

# Northern Lights

A European CO<sub>2</sub> transport and storage network

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Stavanger Næringsforening – Energiåret 2020

Per Gunnar Stavland, Equinor

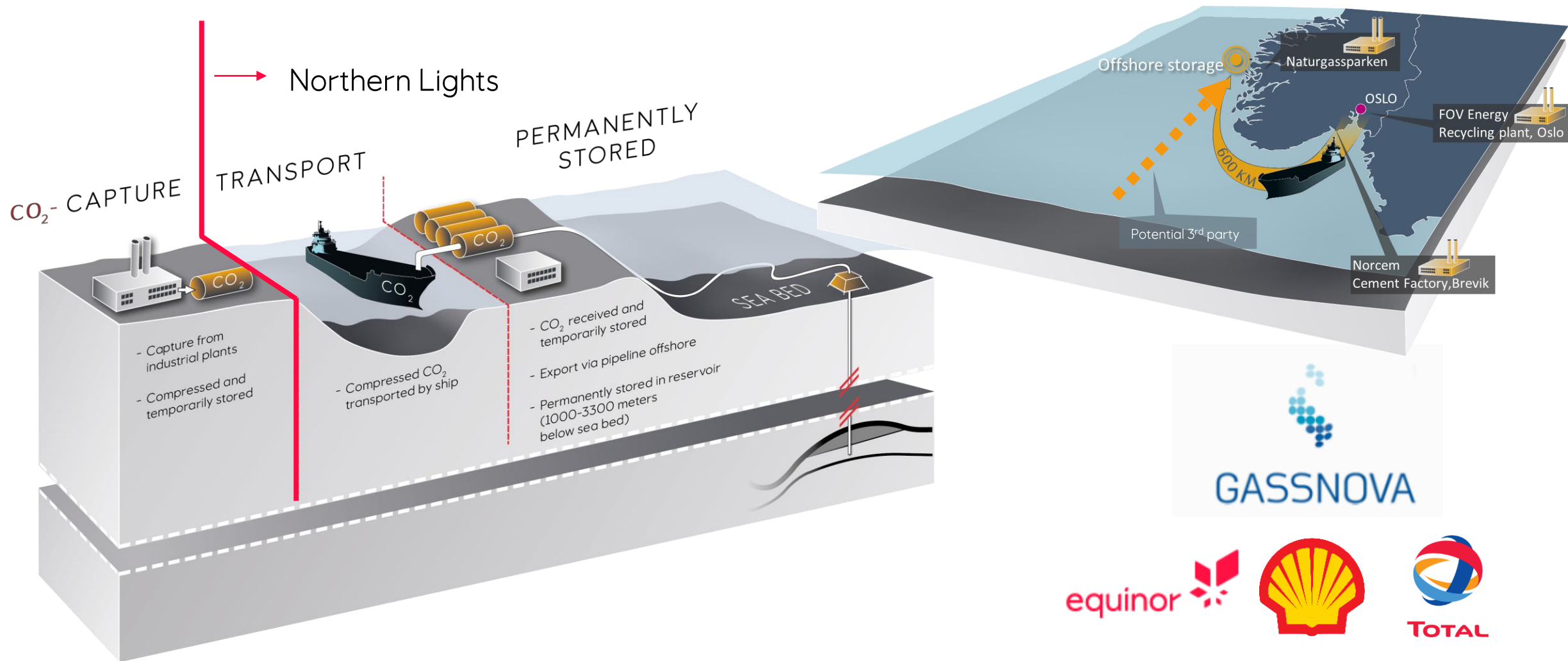
[pegust@equinor.com](mailto:pegust@equinor.com), +4790227089

<https://northernlightscs.eu/>

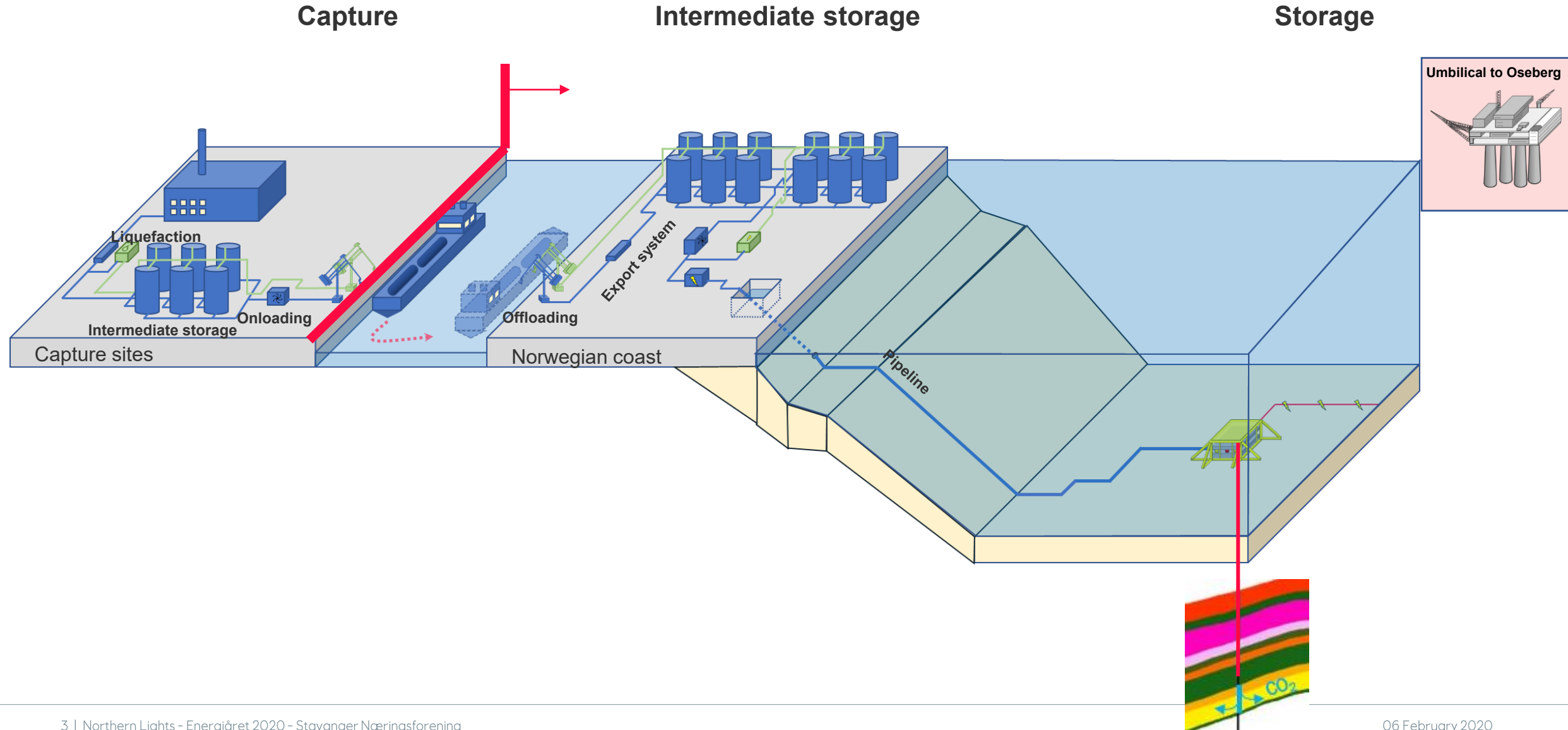


**TOTAL**

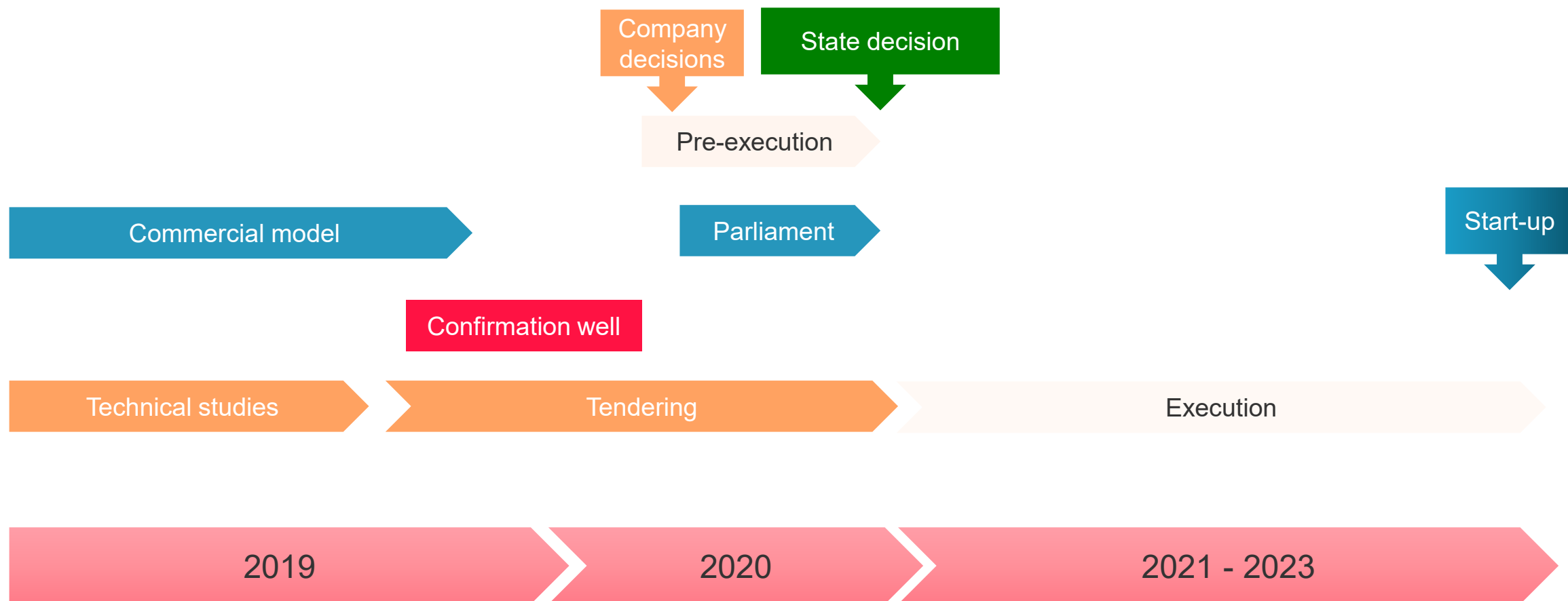
# Northern Lights – transport, injection and permanent storage of CO<sub>2</sub>



# Northern Lights concept

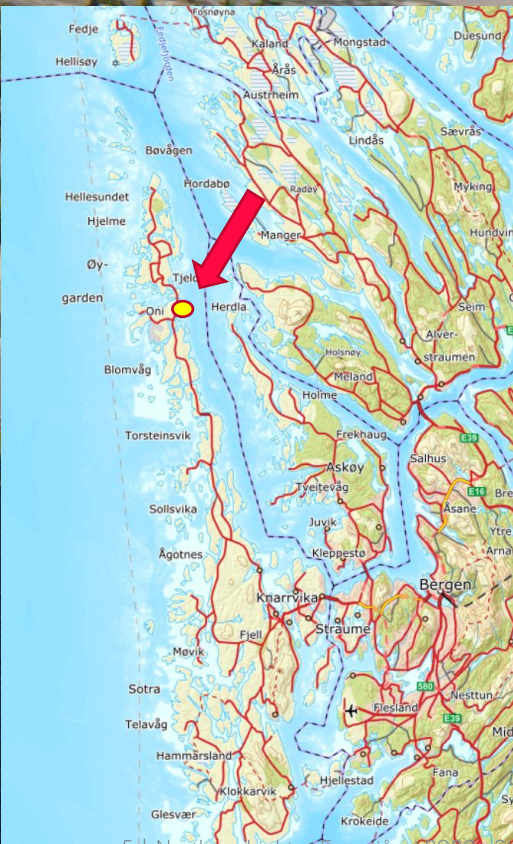


# Timeline for Northern Lights phase 1



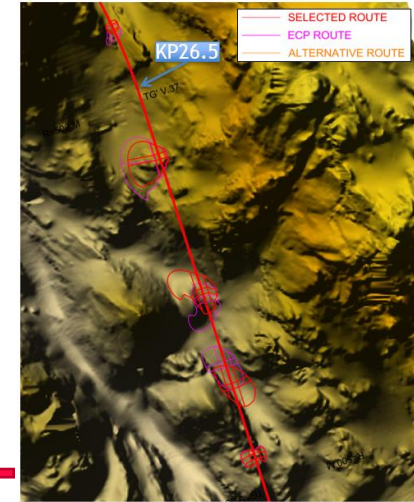
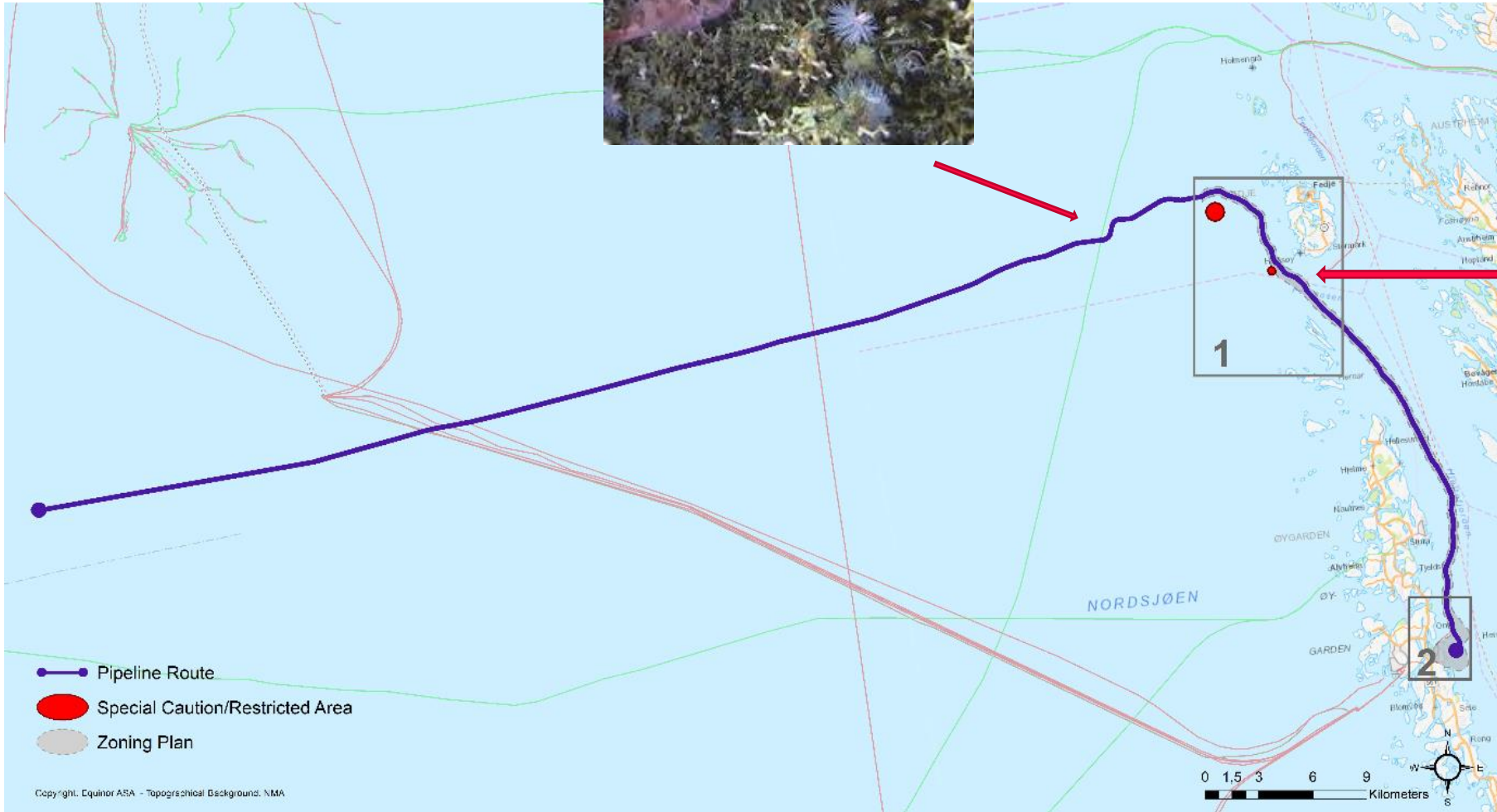
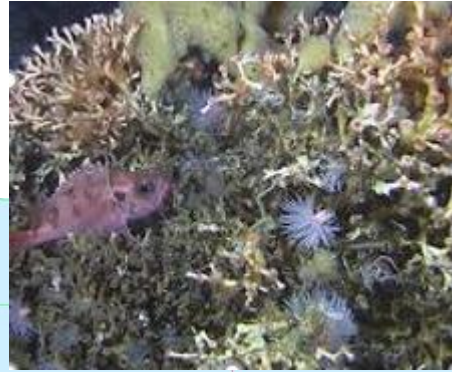


# Northern Lights onshore facility Øygarden

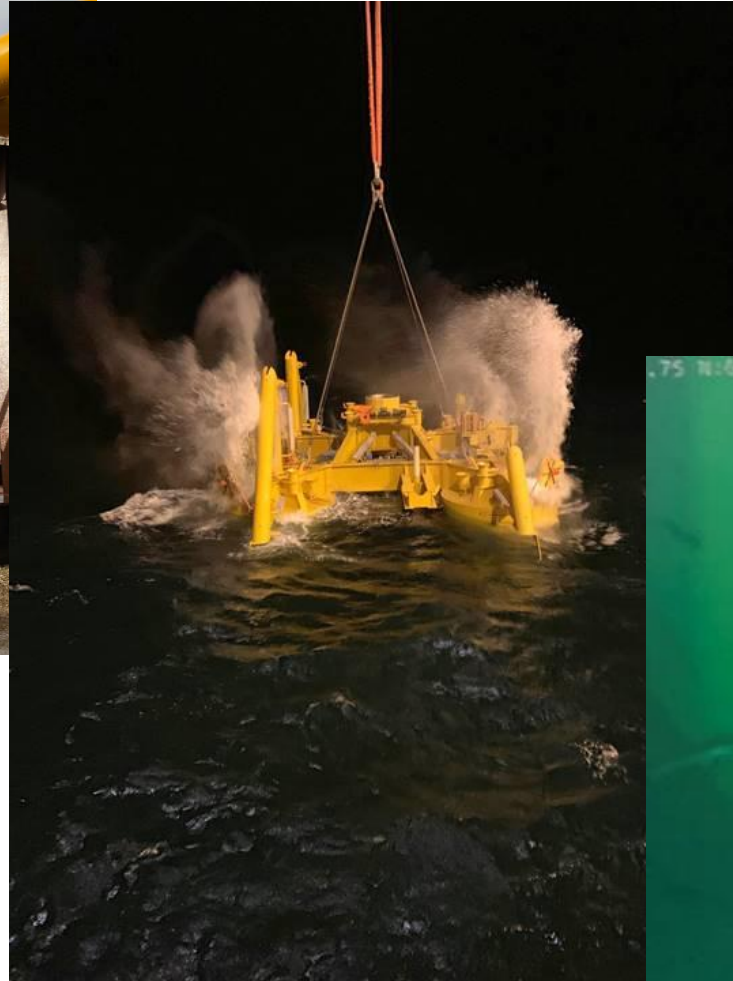




# Pipeline route



# Integrated Satellite Structure (ISS) already installed (Oct. 2019)

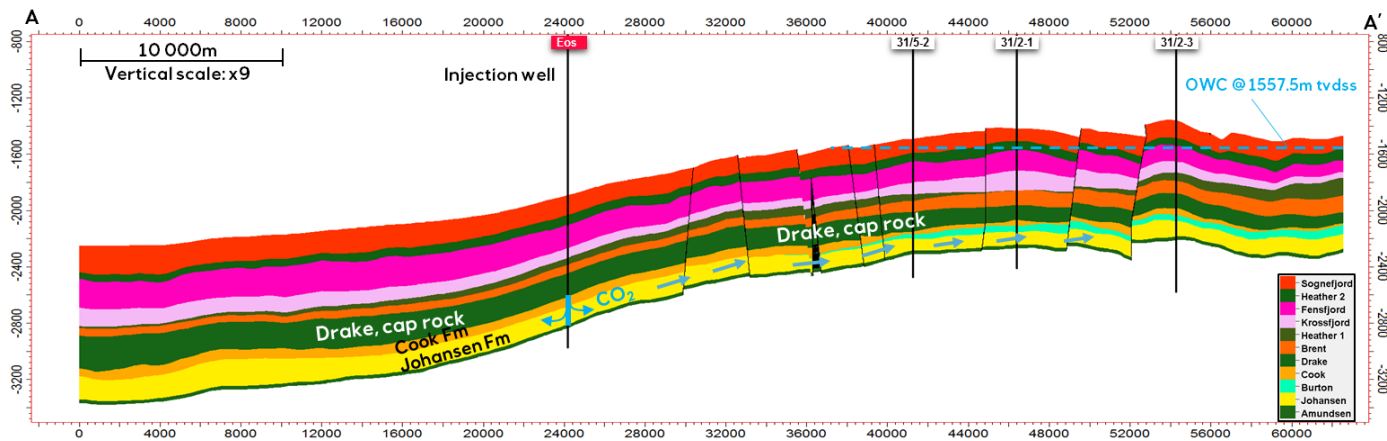




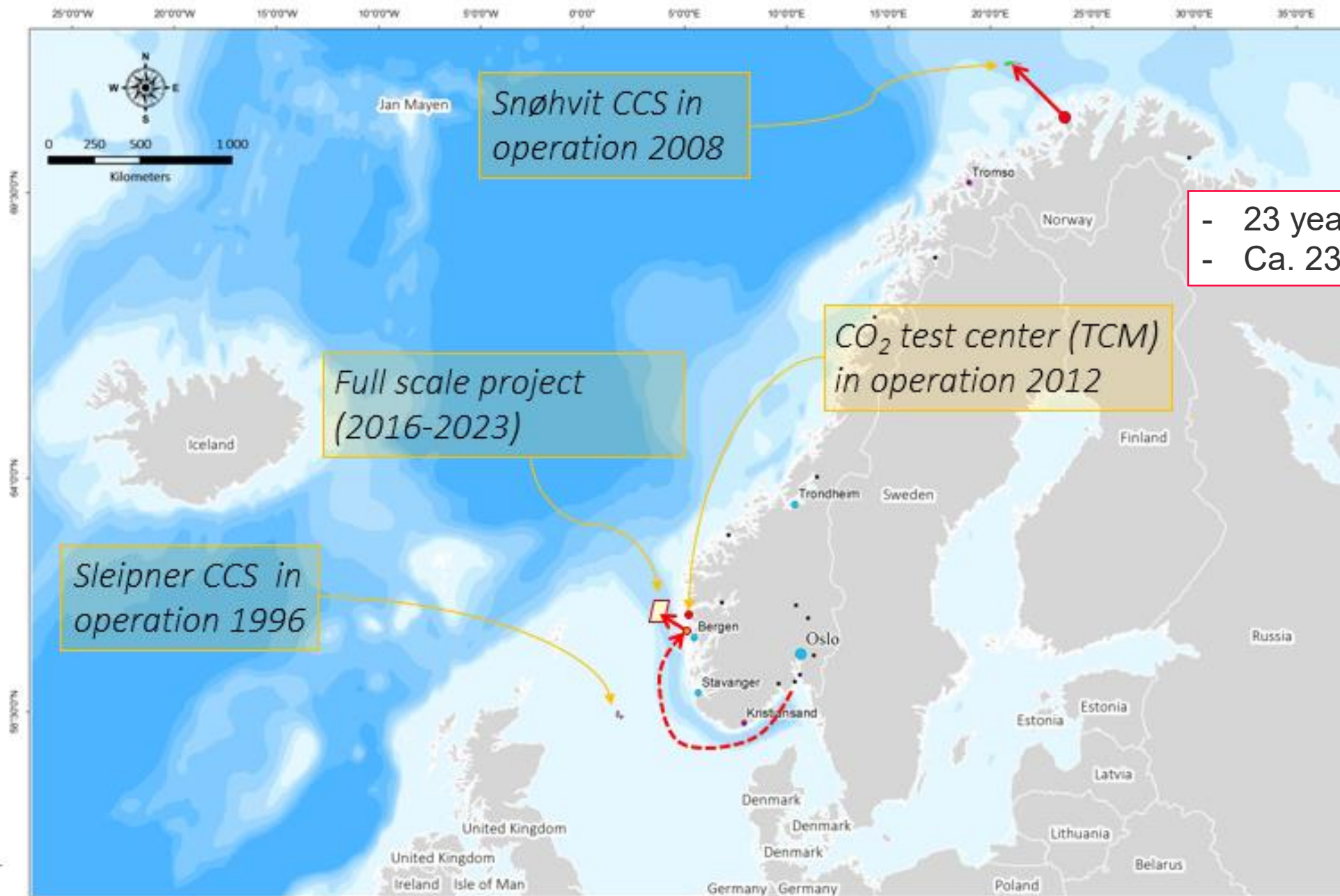
# Northern Lights Eos 31/5-7 – confirmation well

Well objectives:

- Confirm presence of the Johansen and Cook sandstone formations
- Confirm sealing potential of Drake Fm
- Confirm ability to inject CO<sub>2</sub> into the Johansen sandstone
- Keeper well – CO<sub>2</sub> injector

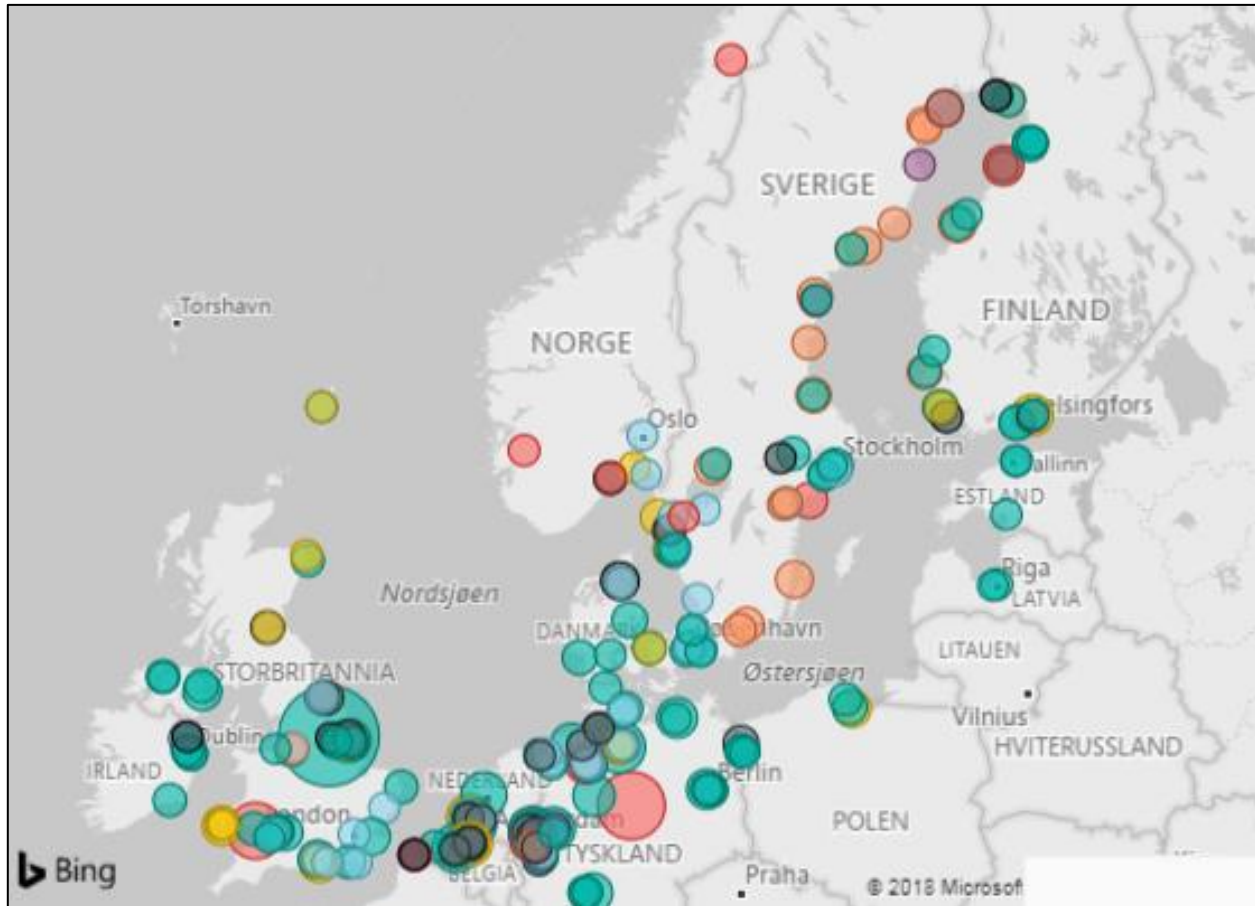






- 23 years of experience
- Ca. 23 mill tons of CO<sub>2</sub> stored

# Enables “open source” offer for CO<sub>2</sub> emitters to establish capture

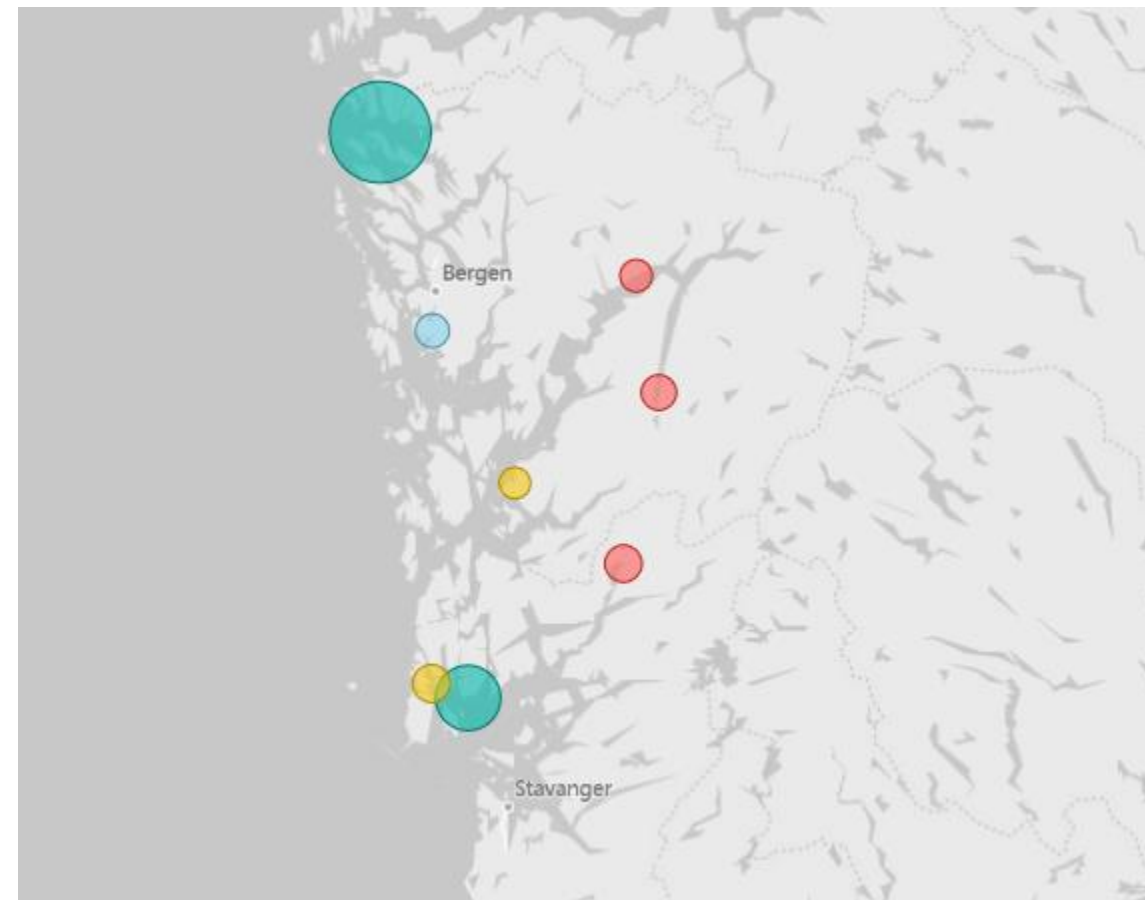


Large potential with long-life sectors:

- Hydrogen and power from natural gas
  - Waste incineration
  - Cement
  - Biomass and biofuel
  - Steel
  - Refinery
- *Northern Lights is relevant and within reach for about 350 facilities and 300 MTPA of these “most attractive candidates”*

## CO<sub>2</sub> Emission map Rogaland / Vestland

Facility name	Industry	Tons of CO <sub>2</sub> per year
Mongstad	Refinery	2.360.000
Elkem Bjølfefossen	Iron and steel	174.000
BIR Avfallsenergi	Waste incineration	216.000
Tizir Titanium and Iron	Iron and steel	261.000
Sør-Norge Aluminium	Aluminum	142.000
Eramet Sauda	Iron and steel	320.000
Hydro Karmøy	Aluminum	336.000
Gassco Kårstø	Oil and gas	1.210.000





# Northern Lights – a catalyst to a European network for CO<sub>2</sub> removal

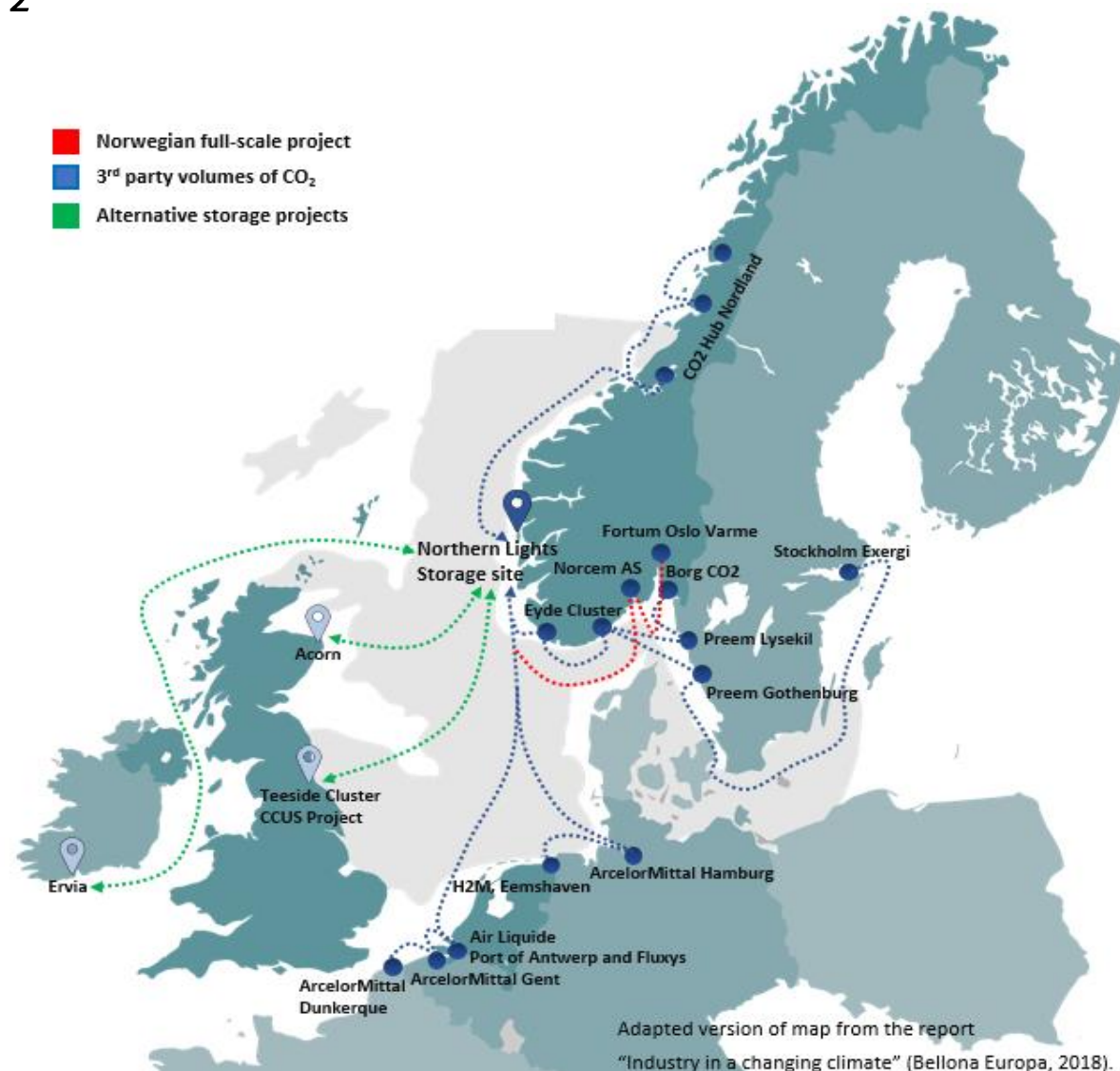
EU PCI application submitted

PCI is Project of Common Interest

15 partners from 7 countries

Included on fourth PCI list by EU Commission,  
October '19, together with 4 other CCS projects:

- Norwegian full-scale project
- 3<sup>rd</sup> party volumes of CO<sub>2</sub>
- Alternative storage projects



Adapted version of map from the report  
"Industry in a changing climate" (Bellona Europa, 2018).

# Seven MoUs signed at CCS Conference 05.09.19

## Companies

- Fortum Group; Finland
- Ervia, Ireland
- Air Liquide, Belgium
- Stockholm Exergi, Sweden
- ArcelorMittal, Luxembourg
- Preem, Sweden
- Heidelberg Group, Germany

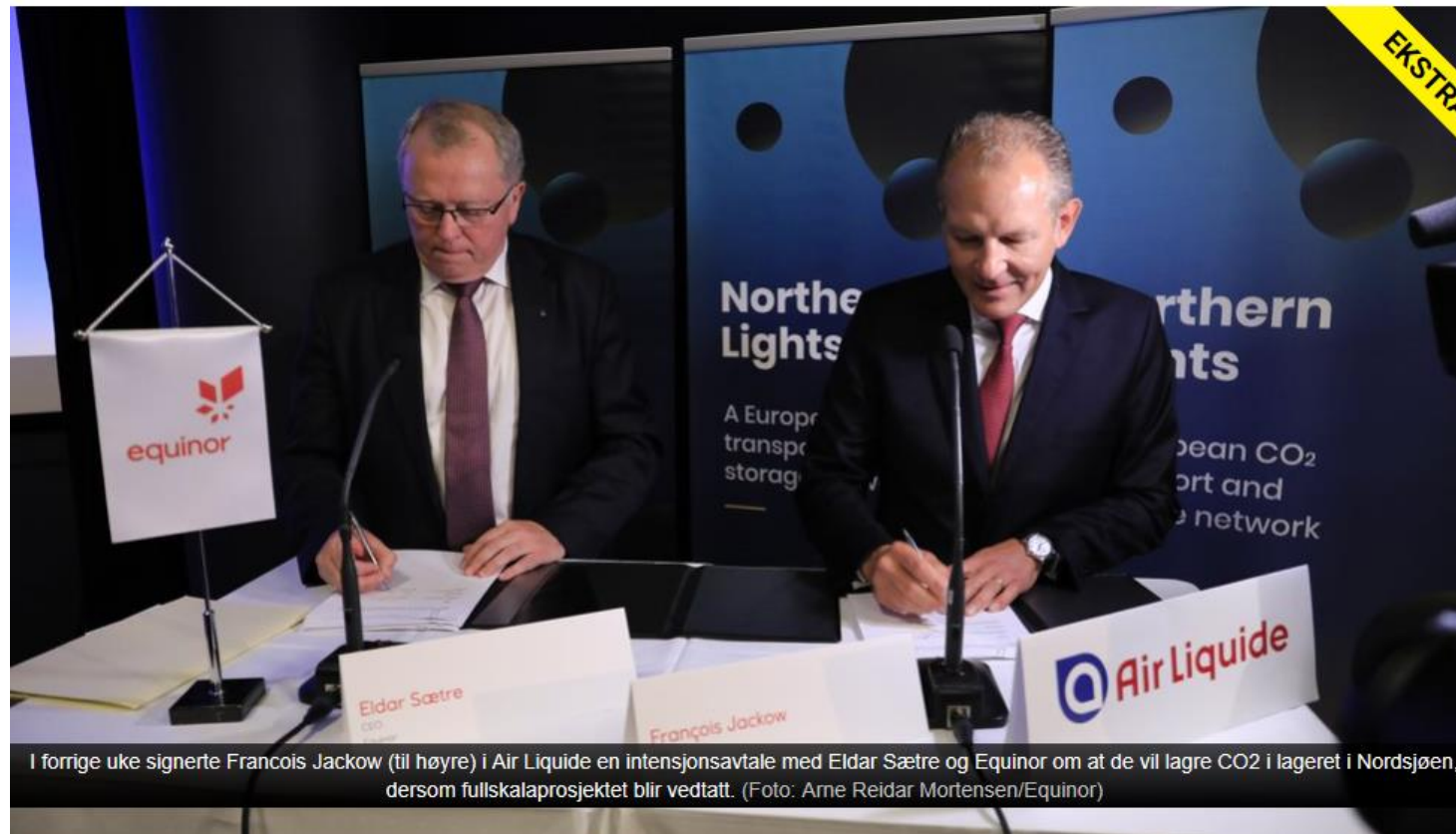
## Typical content

- Logistics studies
- CO<sub>2</sub> specifications optimized across value chain
- Roadmap towards potential start of operations
- Joint advocacy for CCS and its importance for decarbonization of European industry
- Initiate dialogue with National and Norwegian Governments



# Air Liquide: – Vi kan bidra med flere millioner tonn CO<sub>2</sub> i året i et lager i Nordsjøen

Skal blant annet lage hydrogen fra naturgass – og fange CO<sub>2</sub>-en.



I forrige uke signerte François Jackow (til høyre) i Air Liquide en intensjonsavtale med Eldar Sætre og Equinor om at de vil lagre CO<sub>2</sub> i lageret i Nordsjøen, dersom fullskalaprojektet blir vedtatt. (Foto: Arne Reidar Mortensen/Equinor)



# Questions?

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**Per Gunnar Stavland**

Authority Relations & Lead Safety and Sustainability – Northern Lights

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