

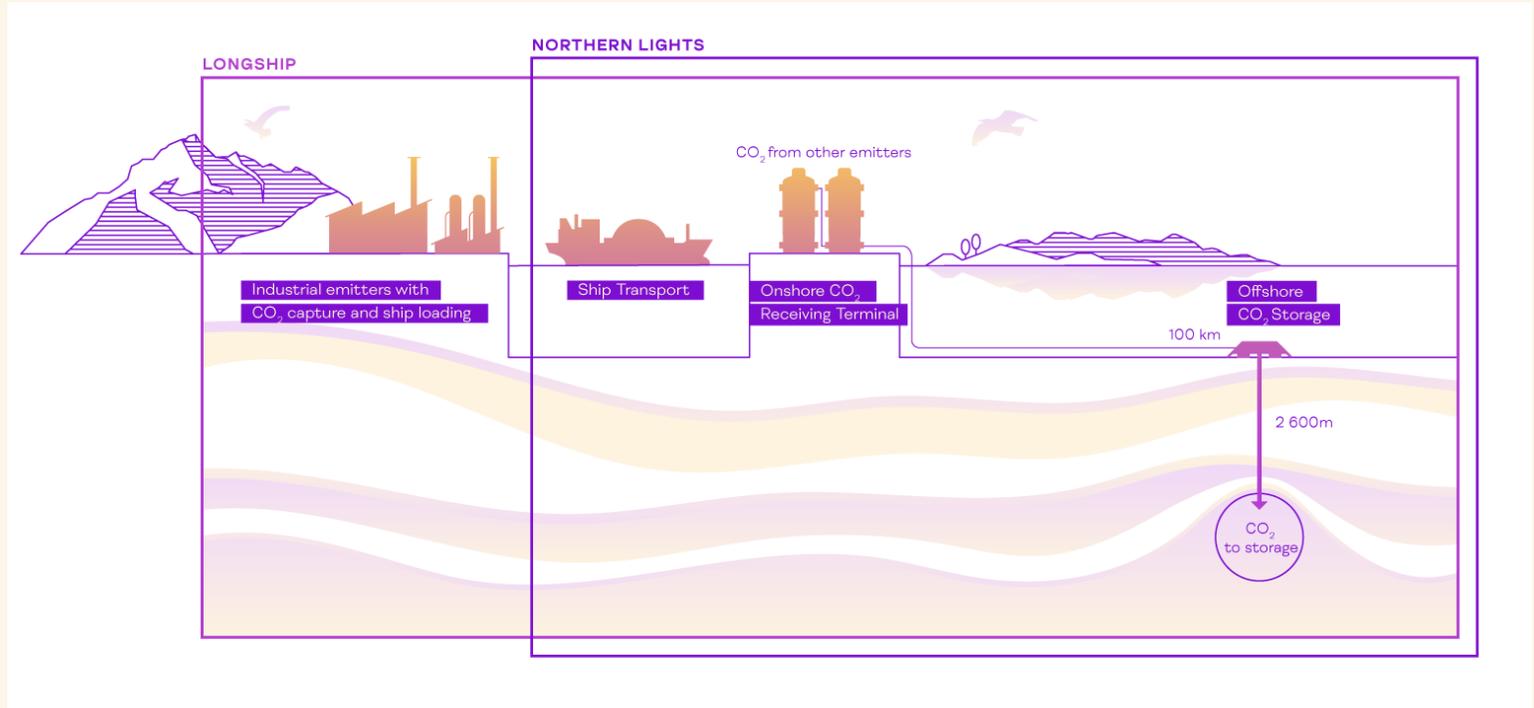
Northern Lights - A European network for transport and storage of CO₂

Elise ROC (NL JV Business Development) – CCFN Forum 10 03 2021

Longship & Northern lights a pioneer project

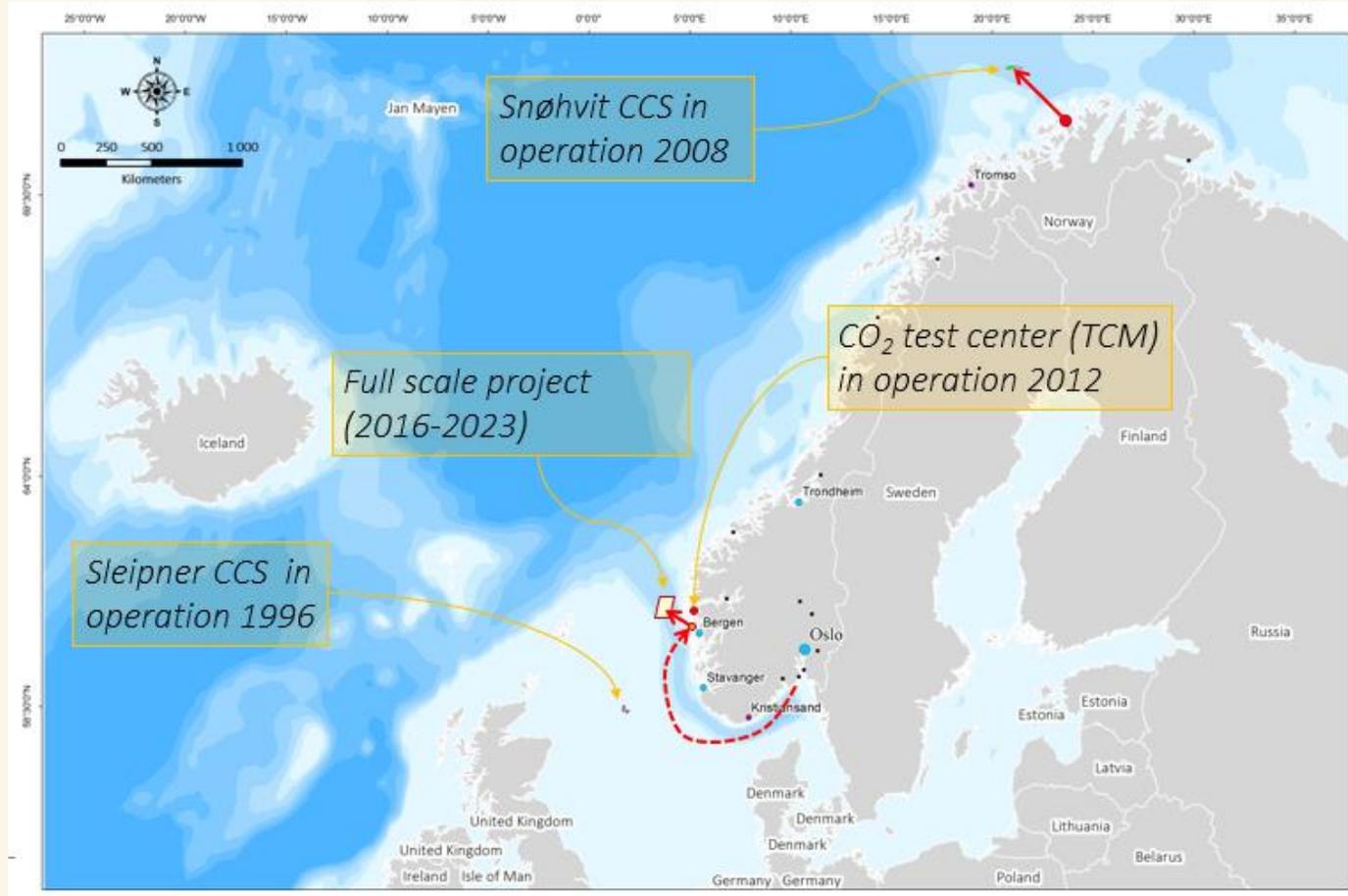


- A national ambition supported by the industry
- The strength of 3 majors: Total, Equinor and Shell
- First global industrial-scale CO₂ capture and storage project
- Allow the decoupling of the emitter location from the storage



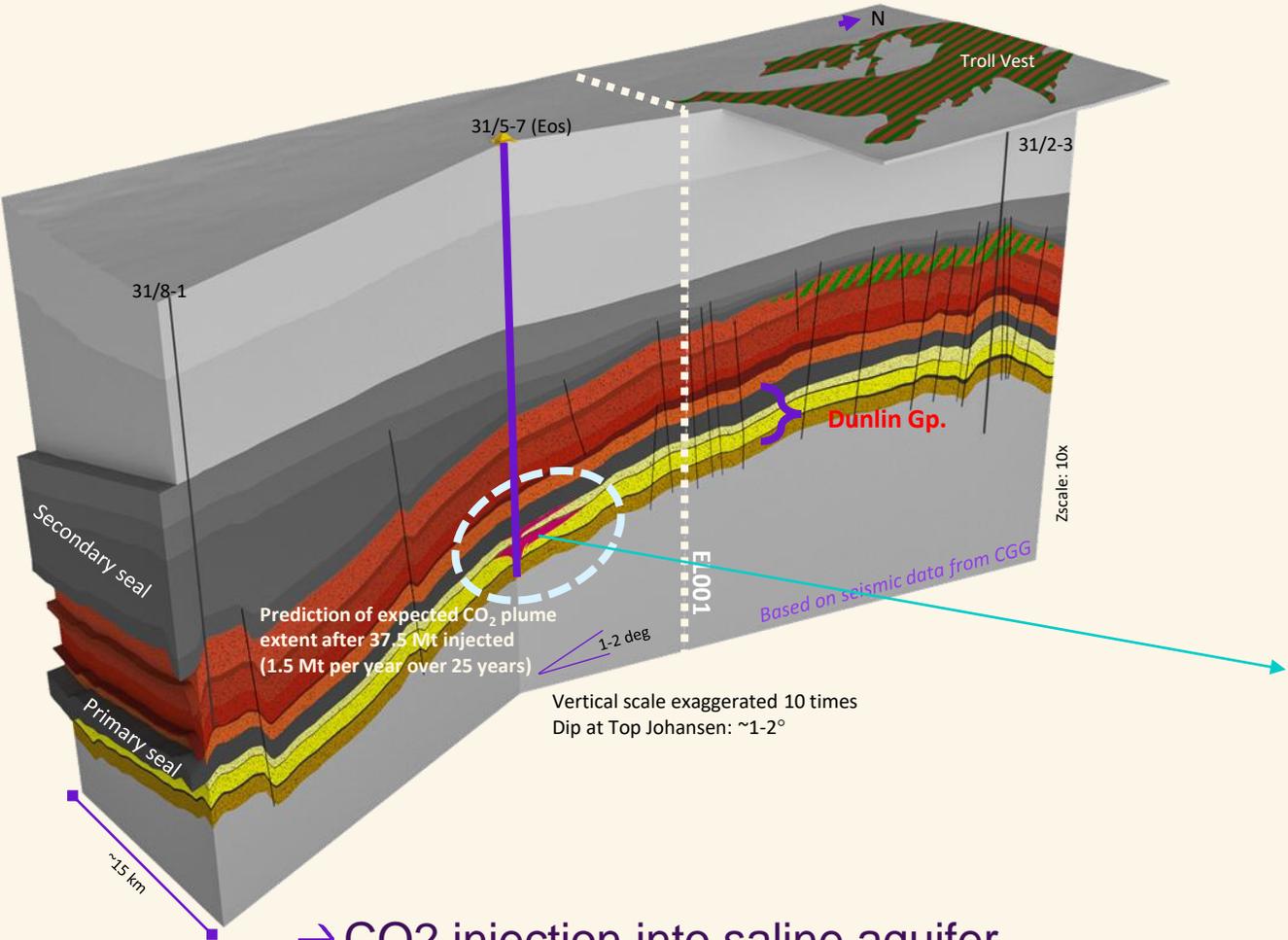
CCS in Norway

25 years of successful industrial experience



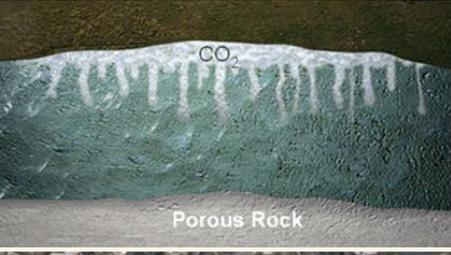
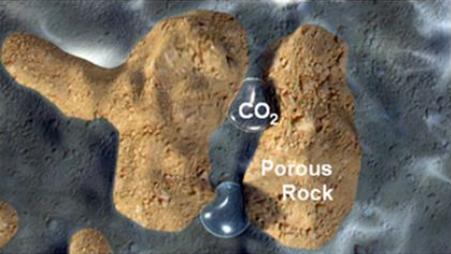
→ Ca. 25 mill tons of CO₂ safely stored

CO2 storage concept



→ CO₂ injection into saline aquifer sandstones

→ The longer the CO₂ stays, the safer it is!



http://www.co2captureproject.org/co2_trapping.html

Onshore facilities

- Initially 1.5 MT/year of liquid CO₂
- Purposely built for CO₂ handling
- Remotely controlled in normal operations
- Possibility to extend to future phases



Subsea facilities

- Single satellite structure on injection well installed in 2019, well drilled in 2020
- 100 km pipeline
- Fluid umbilical, power and signals from Oseberg Platform 36 km from well
- Connections for future extension to additional wells



Ship transportation

- 2 new build vessels in phase 1
- Largest CO₂ carriers in the world (7,500m³ capacity)
- A “standard” ship design
- High focus on CO₂ intensity & energy efficient
- One ship could handle ~400-450 ktpa from North French coast to Norway



Northern Lights JV

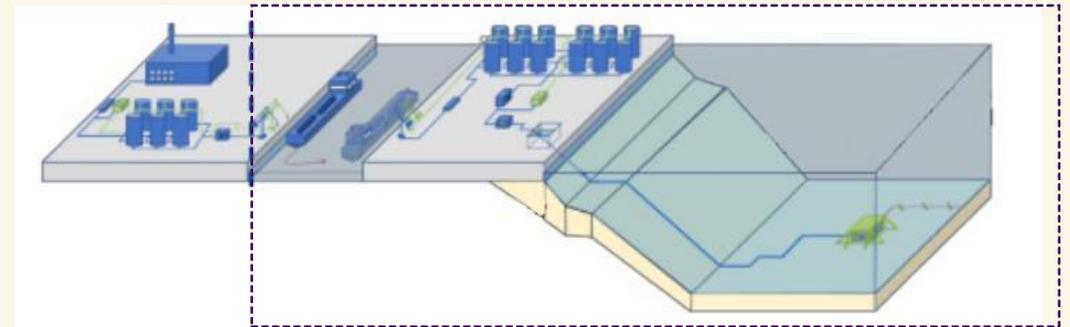
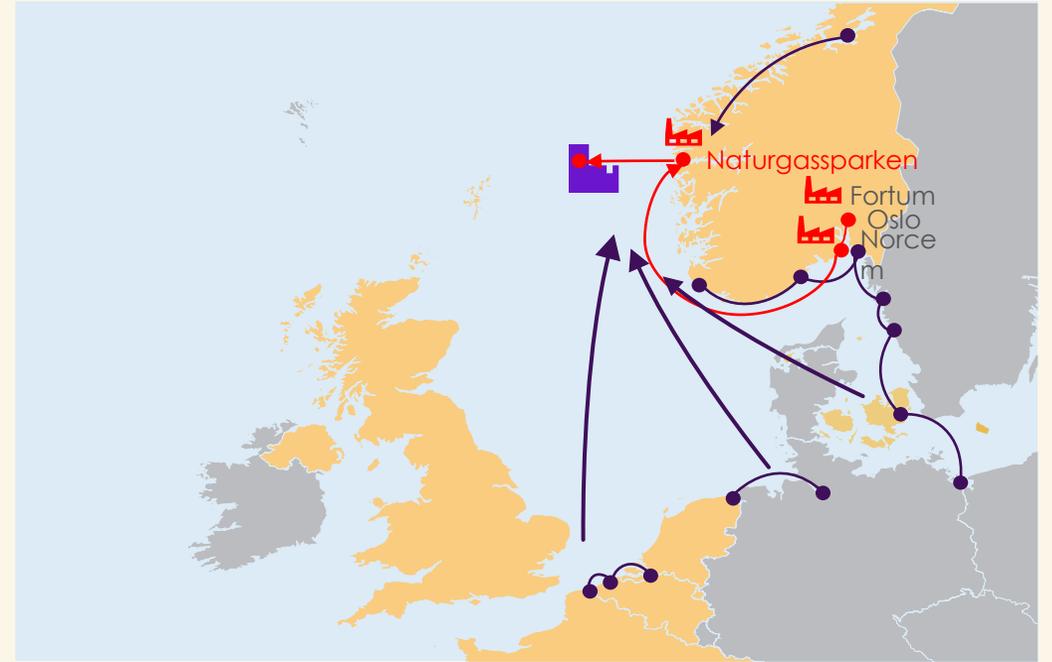
- Incorporated in March 2021
- Asset owner & operator of the facilities
- Will deliver CO₂ transportation and storage as a service across Northern Europe
- Start of operations by 2024

Northern Lights launches company dedicated to CO₂ transport and storage

March 9, 2021



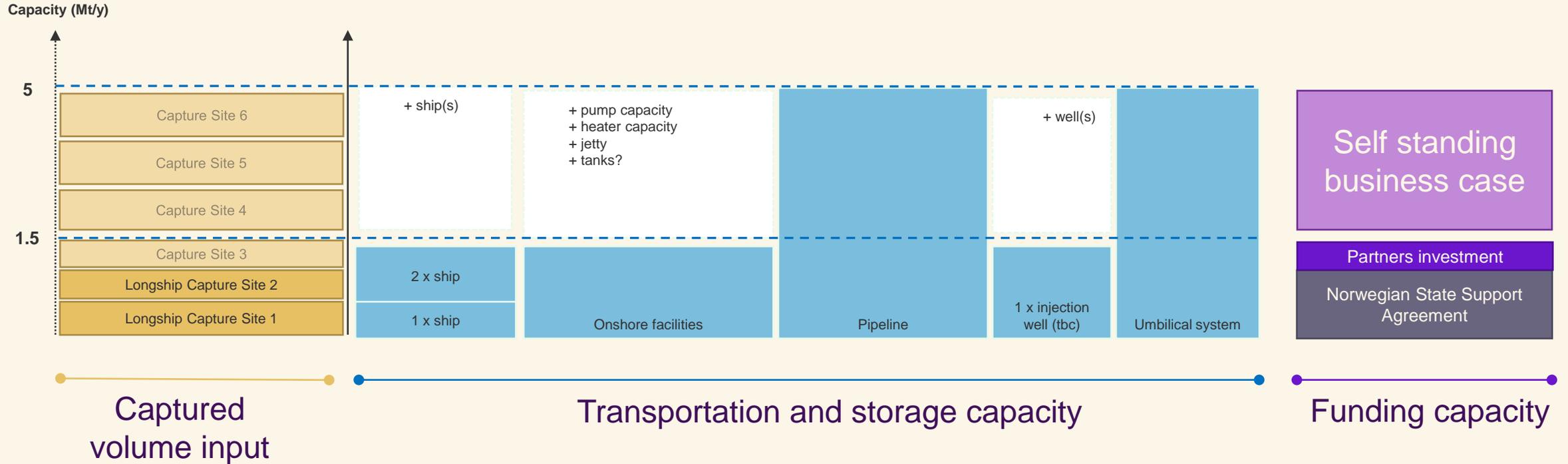
Børre Jacobsen, Managing Director



Northern Lights perimeter

Northern light business case

Scale up to profitable size



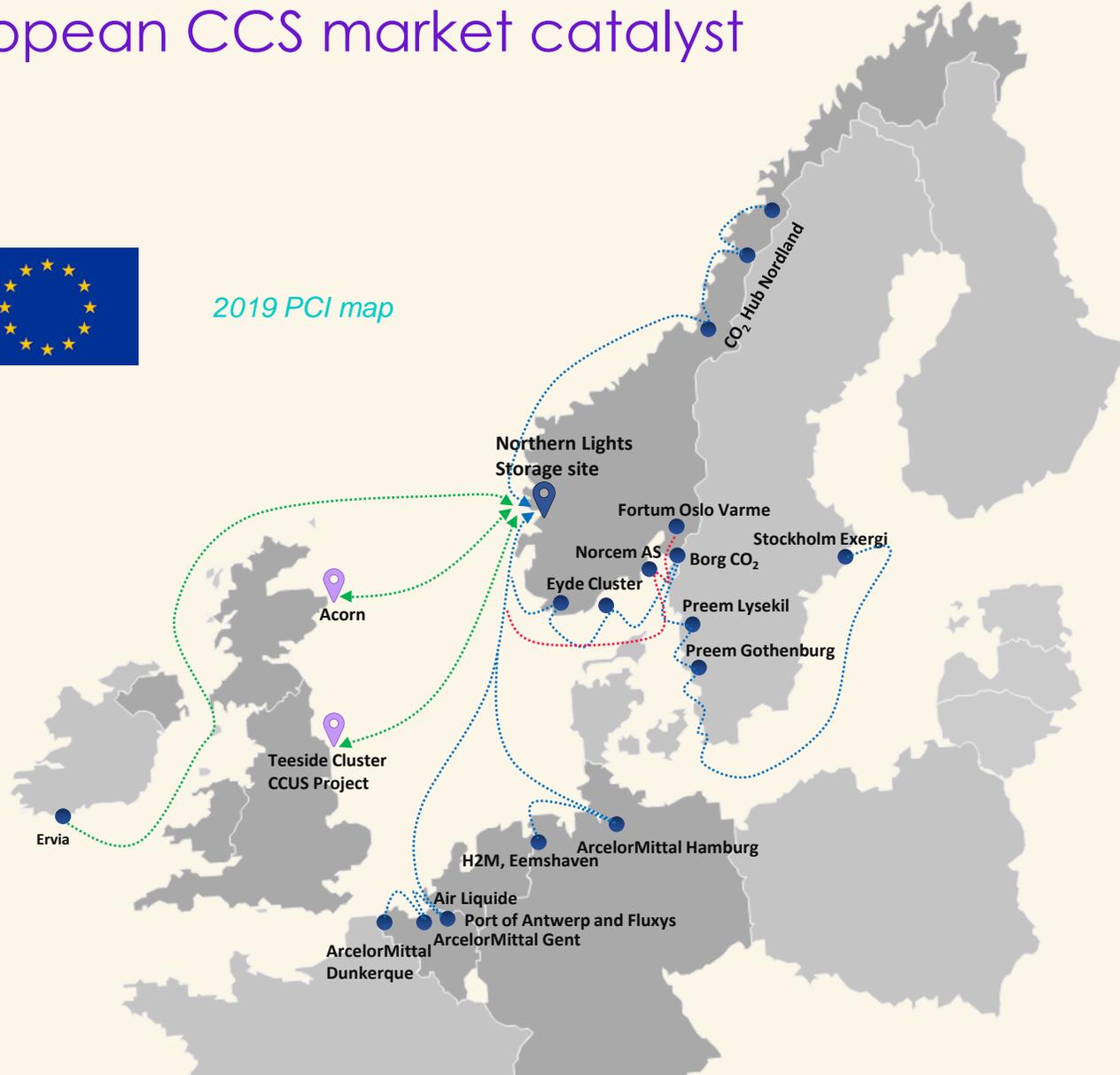
→ Demand and funding capabilities will bring the 5 MTPA forward in time

The Project of Common Interest

European CCS market catalyst



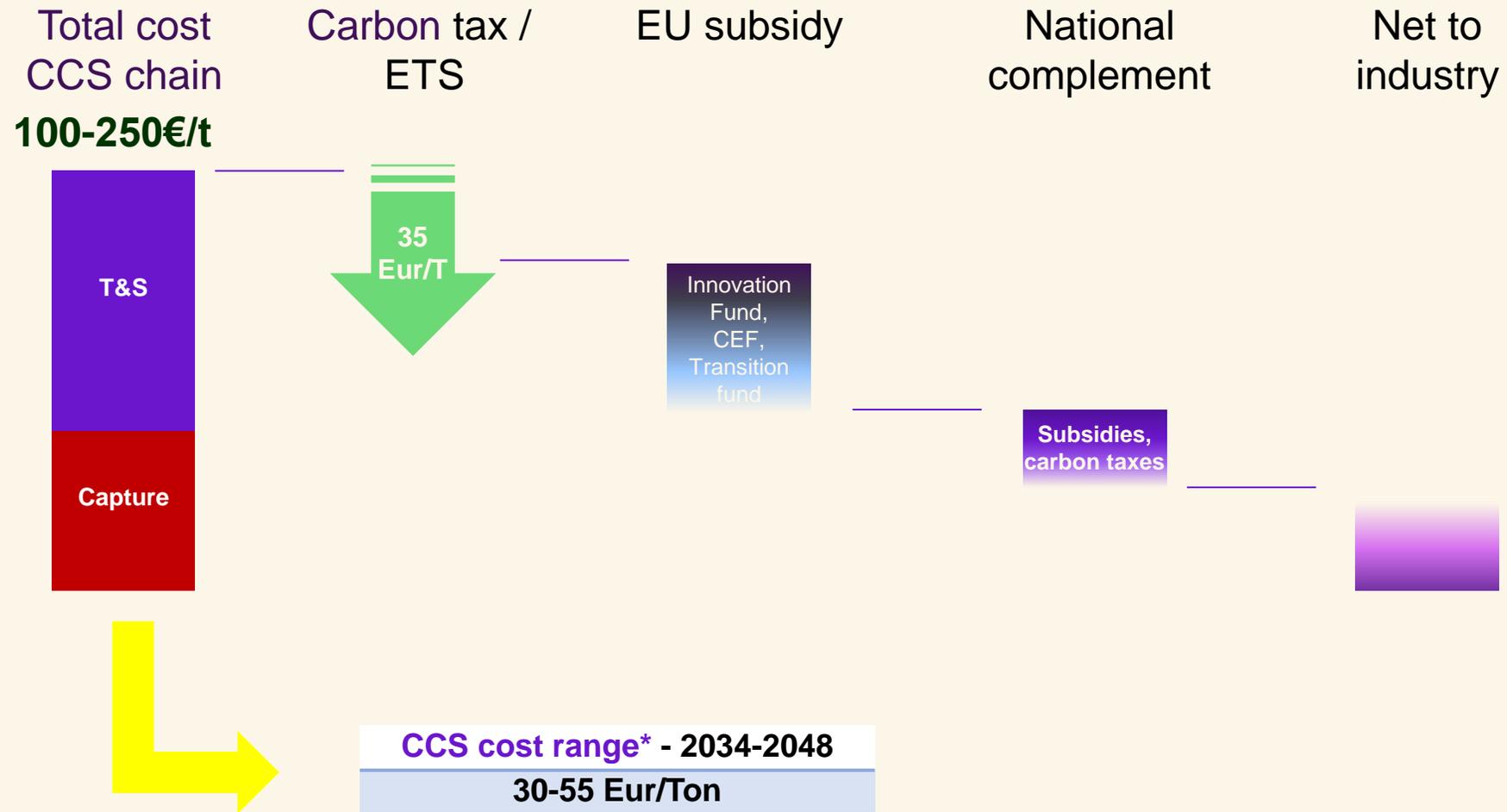
2019 PCI map



- Infrastructures projects that link the energy systems of EU countries
- Eligible to European **CEF grants**, accelerated permit and authorizations processes
- Increase visibility and credibility
- Stimulate **cost reductions** and **innovation**

Northern Lights PCI Update in 2021
with new countries and new entrants
→ France will be strengthened

Leverage to sustain CO2 value chain



European regulatory framework

Providing basic principles



- **Storage Regulation under Norwegian jurisdiction authorized 3rd party access**
- **CCS European Directive (2009) – a legal framework for a safe storage**
 - Preventing risks of geological storage of Co₂
 - Process for storage permits, reservoir monitoring, liability and financial security requirement, transfer of responsibility to Member State
- **London Protocol – Basis of international environmental law for maritime transportation**
 - Norway, UK, The Netherlands and Belgium already signed the addendum
- **The ETS Directive – GHG emission regulation**
 - CO₂ captured, transported and stored will be considered as not emitted (Annex still to be modified)



**Northern
Lights**