

# Northern Lights CCS

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

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<https://northernlightscs.com>

# Northern Lights CCS

## – Interrelated and successive FIDs



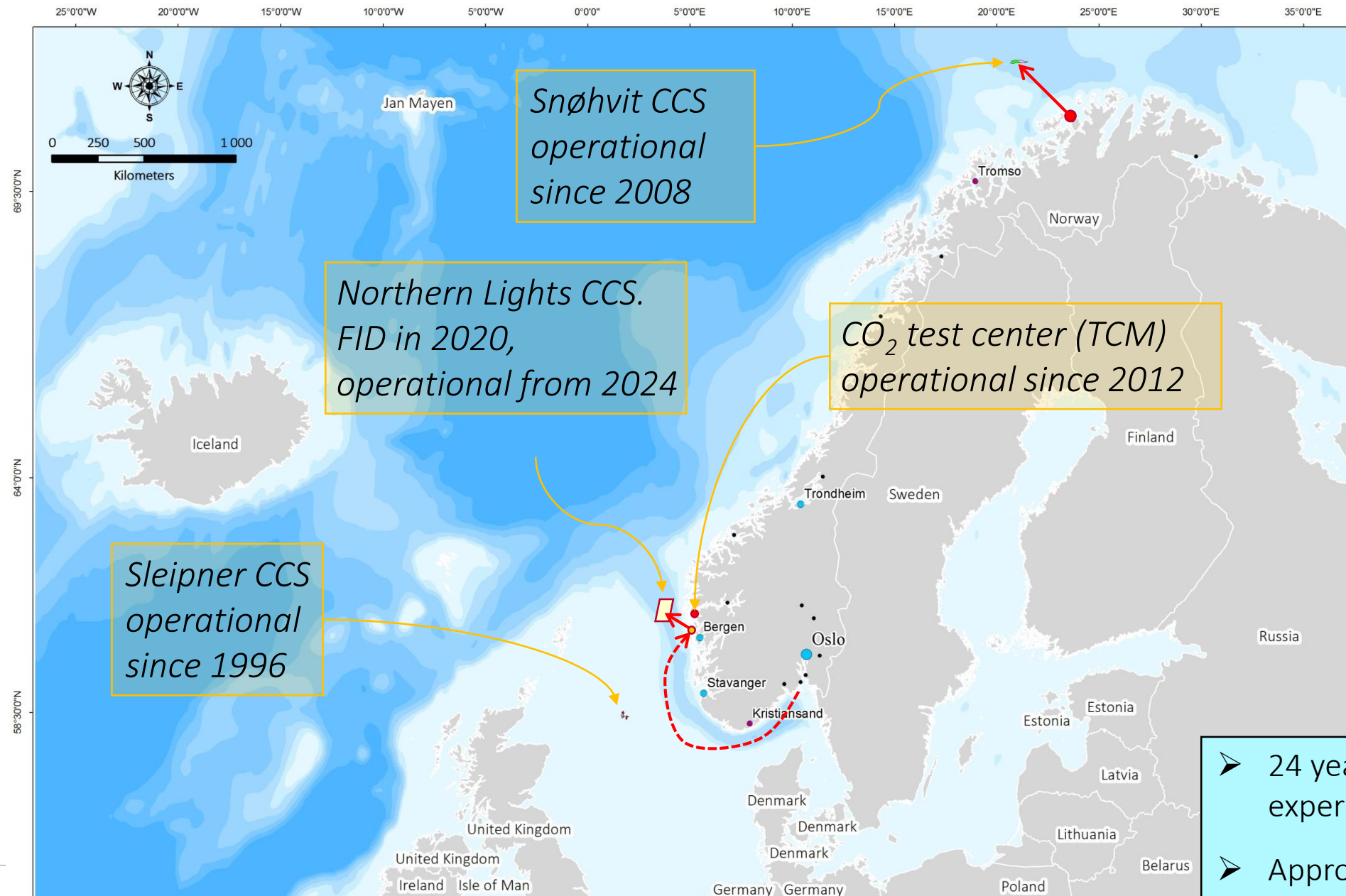
**15 May 2020:** NL CCS confirm our conditional FID



**21 September 2020:** The Norw. Gov't confirm their support

- October 2020: Government's budget proposal shared formally with Parliament and the public (ref. however the 21 Sept. announcement)
- December 2020: Formal approval of the state budget for 2021 ('State FID')
- 2024: Commencement of Operations

# CCS in Norway – 24 years of successful industrial experience



- 24 years of operational experience
- Approx. 24 mill tons CO<sub>2</sub> stored

# The energy transition – the role of CCS

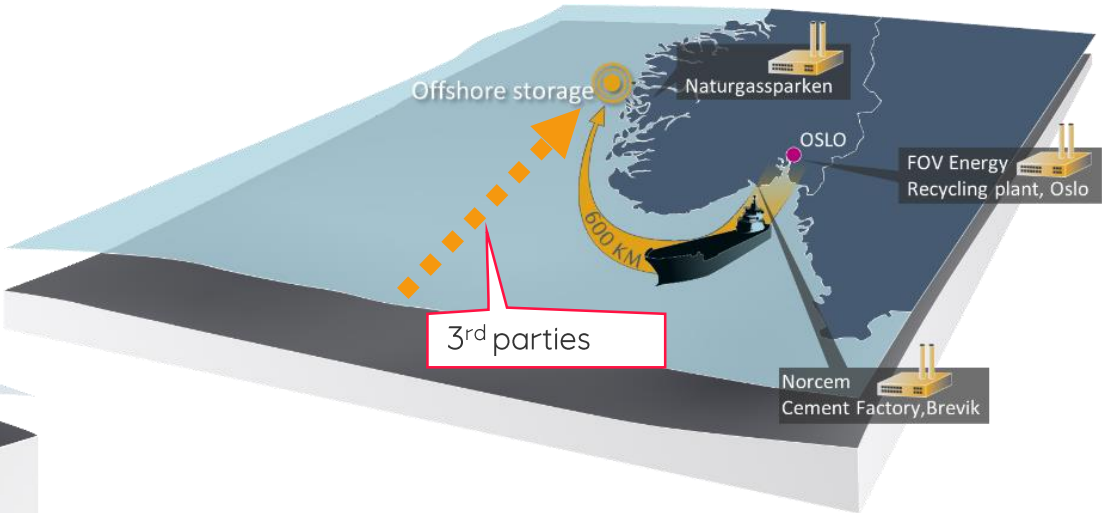
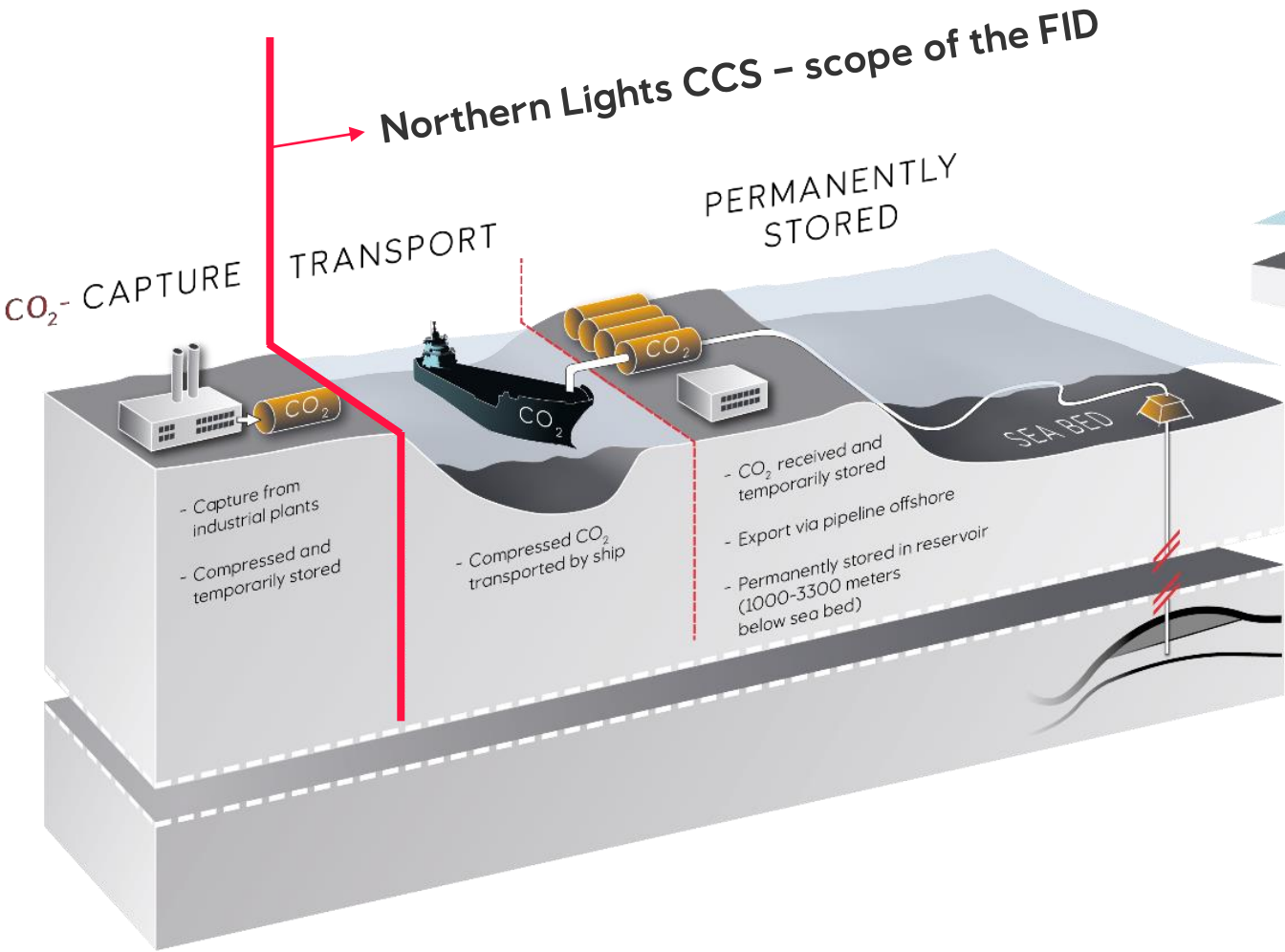
- Aggregate level: How do we de-carbonize the economy while at the same time maintaining industrial activities, value creation, jobs?
- Company level: What's our role? What will our shareholders want us to do? What return on investment do we need?



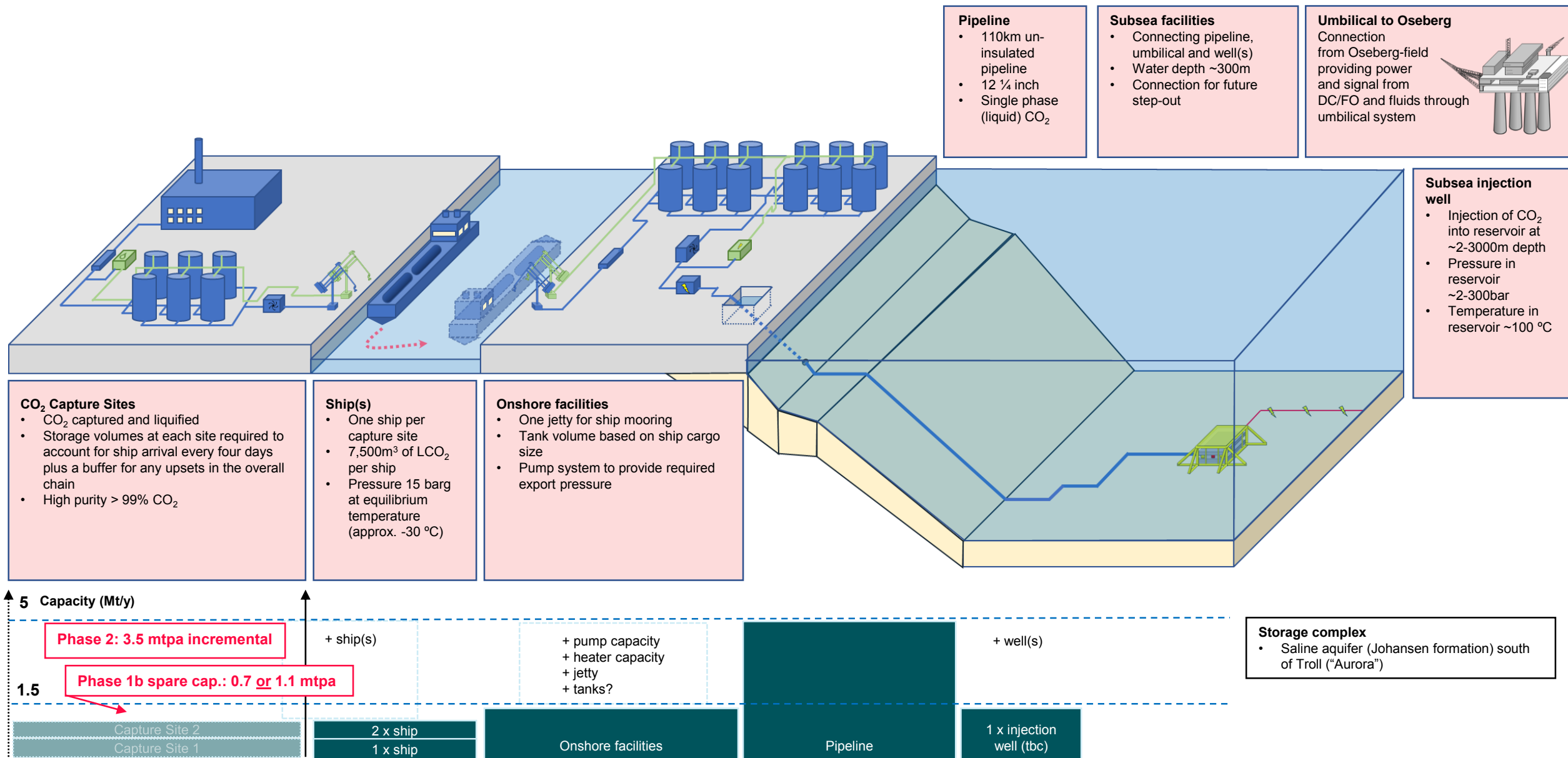
1. What will the ETS price do in the future?
2. Availability of subsidies?
3. Is there a market for decarbonized end products? (Steel, cement, power, etc.)



# The Norwegian full scale CCS demonstration project



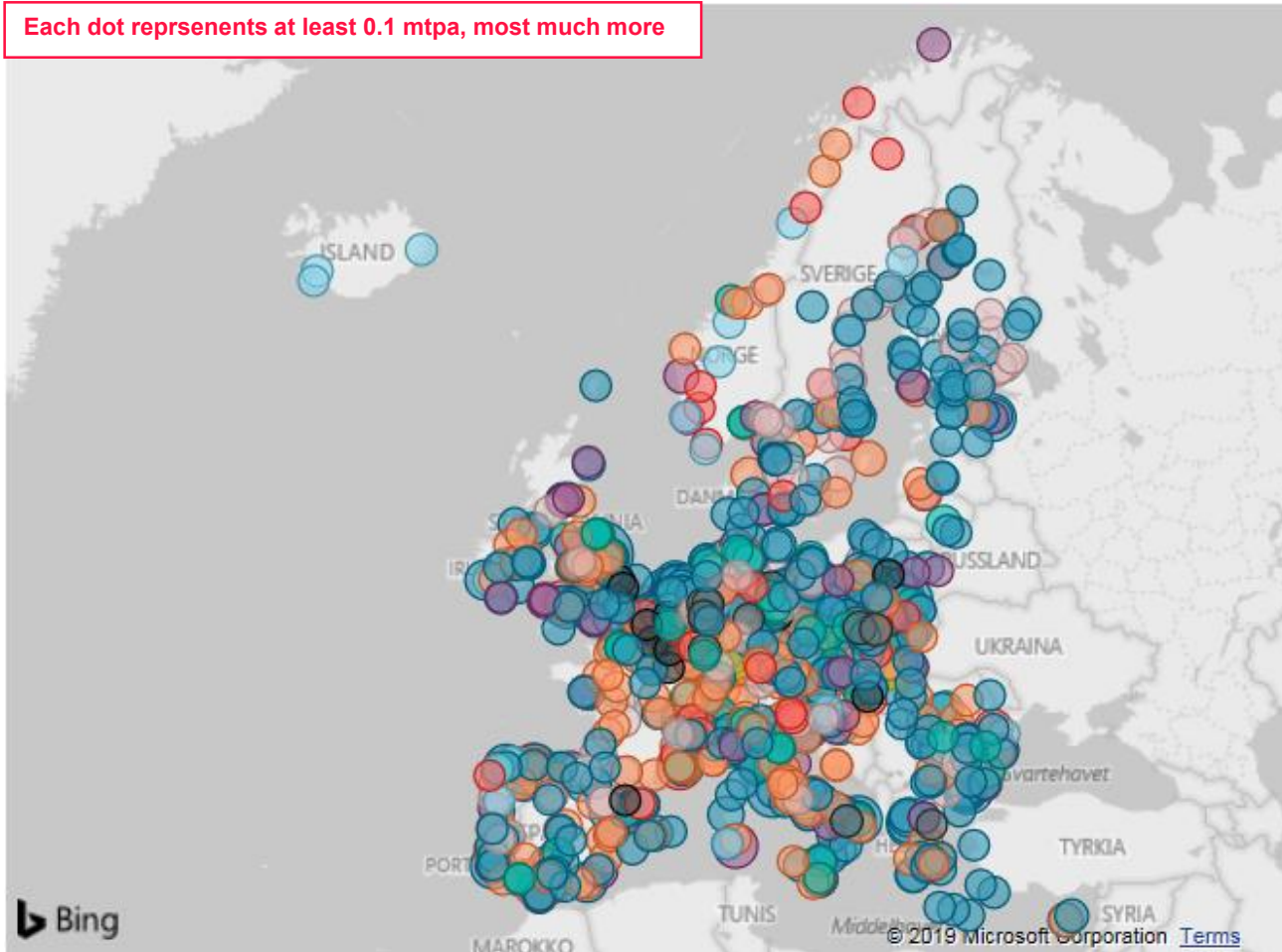
# Northern Lights CCS concept overview



# Is there a business opportunity?

- There is no lack of CO<sub>2</sub> in Europe
- The ship-based solution means access for CO<sub>2</sub> emitters across Europe

Each dot represents at least 0.1 mtpa, most much more



## Sectors with the largest potential

- Waste incineration / WtE
- Cement
- Biomass and biofuel
- Refineries
- Steel
- Natural gas
  - Hydrogen
  - Electricity
- Fertilizers
- Data centers
- DAC

# Is there a business opportunity?

- There is no lack of CO<sub>2</sub> in Europe
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## For the entire Europe map:

- Waste incineration – 261 facilities, 75 MTPA
- Cement and lime production – 277 facilities, 141 MTPA
- Biomass/fuel (pulp and paper) – 121 facilities, 73 MTPA
- Refineries – 94 facilities, 130 MTPA
- Steel and iron – 70 facilities, 134 MTPA
- Hydrogen – 10 facilities, 3 MTPA
- Natural gas – Very hard to estimate, as this is part of the “Heat and Electricity”, which is a combination of several fuel sources (coal, gas etc). Total for Heat and Electricity is: 753 facilities, 962 MTPA

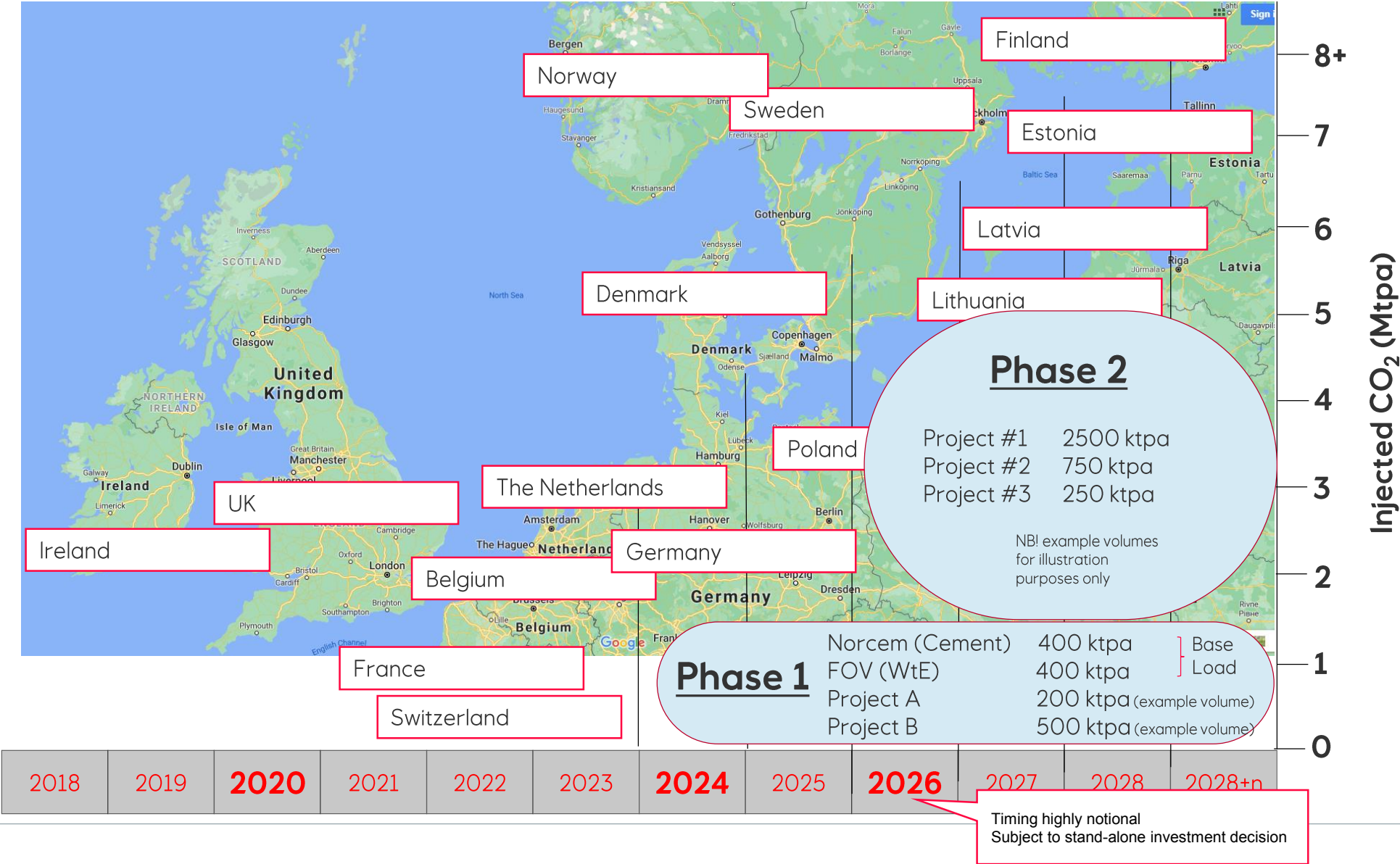
Grand total: Approx. 1 500 MTPA

## For Northern Lights CCS (Direct distance to Naturgassparken less than 1500 km, closest port within 25 km):

- Waste incineration – 108 facilities, 40 MTPA
- Cement and lime production – 40 facilities, 24 MTPA
- Biomass/fuel (pulp and paper) – 55 facilities, 40 MTPA
- Refineries – 45 facilities, 65 MTPA
- Steel and iron – 30 facilities, 75 MTPA
- Hydrogen – 4 facilities, 2 MTPA
- Natural gas – Very hard to estimate, as this is part of the “Heat and Electricity”, which is a combination of several fuel sources (coal, gas etc). Total for Heat and Electricity is: 253 facilities, 335 MTPA

Grand total: Approx. 580 MTPA

We are active in virtually all Northern European countries, and a few more...



# Eight MoUs signed

## COMPANIES

1. Fortum Group; Finland
2. Ervia, Ireland
3. Air Liquide, Belgium/France
4. Stockholm Exergi, Sweden
5. ArcelorMittal, Luxembourg/Belgium
6. Preem, Sweden
7. Heidelberg Group, Germany

## ACADEMIC INSTITUTIONS

1. ETH Zurich, Switzerland

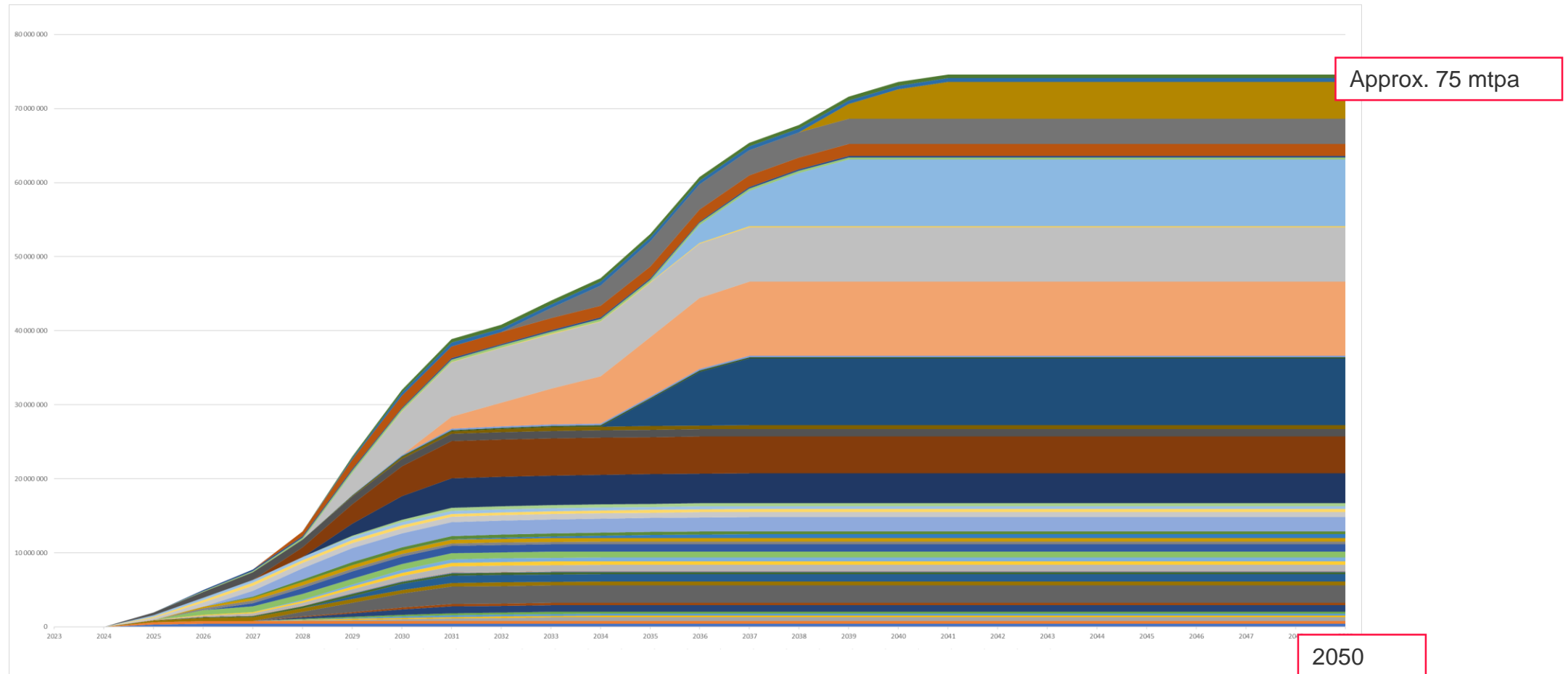
## TYPICAL CONTENT

- Logistics studies
- CO<sub>2</sub> specifications optimized across value chain
- Commercial maturation
- Joint advocacy for CCS and its importance for the successful decarbonization of European industry
- Initiate dialogue with National Government and dialogue with Norwegian government



# NW Europe based companies that NL CCS have a positive dialogue with, MoU-partners ++

- This profile will not be realized, but provides an impression of the scope/size of the prize
- The Innovation Fund: NL CCS anticipates, based on our conversations, that 10-15 emitters will apply for Innovation Fund support in the ongoing process



# Creation of a European CCS ecosystem and a virtuous circle

- Northern Lights CCS are being contacted by a number of companies that would like to play a role in the value chain
  - Capture
  - Transportation
  - Storage
  - Non-technical disciplines
- We believe this will stimulate
  - Innovation
  - Cost reductions
  - Jobs creation

**- A ship-based solution means access for CO<sub>2</sub> emitters across Europe**

