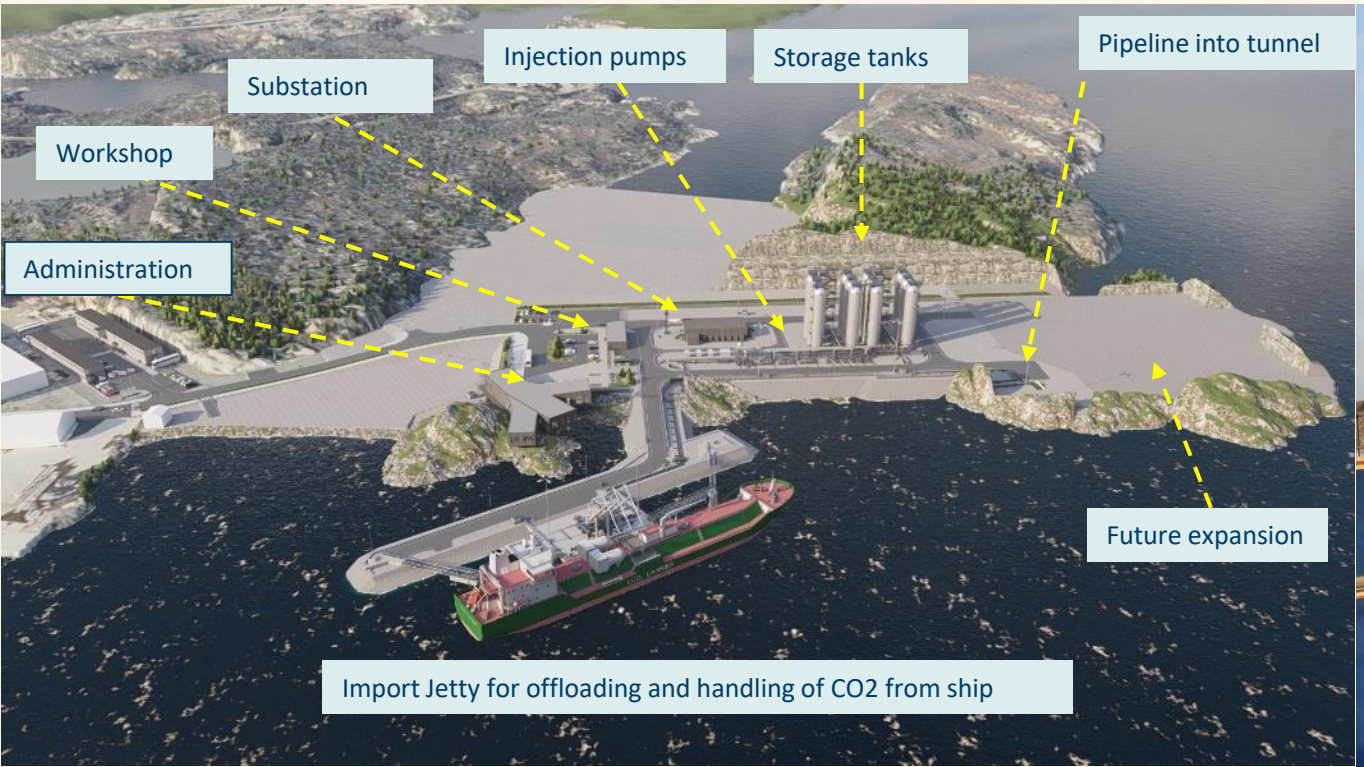
EU ETS 16th March 2022



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

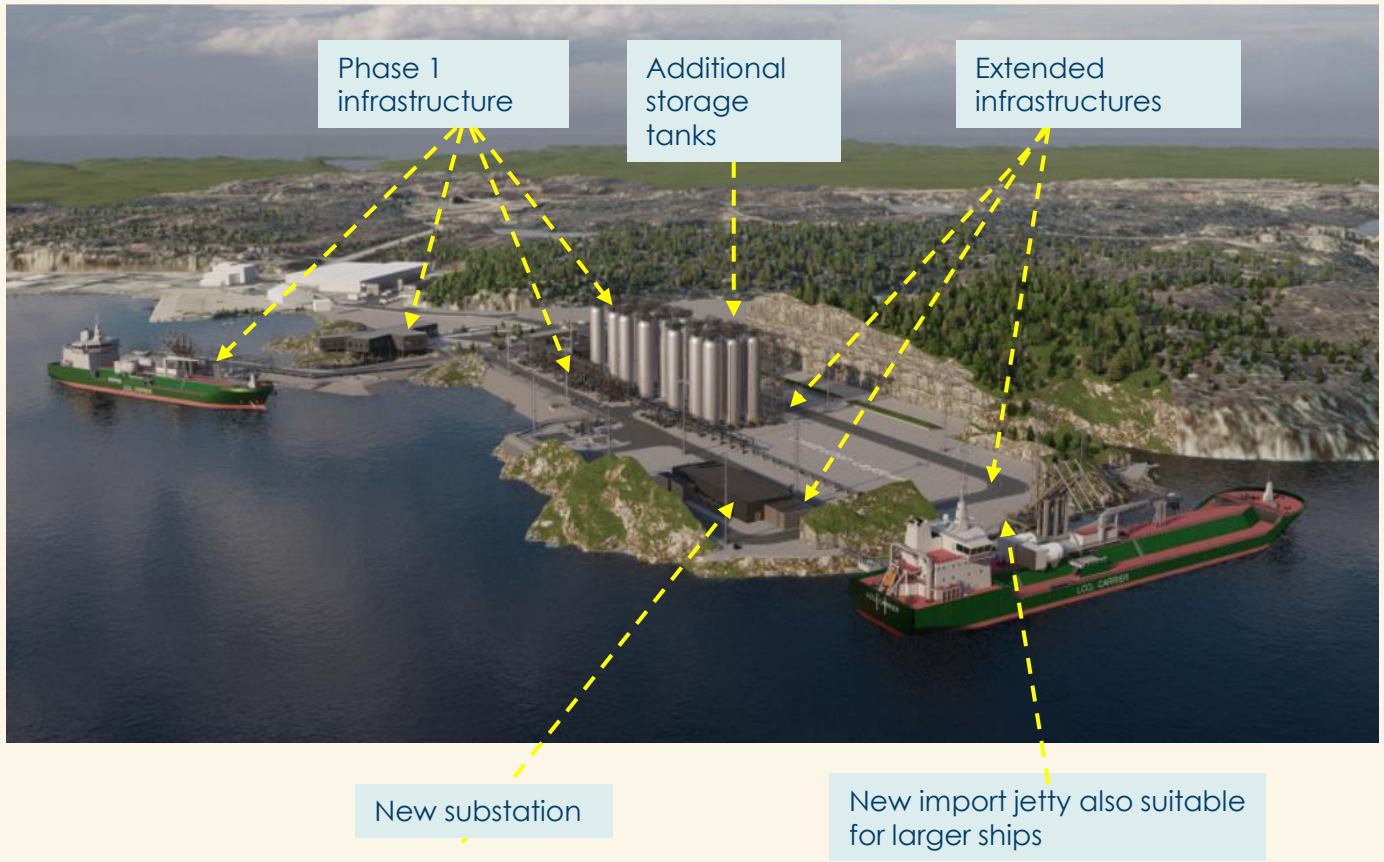
Receiving terminal Øygarden

- → **Civil works completed**
- → **Import jetty construction well under way**
- → **Project office and visitor centre in in place**
- → **Detail engineering and procurement ongoing**
- → **Fabrication and installation of plant started**
- → **Additional area for expansion included**



Phase 2 scope of work

- → **Additional area for expansion included and prepared**
- → **Integration with Phase 1**
- → **Additional connected storage with Phase 1 (temporary storage tanks)**
- → **New pumping unit, new substation, control system update**
- → **New/extended utilities**
- → **New jetty**
- → **SURF expansion (additional structures for additional wells)**
- → **Drilling & completion wells 3,4,5**



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

Northern Lights shipping solution

- **Ship building contracts awarded October 2021 (two vessels)**
- **Cargo size: 7,500 m3 (8000 tones CO_2)**
- **Length: 130m**
- **Ready for delivery by mid 2024**
- **Designed to transport liquid CO_2**
- **Purpose-built pressurised cargo tanks**
- **Primary fuel: LNG**
- **Wind assisted propulsion system and air lubrication installed**
  - Will reduce carbon intensity by around 34% compared to conventional systems
- **To be registered in Norway (NOR)**
- **Aditional 9 vessels needed (post Phase 2 FID)**

Northern Lights

norlights.com