



Break-out Session for Task Force Carbon Capture Storage

15th Compliance Conference
26 November 2024

Welcome and Introduction

David Kramer

Discussion on CCS/CCU projects and key implementation issues

CCS TF Ad-hoc group on CO2 transport

Åshild Færevåg, Norway



Norwegian
Environment
Agency

TF CCS

Ad-hoc working group on CO₂ transport

- Paper on CO₂ transport operator using the Northern Lights project as an example

Discussion topics in the ad-hoc group

Non-papers

- Cross country transport of CO₂ – transfer of responsibility between countries
 - Status: released to the Commission by the Task Force
- CCS transport operator in EU ETS
 - Status: In work

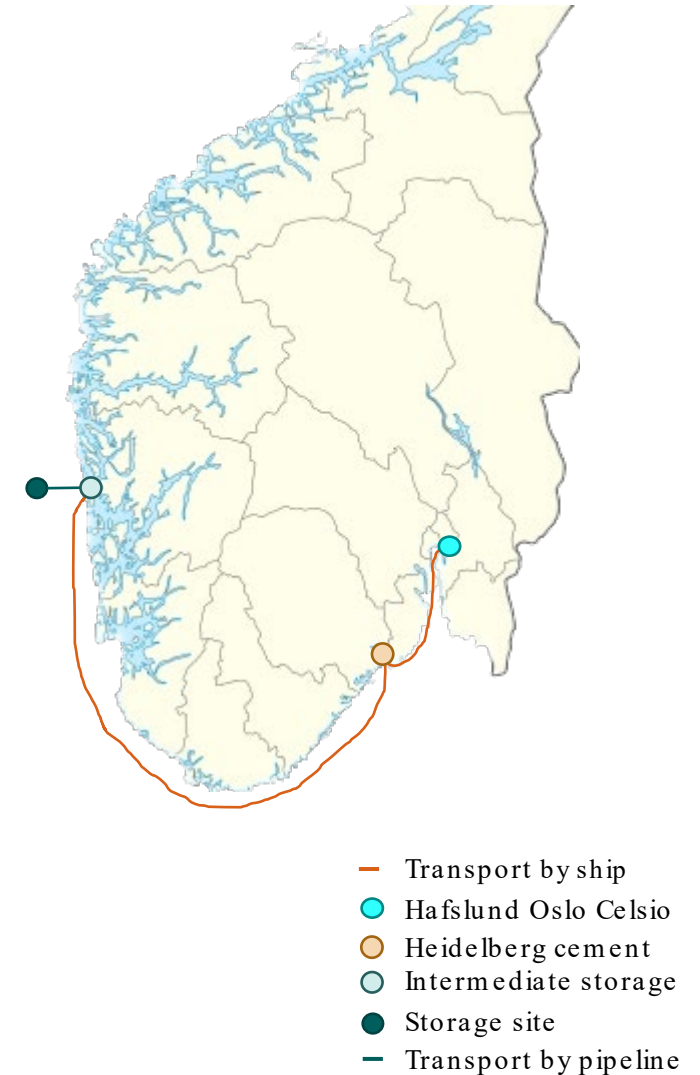


The Northern Lights project



Northern Lights / Longship

- Full-chain Carbon Capture and Storage project
- Capture CO₂ from industrial capture sources
 - cement
 - waste-to-energy
- Transport of CO₂ by ship to onshore facilities and transport by pipeline to the offshore storage complex
- Examples on upcoming **cross-border projects**
 - Yara Sluiskil (the Netherlands)
 - Ørsted biomass power station (Denmark)



Northern Lights – Latest status

- **Sept 24**
The transport and storage facility has been completed and is ready to receive and store CO₂
- **Oct 24**
CO₂ received by ships/trucks for testing of the onshore facilities
- **2025/2026**
Transport and store CO₂ captured from Heidelberg cement factory in Norway and Yara in the Netherlands

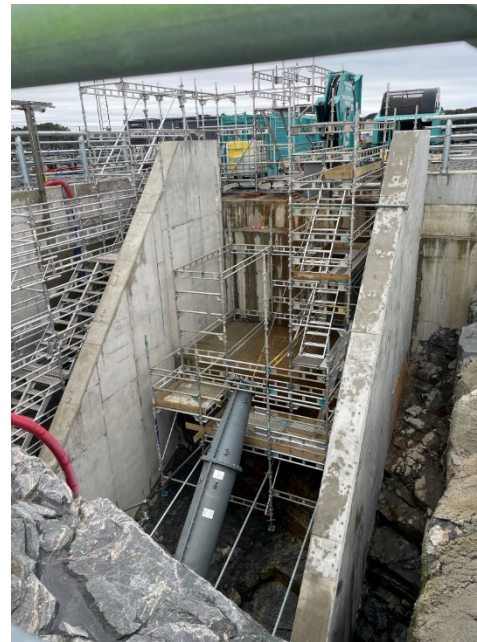



Photo: Norwegian Environment Agency

Northern Lights – ETS permit

- ETS permit issued in 2022
- Activities:
 - *2022: combustion of fuel > 20 MW*: drilling operations
 - *2023: storage of CO₂*: commissioning activities
 - *2024: transport of CO₂*: commissioning activities
- The permit will be updated soon:
 - *2025: receipt of CO₂ for storage*
 - methods in accordance with the revised MRR



Overvåkingsplan for Aurora

Overvåkingsplanen er godkjent av Miljødirektoratet.

1. Beskrivelse/omfang av anlegget

Tillatelsen til Aurora omfatter landanlegget i Øygarden, rørdledning ut til lagerkompleks og lager for geologisk lagring av CO₂ godkjent av Miljødirektoratet. Det er boret to brønner for injeksjon av CO₂ til lageret. Brønnene (31/5-A-7 AH og 31/5-C-1 H) er lokalisert ca 15 km vest for Troll øst.

Aurora har kvotepliktige utslipp av CO₂ ved bruk av mobil rigg og klargjøringsaktiviteter og vil etter planen motta CO₂ for geologisk lagring fra og med 2025.

En ytterligere beskrivelse av anlegget fremgår av følgende vedlegg:

- CO₂- utslippskilder *Transocean Enabler.pdf* av 16. september 2022,
- *Kildestrøm Klargjøring anlegget 2024.pdf* av 12. august 2024 og
- *Urea and Diesel Kildestrøm IMR fartøy.docx* av 11. juni 2024.

Ut fra det totale årlige estimerte utslippet beregnet iht. artikkel 47 i MR-forordningen, er anlegget plassert i kategori A og faller inn under definisjonen av anlegg med små utslipp (< 25000 tonn CO₂). Kravene i overvåkingsplanen er fastsatt i henhold til dette.

Denne overvåkingsplanen omfatter alle kildestrømmer/utslippskilder som angitt i punkt 2 under.

2. Kildestrømmer og utslippskilder ved anlegget

Anlegget har følgende kildestrømmer som gir kvotepliktige utslipp:

Kildestrøm	Delaktivitet	Utslippskilde	Kildestrøm-kategori
1. Diesel - Mobile rigger	Forbrenning av brensel: Kommersielle standardbrensel	Motor	Mindre
2. Urea - Mobile rigger - Nox rensing	Forbrenning av brensel: Kommersielle standardbrensel	Motor	De-minimis
3. CO ₂ fra CCS-aktiviteter - Overføring fra lastebiler for klargjøringsaktiviteter	CCS: Transport av klimagasser	Tanker, ventiler	Mindre
4. CO ₂ fra CCS-aktiviteter - Overføring fra fartøy for klargjøringsaktiviteter	CCS: Transport av klimagasser	Tanker, ventiler	Mindre

Med mobil rigg menes borerigger, floteller (boliginnretninger) og brønnintervensjonsskip. Krav til beregning av utslipp fra kildestrømmene er nærmere angitt i punkt 3 til 6.

3. Metoder for beregning av utslipp fra kildestrømmer

Anleggsoperatøren skal benytte følgende formler for å beregne utslippene fra de ulike kildestrømmene:

Kildestrøm	Beregningsmetode
1	CO ₂ -utslipp = Aktivitetsdata * Nedre brennverdi * Utslippsfaktor * Oksidasjonsfaktor
2	CO ₂ -utslipp = Aktivitetsdata * Utslippsfaktor
3 og 4	CO ₂ -utslipp = Aktivitetsdata * Utslippsfaktor * Oksidasjonsfaktor



ETS Implementation issues

Prev. discussed in TF CCS

- ☑ Transfer of CO₂:
Measurement principles
- ☑ Leakages and
vented/diffuse emission of
CO₂ from biogenic origin
- ☑ Mixed CO₂ streams

Upcoming issues

- ☐ Transport of CO₂ by ship –
National legislation, ETS
transport operator and CA
- ☐ Information exchange CAs –
CO₂ transferred cross border
- ☐ Other?

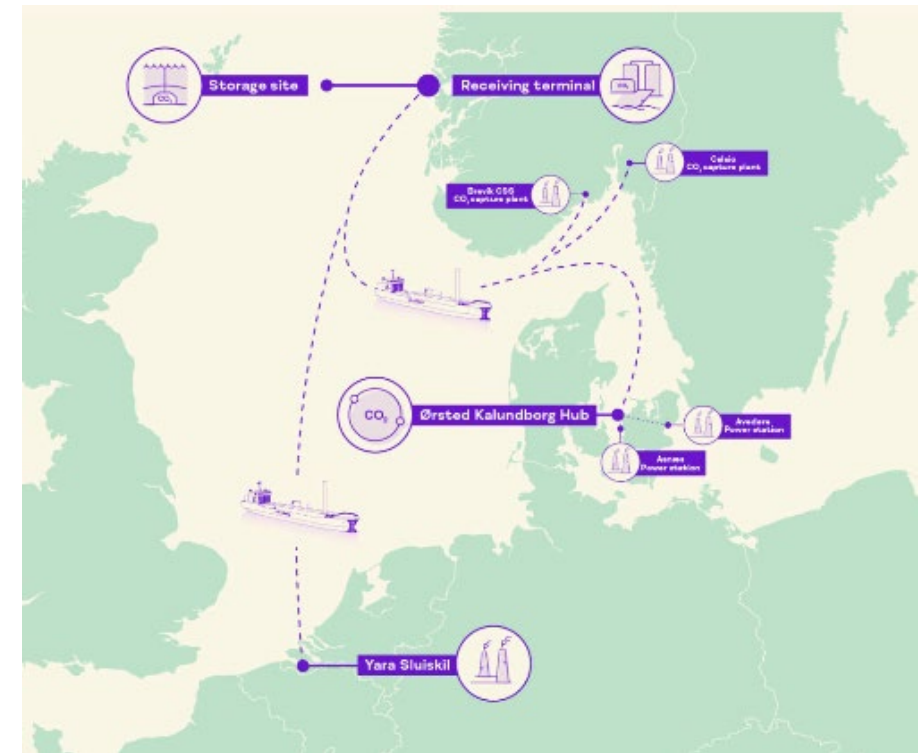
Example: Northern Lights project

2025

- 3 ships owned by Northern Lights JV
- CO₂ transported from NO and EU to the storage site
- Managed/controlled by K-Line

2026

- 4th ship owned by Bernhard Schulte (German company)
- CO₂ transported between NL and the storage site in NO



Source: Northern Lights (norlights.com)



Non paper: CCS transport operator in EU ETS



EU ETS Directive – Annex I Activities

Transport of greenhouse gases for geological storage in a storage site permitted under Directive 2009/31/EC, with the exclusion of those emissions covered by another activity under this Directive

- Leakages, vented and diffuse emissions of the transported CO₂
- The activity concerns *stationary installations* → an ETS permit and MP
- MR Regulation (EU) No. 2018/2066
- All types of transport

Maritime transport activities covered by Regulation (EU) 2015/757 with the exception of the maritime transport activities covered by Article 2(1a) and, until 31 December 2026, Article 2(1b) of that Regulation

- CO₂ emissions from the combustion of the ship's fuel (not the cargo)
- Transport activity → ETS monitoring plan
- MRV Regulation (EU) No. 2015/757
- Ship > 5000 gross tonnage



Non-paper: ETS transport operator

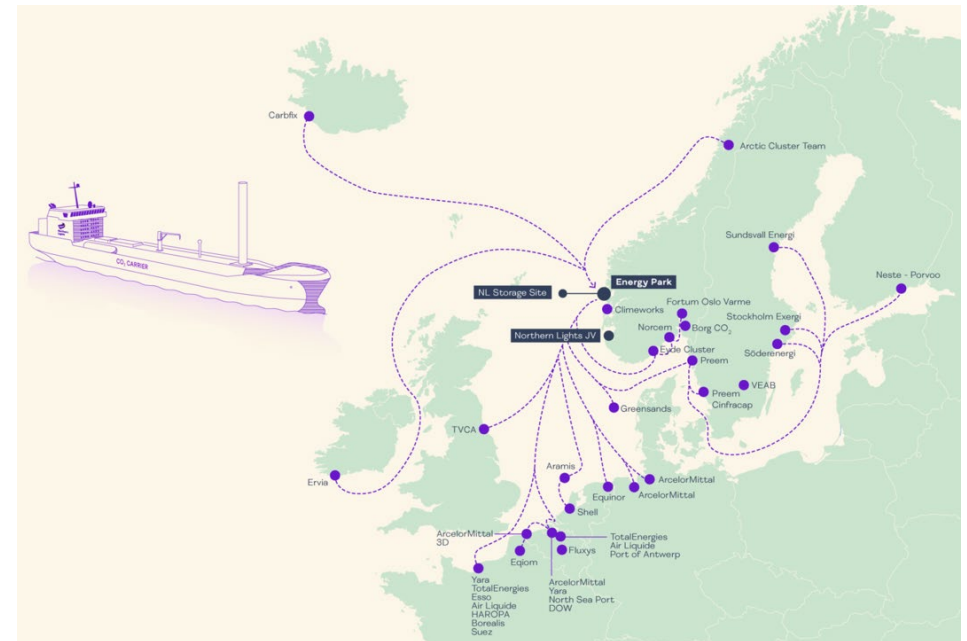
- CO₂ transport: Ship, truck, train, pipeline, etc.
- Transport of CO₂ is in the Directive defined as an activity for *stationary installations* (art. 3h)
- Definition of the *operator* of an installation (art. 3f)
- **Cross-border transport:** There is a lack of regulation compared to aviation and maritime transport



Non-paper: ETS transport operator

Problem

1. Who will be the operator responsible for the emissions from transport of CO₂?
2. Which Member State will administrate the transport operator?



Source: Northern Lights (norlights.com)

Options: transport operator

Option	Transport operator
0	Transport operator = Shipping company (operator for maritime transport activity)
1	Owner of the transport infrastructure
2	Entity managing / controlling the infrastructure
3	The operator of the storage site



Options: administering authority

Option	Administering Authority
1	Country where the transport operator is registered
2	The MS where the CO ₂ is stored
3	The MS where the CO ₂ is captured
4	Permit from each of the countries where the CO ₂ is in transit/transported through



We welcome any input and
comments 😊



Next steps for TF work plan

David Kramer

Conclusion remarks

David Kramer

Thank you for your attention