



equinor

Smeaheia

Troll Vest

Troll Øst

Northern Lights

Stovegolvet

0 km 10

Equinor Carbon storage and transportation

US-Norway Bilateral Meet



Image Audun Groth

Shaping the European future of CCS and clean hydrogen

Competitive edge founded on experience, infrastructure and customers



15-30 MTPA

CO₂ transport and storage capacity by 2035

Equinor share

> 25%

CO₂ transport and storage market share in Europe by 2035

3-5 MAJOR INDUSTRIAL CLUSTERS

Clean hydrogen projects by 2035

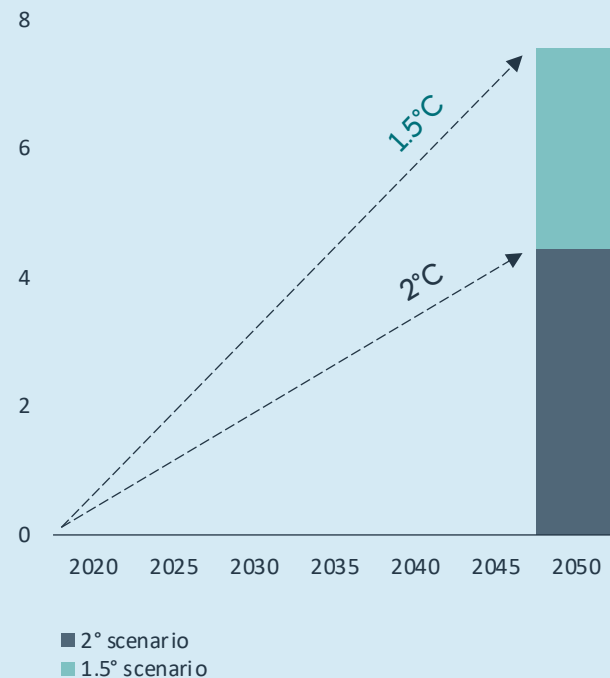
> 10%

Clean hydrogen market share in Europe by 2035

Net zero driving demand for CO₂ transport and storage

Global CCUS capacity outlook

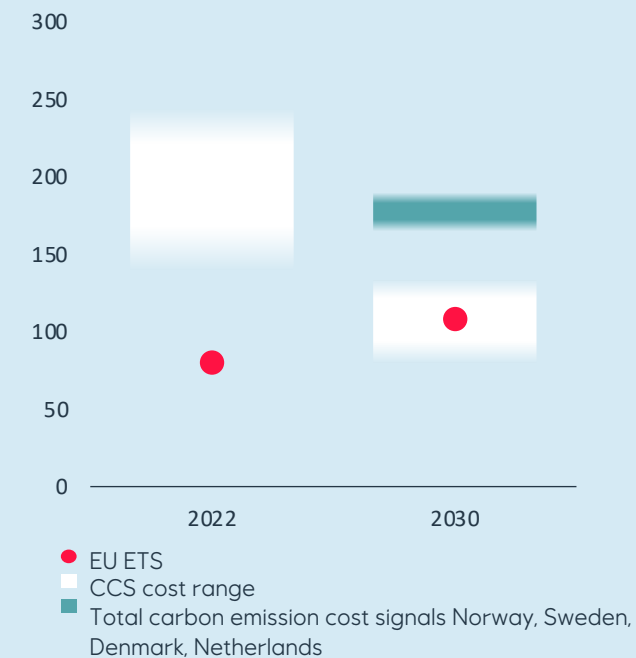
Giga tonnes per year



Source: Wood Mackenzie

CCS cost vs. carbon emission costs*

EUR per tonne

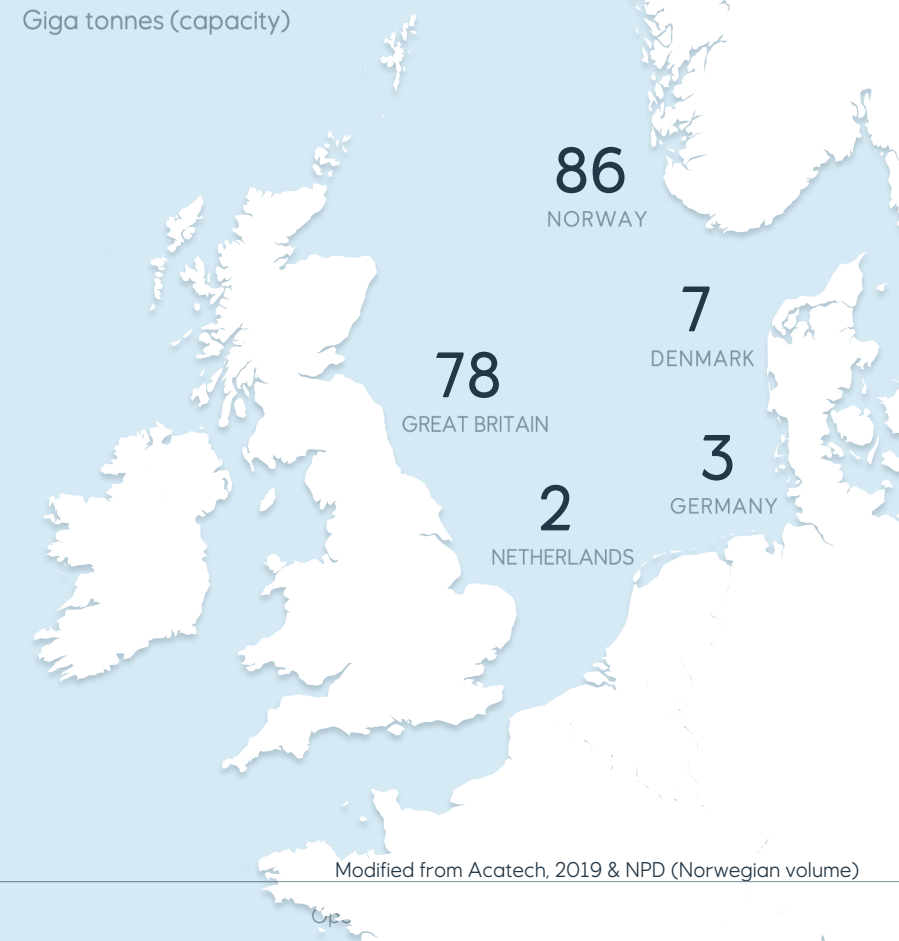


CCS cost: various sources including Equinor, Northern Lights and IEA.
EU ETS projections from Bloomberg NEF March 2021

CO₂ storage potential offshore

North Sea basins

Giga tonnes (capacity)



Modified from Acatech, 2019 & NPD (Norwegian volume)

Equinor | Low Carbon Portfolio



US Hub



Project name	Project type	Country
Northern Lights	CCS Infrastructure	
Northern Endurance Partnership	CCS Infrastructure	
Net Zero Teesside	Clean power	UK
Keadby 3	Clean Power	UK
H2H Saltend	Blue H2	UK
Keadby Hydrogen	Clean power	UK
Peterhead	Clean power	UK
Smeaheia	CCS Infrastructure	
H2M Eemshaven	Blue H2	NL
H2BE	Blue H2	BE
Clean Hydrogen to Europe	Blue H2	NO
Barents Blue	Blue ammonia	NO
Polaris	CCS Infrastructure	NO
Tri-State Energy Hub	Blue H2	
NorthH2	Green H2	NL

Northern Europe Cluster





Tri-State Clean Energy Hub | Hub Initial Deployment



- Area uniquely positioned to become a low carbon energy cluster
- Vast energy resources and dense industrial activities
- CO2 storage opportunities
- Clean fuel: Reforming of natural gas to h2 in combination with CCS
- CO2 pipelines and H2 pipelines provides decarbonization options for industry





Tri-State Clean Energy Hub | 2040 Vision

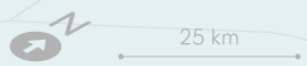
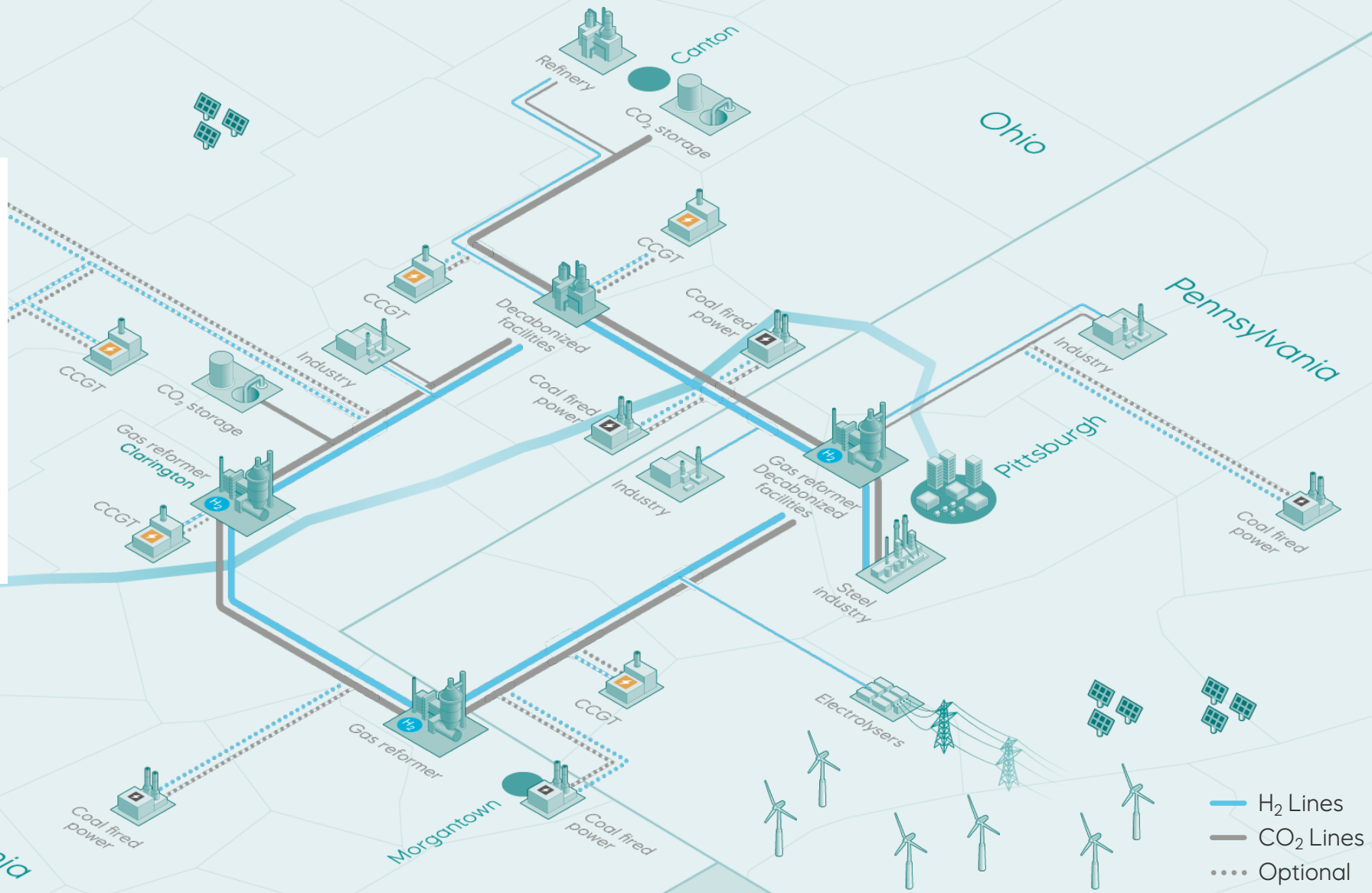


Full network

- Connect more industrial facilities, power plants, and transportation to decarbonization grid
- CO₂ storage at multiple sites
- 2040 projection: >70% emission reduction relative to 2019

1.5 Mt/y
H₂
used

30 Mt/y
CO₂
stored

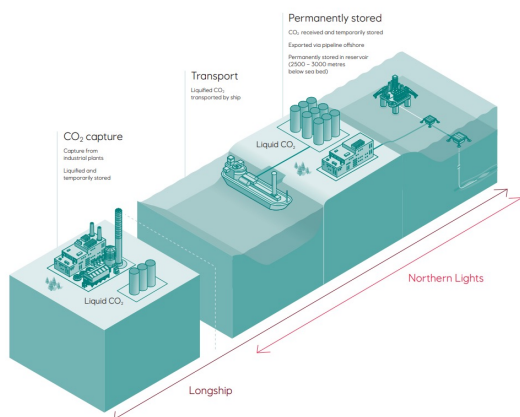


— H₂ Lines
— CO₂ Lines
... Optional

Equinor CCS portfolio

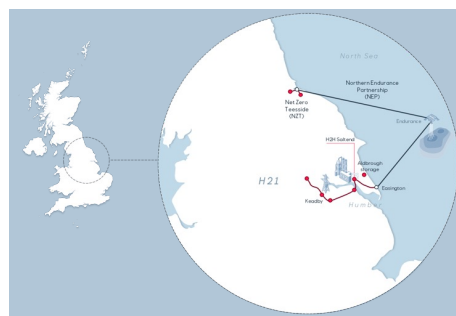
Northern Lights

2024



Northern Endurance Partnership

2026



Polaris

2027



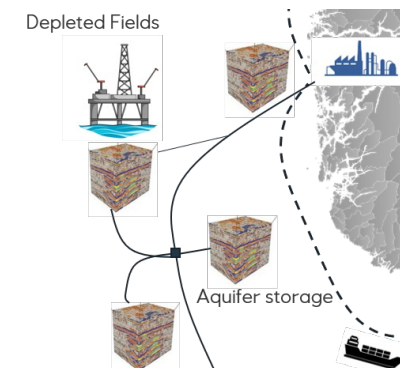
Smeaheia

2027



ArchiteCCS Multiple storage sites

> 2027



Phase 1

1.5 Mtpa

Scale-up

5 Mtpa

Phase 1

4 Mtpa

Scale-up

>25 Mtpa

Phase 1

2 Mtpa

Scale-up

>4 Mtpa

Phase 1

5-10 Mtpa*

Scale-up

20 Mtpa

Phase 1

5 Mtpa

Scale-up

>50 Mtpa

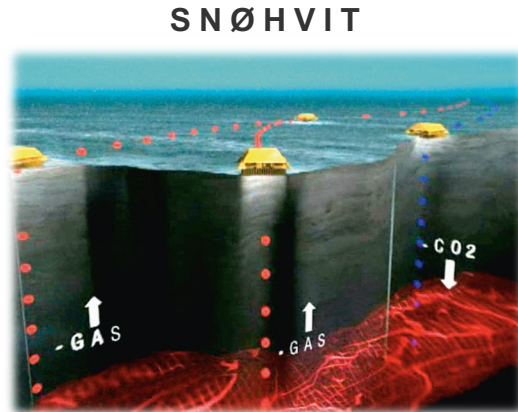
* Early estimate

Mtpa – million tonnes per annum (Gross volumes)

CCS scale up- Building on 26 years of operational experience and Northern Lights

15-30 Mtpa

CO₂ transport and storage capacity by 2035
Equinor share

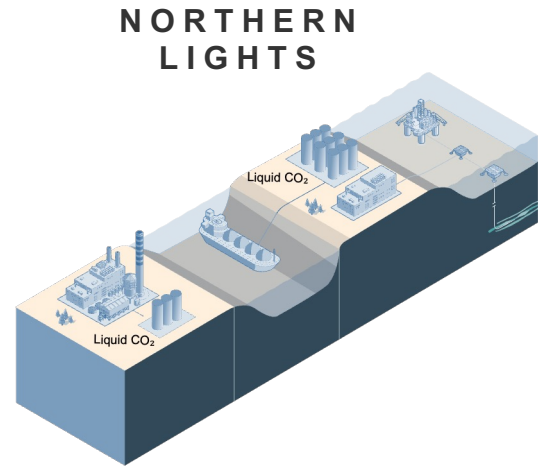


Snøhvit – Pipelined CO₂ from shore & sub-sea development

Equinor awarded the Smeaheia and Polaris CO₂ licenses

April 5, 2022 13:37 CEST | Last modified April 6, 2022 07:10 CEST

Equinor ASA: 40%
Polaris Energy AS: 30%
Vår Energi AS: 30%



Northern Lights – Market opener

SMEAHEIA

Smeaheia – Industrialisation of CCS

Development of future CO2 transport solutions

Shipping solutions



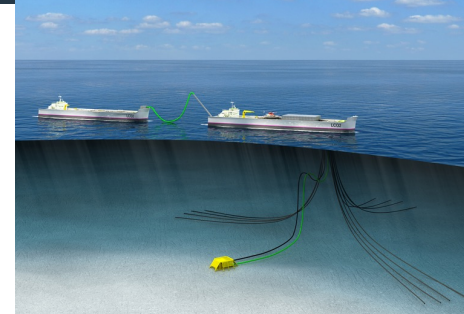
Medium pressure
CO2 ship transport
(7 500 m³)

Northern Lights
solution



Low pressure
CO2 ship transport
(~20 000m³ +)

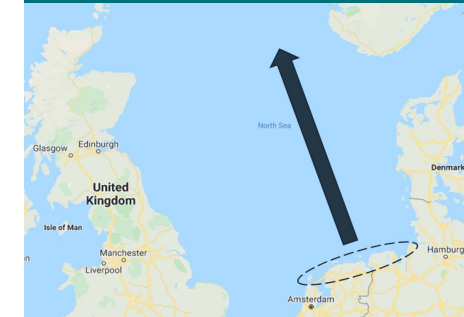
- Enable larger ships
- Enable offshore CO2 injection



Offshore CO2 offloading
/Offshore hub

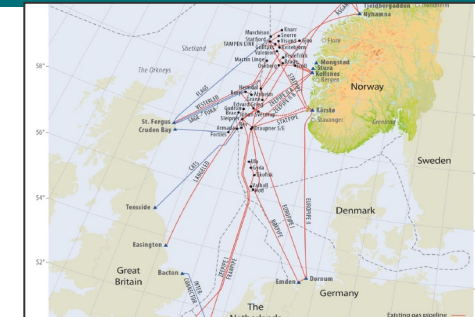
- Avoid costs related to receiving terminal & pipeline
- Increase flexibility

Pipeline



Study on new pipeline from
Europe to NCS

- Get reliable picture on costs & other challenges



Mapping existing pipelines
for CO2
&
Recertify existing pipelines
for CO2

Understand when which transport option is most cost-effective:

Optimal ship size & number

MP <-> LP ship transport

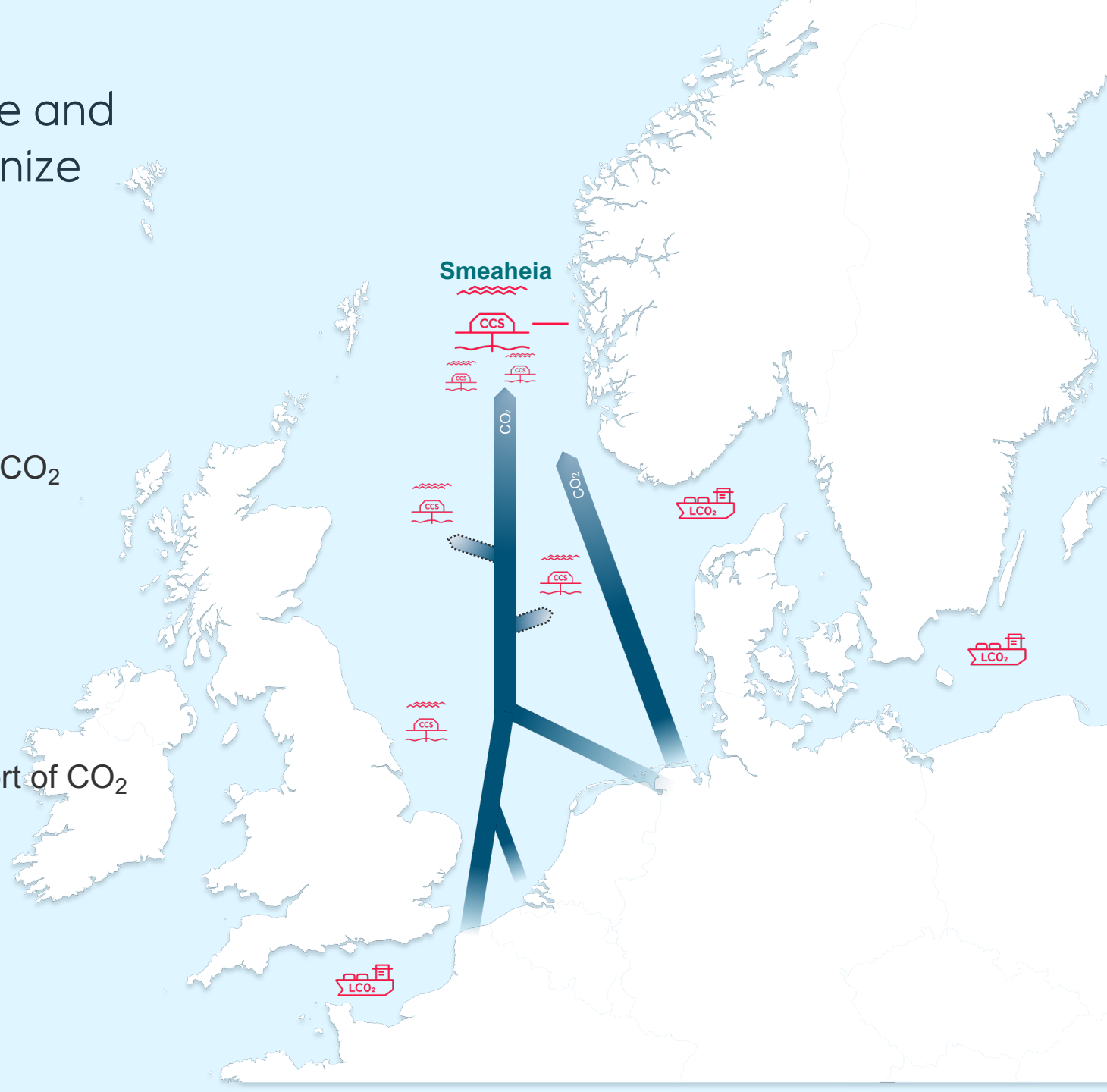
Ship transport <-> Pipeline

New pipeline <-> Re-use

Direct injection offshore <-> Onshore terminal

Developing large scale CO₂ storage and transport solutions to help decarbonize European Industry

- ❑ Developing a roadmap for connecting European CO₂ volumes to Norwegian storage options
- ❑ Preparing for a feasibility study
- ❑ EU Project of Common Interest (PCI) application
- ❑ Bilateral agreement that support pipeline transport of CO₂



Thank you

Vaibhava Singh, Business Development, Low Carbon Solutions

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