



# History and partnership construct



→ 2016: The idea of a full value chain CCS project in Norway was born. Norwegian Government played an active role

→ 2017: The formal co-operation with Equinor, Shell and TotalEnergies commenced

→ 2020: The Longship project was launched

→ 2021: Northern Lights JV DA was established

- NL JV is a Shared Liability (DA) company owned 1/3 each by Equinor, Shell and TotalEnergies
- Northern Lights JV DA is the operator of Norway's first CO<sub>2</sub> injection license (Aurora)



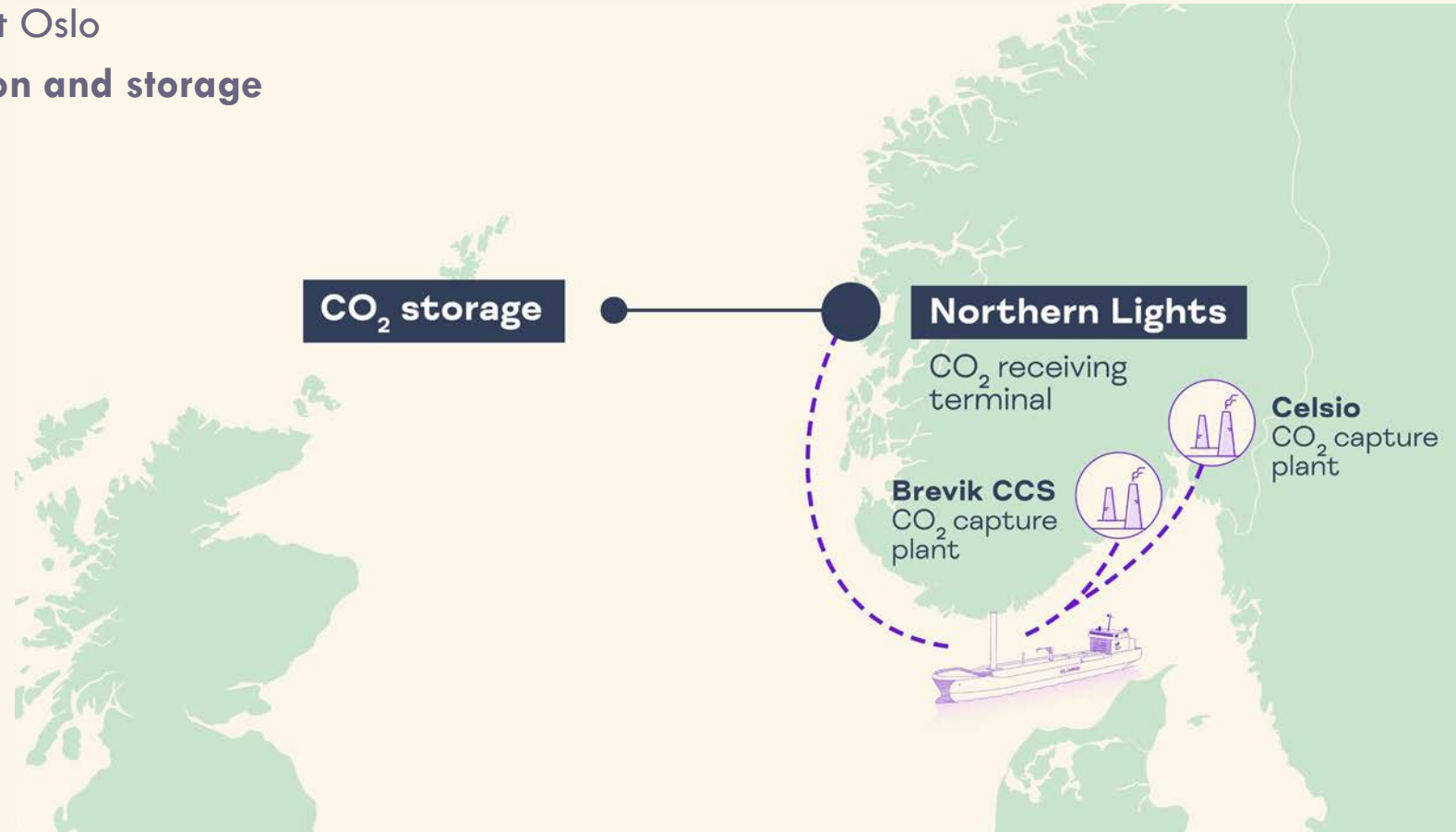
# The “Longship” Project



→ A demonstration of large-scale, end-to-end CCS value chain consisting of:

- Heidelberg **cement manufacturing** plant at Brevik
- Celsio **waste-to-energy** facility at Oslo
- Northern Lights **CO<sub>2</sub> transportation and storage**

→ Norwegian Government is co-financing Northern Lights Phase 1 with a capacity of 1.5 million tons of CO<sub>2</sub> per year



## LONGSHIP

### CO<sub>2</sub> capture

Capture from industrial plants.  
Liquefaction and temporary storage.



## NORTHERN LIGHTS SCOPE

### Transport

Liquid CO<sub>2</sub>  
transported by ship.



### Receiving terminal

Intermediate onshore storage.  
Pipeline transport to offshore  
storage location.



### Permanent storage

CO<sub>2</sub> is injected into a saline aquifer.

100 km

2 600 m



# Last year was a significant year for CCS:

- Our facilities reached 91% completion overall
  - Tested our two CO<sub>2</sub> injection wells
  - We will be ready for operations this year
  - On schedule and on cost!
- Signed two commercial agreements
  - Yara and Ørsted
  - Reached 4 customers
- Order two new CO<sub>2</sub> ships
  - Increasing our fleet to 4 CO<sub>2</sub> ships
  - World's largest dedicated CO<sub>2</sub> shipping fleet
- Awarded €131 mln EU funding towards Phase II expansion



Northern Lights is on schedule and on cost!



Pipelaying campaign  
started in 2023

Ready for operations in 2024

100 km pipeline to run  
from onshore terminal  
to offshore geological storage

Ålesund, Norway



Storage tanks

Future expansion

Workshop

Injection pumps

Pipeline tunnel

Admin/visitor centre

Jetty

## Onshore Facilities

Construction progressing on time and on budget

Ready for operations in 2024

# CO<sub>2</sub> Ships



- 4 ships on order
- World's largest dedicated liquified CO<sub>2</sub> ships
- Cargo capacity: 7,500 m<sup>3</sup>
- Length: 130m

- Medium pressure cargo containment
  - App. 15 bar(g) and -26°C
- LNG as fuel, wind assisted propulsion system and air lubrication will reduce carbon intensity by around 34% compared to conventional systems



CO<sub>2</sub> ships are on schedule for delivery in 2024



# First two CO<sub>2</sub> ships' custom-built cargo tanks are being installed in Q1 2024

Before



Cargo tank lifting



After



# Commercial contracts

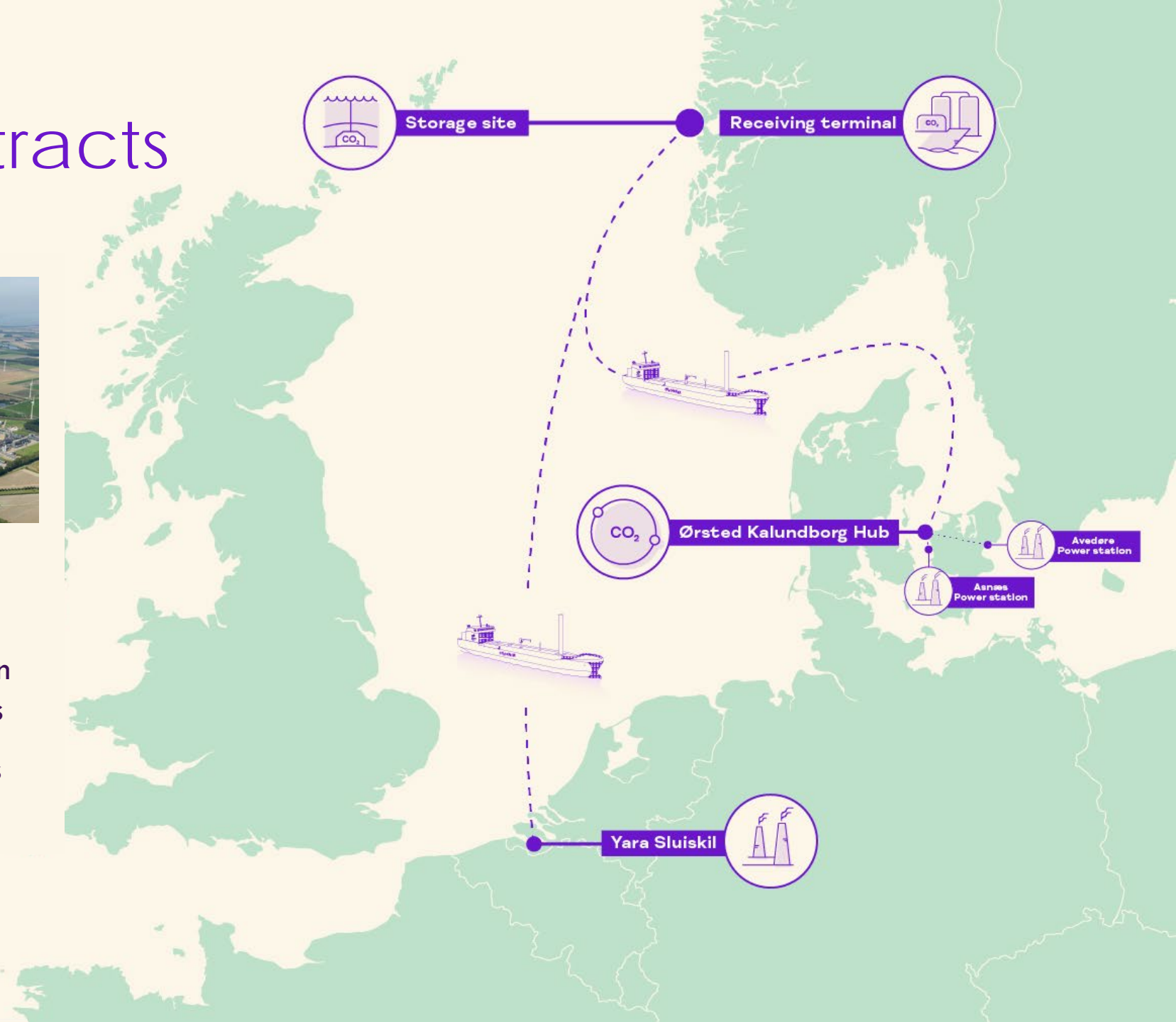


## Ørsted

- Bioenergy plants in Denmark
- 430,000 tonnes CO<sub>2</sub> annually

## Yara

- Ammonia and fertiliser plant in the Netherlands
- 800,000 tonnes CO<sub>2</sub> annually



# Phased development

## →Phase 1: under construction

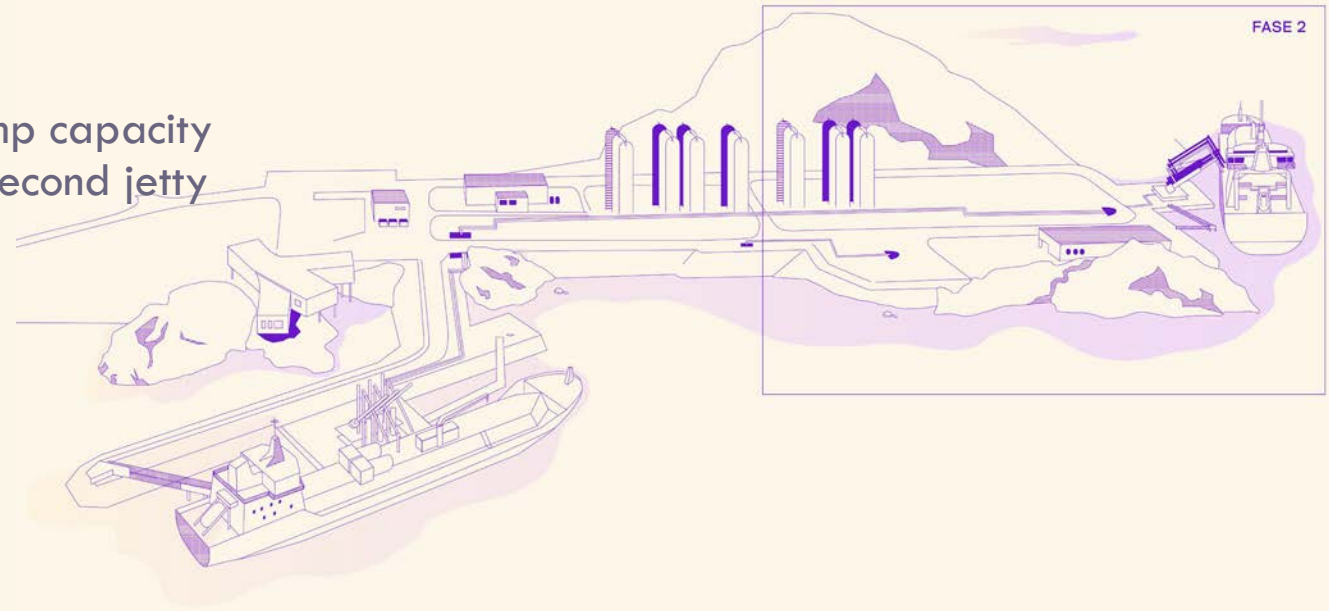
- 1.5 MTPA capacity, ready for operations in 2024
- 4 ships @ 7,500 m<sup>3</sup> and 2 wells (one back-up)
- Pre-investment in Phase 2 civil works and oversized pipeline
- Combination of commercial and Longship volumes

## →Phase 2 expansion: commercial development

- “Filling the pipeline”: 5-7 MTPA
- Additional ships, storage tanks, increased pump capacity and associated utilities, more offshore wells, second jetty

## →Growth

- Additional pore space
- Various concepts under consideration





# Northern Lights

[norlights.com](http://norlights.com)