Spring 2025/Status of CO_2 Management

Summary

Significant progress has been made in both the Brevik CCS and Northern Lights projects. Commissioning activities are well underway at both sites, with Northern Lights reaching an overall progress of 99.1 % and Brevik CCS at 95,1 %. The CO_2 capture facility in Brevik completed its first "catch-and-release" event in February, marking a major milestone toward full operational readiness, summer 2025.

Northern Lights have achieved key milestones in shipping and terminal readiness, with two ships now delivered and Ship 3 progressing according to plan. Attention continues to be given to readiness for CO_2 injection and ship-shore coordination. International interest remains high.

Hafslund Celsio has restarted the process of building the full-scale carbon capture plant at Oslo's Klemetsrud facility (Oslo CCS), operational by 2029. Capturing 350,000 tonnes of CO_2 annually, it's Oslo's key climate measure. Backed by public and private funding, the project joins Norway's Longship initiative.

Strategic media visibility and high-profile visits to Northern Lights, Brevik CCS and Oslo CCS, continues to support Norway's leadership in carbon capture and storage. The Longship project is set to be ready for operation in 2025, with CO_2 captured at Brevik CCS, transported, and permanently stored through Northern Lights.

Percentage completed as of the end of February 2025:

Northern Lights	Brevik CCS	Hafslund Celsio
99,1%	95,1%	N/A

Gassnova SF, 31 March 2025

Background on Longship

- **Longship** is a Norwegian carbon capture and storage (CCS) project, partially funded by the government. The project aims to demonstrate industrial CCS in a whole value chain and by that assist Europe in achieving carbon neutrality, help reduce CO_2 emissions from high emission sectors and enable industrial carbon removal by capturing biogenic CO_2 (negative emissions)
- A carbon capture facility is under construction at Heidelberg Materials' cement plant in **Brevik (Brevik CCS)**, with plans to capture around 400,000 tons of CO_2 annually.
- Hafslund Celsio began construction of a carbon capture facility at its waste incineration plant in **Oslo (Oslo CCS)** in August 2022. January 2025 the project was fully assumed after it was put on hold in April 2023, due to cost estimates. The facility is expected to capture approximately 350,000 tons of CO_2 annually.
- **Northern Lights** is developing a solution for the transfer and storage of CO_2. CO_2 will be transported by ship from various emission sources, including Heidelberg Materials and Hafslund Celsio, to a reception facility near Bergen. From there, CO_2 will be piped for permanent storage, 2,600 meters below the seabed.

Roles in Longship

- **Ministry of Energy** – Responsible for Norway's CCS policy and Longship on behalf of the government
- **Ministry of Foreign Affairs** – Coordinates Norway's foreign service and embassies
- **Gassnova** – A state-owned enterprise following up on Longship on behalf of the Ministry of Energy
- **Northern Lights** – A company (a joint venture owned by Equinor, Shell, and TotalEnergies) tasked with receiving CO_2 from Heidelberg Materials and Hafslund Celsio. Northern Lights offers transport and storage services to several companies across Europe
- **Brevik CCS** – Heidelberg Materials' carbon capture project at the cement plant in Brevik
- **Oslo CCS** – Hafslund Celsio is owner of a waste incineration plant in Oslo. A new project plan for their CO_2 capture project was approved in January 2025

Industry Projects in Longship

Northern Lights

Expands Capacity Following Commercial Agreement

Northern Lights is expanding its CO_2 transport and storage capacity from 1.5 to at least 5 million tonnes per year. This decision follows a 15-year agreement with Swedish energy provider Stockholm Exergi to handle up to 900,000 tonnes of biogenic CO_2 annually. The NOK 7.5 billion investment is made by Equinor, Shell, and TotalEnergies, with support from the EU's Connecting Europe Facility. New infrastructure in Øygarden will include storage tanks, injection wells, and transport vessels. Phase 2 is set to be operational by 2028, marking a major step in scaling commercial CCS across Europe.

Status and Progress

Northern Lights has reached 99.1 % completion. The onshore plant at Øygarden has completed commissioning of booster and export pumps using both gaseous and liquid CO_2. Marine Loading Arms have been connected and tested, and the Shore Power interface is in place. Ship 1 (Northern Pioneer) arrived in Norway in February and completed its first call at Øygarden. Ship 2 (Northern Pathfinder) arrived in Norway in March and has completed bunkering operations and is preparing for its next milestones. Construction of Ships 3 and 4 remains on track.

International Agreements and Visibility

The Northern Lights JV has continued advocacy efforts, participating in major industry events and engaging with potential customers and partners. As of February 2025, visits to the site totalled nearly 12,000 since construction began – with continued media coverage from national and international outlets including Bloomberg, NRK, and Dagens Næringsliv.

Images and illustrations – News, media and technical reports - Northern Lights (norlights.com)

Brevik CCS

Status and Progress

The Brevik CCS project achieved 95,1 % total progress as of the end of February. The startup phase is advancing well, with the first catch-and-release of CO_2 successfully executed. Captured CO_2 will be transported to Øygarden and permanently stored under the North Sea by Northern Lights.

Financial and Schedule

Despite minor deviations, the project remains on track to achieve its "Ready for First Load Operation with CO_2" milestone by spring 2025. Financially, cost forecasts are under control, with no major overruns reported by February.

Images and illustrations – Brevik Media | Heidelberg Materials

Oslo CCS

Carbon Capture in Oslo is Moving Forward

Hafslund Celsio has resumed its carbon capture project at the Klemetsrud waste-to-energy plant in Oslo. In partnership with Aker Solutions and SLB Capturi, the company will build one of the world's first full-scale carbon capture facilities for waste incineration. Plant is scheduled to be operational by Q3 2029 and will capture 350,000 tonnes of CO_2 annually – half from fossil sources, half biogenic, enabling permanent carbon removal.

As part of Norway's Longship project, captured CO_2 will be transported to the Oslo port terminal and permanently stored under the North Sea by Northern Lights. The project is expected to cut nearly 20% of Oslo's remaining fossil emissions, making it the city's single most important climate initiative.

This pioneering effort will serve as a model for other waste incineration sites in Europe and beyond. Construction begins following the final investment decision made in January 2025, with carbon storage secured for 10 years through the Longship initiative.

Images and illustrations – Mediebank | Hafslund (ntb.no)

CO_2 Storage in Europe

As of late March 2025, CCS initiatives in Europe are experiencing advancements. From a Norwegian perspective, these developments underscore the growing recognition of CCS as a vital tool for achieving climate goals across Europe. Norway's expertise and infrastructure position it as a key player in fostering collaborative efforts and advancing CCS deployment continent-wide.

International Collaborations

Polish refiner Orlen and Equinor signed a memorandum of understanding in March 2025 to jointly develop CCS projects. This partnership focuses on identifying potential CO_2 storage sites in Poland, including onshore areas and the Baltic Sea, with the goal of capturing and storing up to 4 million metric tons of CO_2 annually by 2035.

One of World's Largest Carbon Removal Plants

Stockholm Exergi has decided to build one of world's largest facilities for capturing and permanently storing biogenic CO_2. The SEK 13 billion investment marks a major milestone for achieving negative emissions, helping Sweden and the EU reach long-term climate targets. Construction will begin immediately, with operations set to start in 2028. Located near the Värtan facility, the plant will remove 800,000 tonnes of CO_2 annually – more than Stockholm's Road traffic emissions.

Project Milestones

In December 2024, the UK's first commercially viable carbon storage facility received approval. Led by BP and Equinor, this £4 billion project plans to inject up to 4 million tonnes of CO_2 annually into storage sites beneath the North Sea, with operations expected to commence by 2028.

Policy Developments in Europe

The Net Zero Industry Act (NZIA) came into force in June 2024. NZIA sets an annual CO_2 injection capacity for the EU of at least 50 million tons by 2030 in geological storage sites. By 30 June 2025, EU member states will need to submit a plan to the Commission specifying in detail how the entities[1] will meet their contribution to the EU's CO_2 injection capacity objective by 2030.

The Clean Industrial Deal (CID) was launched in February 2025 and is a strategic initiative by the European Commission aimed at accelerating decarbonization of European industry. The new measures will complement the roll-out of the EU's long-standing objective to create a market for captured carbon. As part of the CID, the Commission proposes to launch a European Industrial Decarbonization Bank, a multi-source funding strategy consisting of a €100 billion budget. It will be financed through the Innovation Fund, the reinforced InvestEU program and additional revenues from specific parts of the carbon market.

The UK government has committed nearly £22 billion over 25 years to fund critical CCS projects, aiming to decarbonize heavy industries and support the nation's net-zero emissions target by 2050.

[1] Each entity holding an authorisation as defined in Article 1, point 3, of Directive 94/22/EC

Support

Useful links

- Spørsmål og svar om Langskip-prosjektet - regjeringen.no (ENG/NO)
- Tidslinje for Langskip (CCS) - regjeringen.no (ENG/NO)
  Full-scale CCS project in Norway - Longship | Reaching the climate goals (ccsnorway.com) (ENG/NO)
- Northern Lights (norlights.com) (ENG/NO)
- Brevik CCS (ENG/NO)
- https://www.celsio.no/karbonfangst-ccs/ (ENG/NO)

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