

Norwegian CCUS Clusters

Jørild Svalestuen, Gassnova

CLIMIT

Norwegian CCUS Industry Clusters

An advantage for adjacent industry to collaborate:

- to establish sound solutions and share costs for local infrastructure, logistics and transport.
- to source larger volumes of CO₂ for storage
- each cluster with their **own uniqueness**

- **Aluminium:** Alcoa, Hydro
- **Biorefineries:** Borregaard
- **Cement:** Norcem (HeidelbergCement)
- **Ferro silicon & Silicon:** Elkem, Wacker
- **Ferro Manganese:** Eramet, Ferroglobe
- **Lime:** NorFraKalk, SMA Mineral
- **Paper:** Norske Skog Saugbruks
- **Petrochemicals:** Ineos, Inovyn, Equinor
- **Reinforcement steel:** Celsa
- **Waste-to-Energy:** Celsio, BIR, Forus, Statkraft, Returkraft, Kvitebjørn



CO₂ Hub North

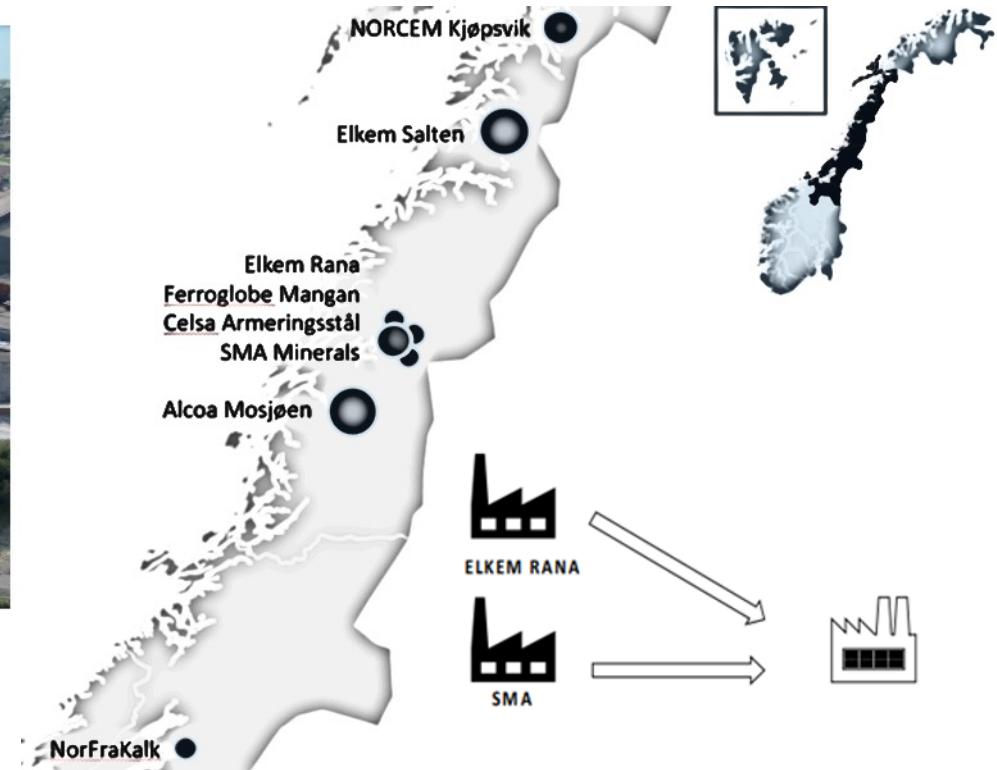


01.06.2022

The voyage towards carbon capture

Together with partners, Elkem has instigated a project for testing technology that captures CO₂ from smelters. This is the first time such technology is applied to flue gas emissions in the ferroalloy industry.

<https://climit.no/en/news/the-voyage-towards-carbon-capture/>



MTU from Aker Carbon Capture



World's #1
climate positive industry

GICCS 
Grenland Industrial CCS

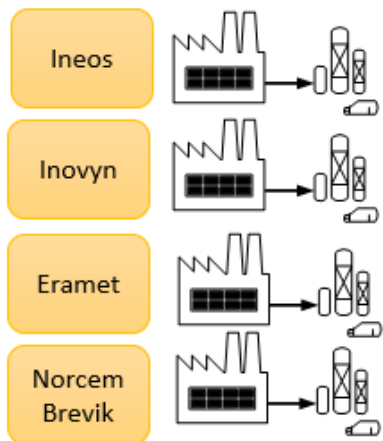


Photo: Styrk Fjærtøft

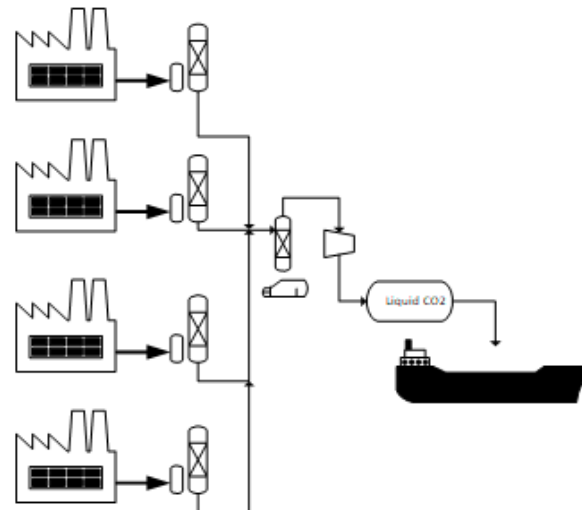
Grenland Industrial CCS

- are looking into a new interesting way of doing CO₂-capture.
- the CCUS cluster consists of
 - Cement
 - Ferromanganese
 - Petrochemical industry
 - DAC technology for fuel production
 - SINTEF
 - Tecnology providers

The usual way of evaluating CO₂ capture



New solution – common central desorber



Amine transported by pipelines to/from the emission points



Common central facilities:

- Amine CO₂ desorber
- Liquefaction of CO₂
- CO₂ storage
- Heat recovery unit / heat supply

From Common Facilities:

CO₂-lean amine

To Common Facilities:

CO₂-rich amine

A “Climate Cure” for Waste-to-Energy in Norway

The five largest Waste-to-Energy (WtE) plants in Norway has established an industrial cooperation called;

A climate cure for WtE industry in Norway

- To form a generic CCUS business model for the WtE industry – CLIMIT supported

WtE have a significant amount of biogenic CO₂

- Contributing to «negative CO₂-emissions» /Carbon Dioxide Removal (CDR).

Regulations and incentives for **CDR** is an important part of the CCUS business models within the WtE industry





CLIMIT & Gassnova regularly runs regularly CCUS webinars for the industry

Purpose:

- knowledge sharing and virtual networking
- Highlight areas within CCUS important for the industry

Some examples of topics for the webinars:

- Regulatory framework in EU, Sweden, UK and Netherlands
- Project development towards full-scale implementation of CO₂-capture
- Local infrastructure (quays, intermediate storage and logistics as part of clusters and beyond them)
- [CDR – BioCCS and DACCS](#)
- CCU



On the way
– green future