



Leap forward for an ambitious carbon capture & storage project

by Fitzwilliam Scott

Greenport Scandinavia – a project partnership consisting of INEOS Energy, Wintershall Dea, Evida, Biocarb Solution, the Port of Hirtshals, Aalborg Portland, Greenport North, EUC Nord, Hydrogen Valley, and Energy Cluster Denmark – has been granted €14.6 million by the EU Just Transition Fund to support the establishment of value chains for the capture, usage, and storage of carbon dioxide (CCUS). The size of the support underlines the initiative's crucial importance for both the Danish and European goals of achieving net-zero emissions. The first vessel with liquefied CO₂ is set to depart from Hirtshals in 2025.

The Port of Hirtshals is in the middle of planning a major step-up, which is expected to be completed in 2027. The increased area and improved accessibility – and, naturally, favourable access to geological storage sites – means that the Danish seaport will be well-positioned to become a leading European hub for the storage and shipment of CO₂. “We are in the midst of planning a significant expansion of the Port of Hirtshals, and in this context, the establishment of Northern Europe's largest CO₂ hub fits perfectly into our strategy. Making Hirtshals a hub for the storage and shipment of CO₂ is obvious because our location is ideal in relation to the storage sites in the North Sea as well as potential future onshore or nearshore sites,” emphasises Per Holm Nørgaard, the port's CEO.

In a nutshell, the ambition is for the seaport in Northern Denmark to develop into a hub for receiving significant amounts of CO₂ from both home and abroad for intermediate storage. Subsequently, the CO₂ is to be permanently stored in the empty oil & gas fields of the Greensand area in the Danish part of the North Sea (or in potential nearshore and onshore storages in North Denmark).

Off the ground

The project, which is the first of its kind in Europe with a complete value chain in place, will be rolled out in three phases.

The first involves the capture and storage of CO₂ from regional biogas plants, transported by truck to an intermediate storage in the Port of Hirtshals before shipping to Greensand. Initially, the aim is to establish an annual shipment volume of up to 500,000 tonnes of CO₂ from biogas plants in Northern Jutland starting from 2025/26.

Since the CO₂ captured in biogas plants involves carbon that is absorbed as the processed plant matter grows, storing it will result in negative emissions. This means that the project can make a significant contribution to achieving the European net-zero-by-mid-century goal (and, on the way there, contribute to the new goal of 90% emission reduction by 2040).

In the second phase, the potential volume is expected to increase to about 3.0mt/year from 2029, following the laying of CO₂ pipe infrastructure to the intermediate storage facility in the Port of Hirtshals. The initial stretch is planned between Hirtshals and Aalborg to enable the transport of larger amounts of CO₂ from industrial emitters, such as Aalborg Portland, Denmark's only cement producer.

The company – part of the multinational Cementir Holding – has recently confirmed their goal to achieve net-zero emissions by 2050, committing to a cap on emissions of a maximum of 600kt/year by 2030 (a 73% cut compared to 2021). Michael Lundgaard Thomsen, Aalborg Portland's CCO, says,

“We have joined Greenport Scandinavia because it is essential for Aalborg Portland to engage in an ambitious project that is already off the ground and ready and able to build a strong Danish CCUS infrastructure and deliver a reliable, safe and cost-effective CO₂ handling solution as soon as possible.”

In the third phase, the potential volume is expected to exceed 15mt/year if Danish and Northern European infrastructures are connected in the early 2030s. Hence, the hub will be using the available off-, on-, and nearshore storage options to the fullest.

Fortifying the green transition

Greenport Scandinavia's project partners INEOS and Wintershall Dea hold a storage license for Greensand from the Danish authorities. In March 2023, Project Greensand demonstrated the feasibility of cross-border, offshore CO₂ storage across the entire value chain from capture to transport and storage, thus paving the way for the development of a full-scale international CCUS value chain to commence storage from 2025.

The world's first cross-border CO₂ storage was officially celebrated at an exclusive event in Esbjerg in the presence of then the Crown Prince, now King Frederik of Denmark, who initiated the injection of CO₂ into the reservoir, and Lars Aagaard, the Danish Minister for Energy, Climate and Utilities, with Ursula von der Leyen, President of the European Commission, delivering a pre-recorded address.



Photo: Port of Hirtshals

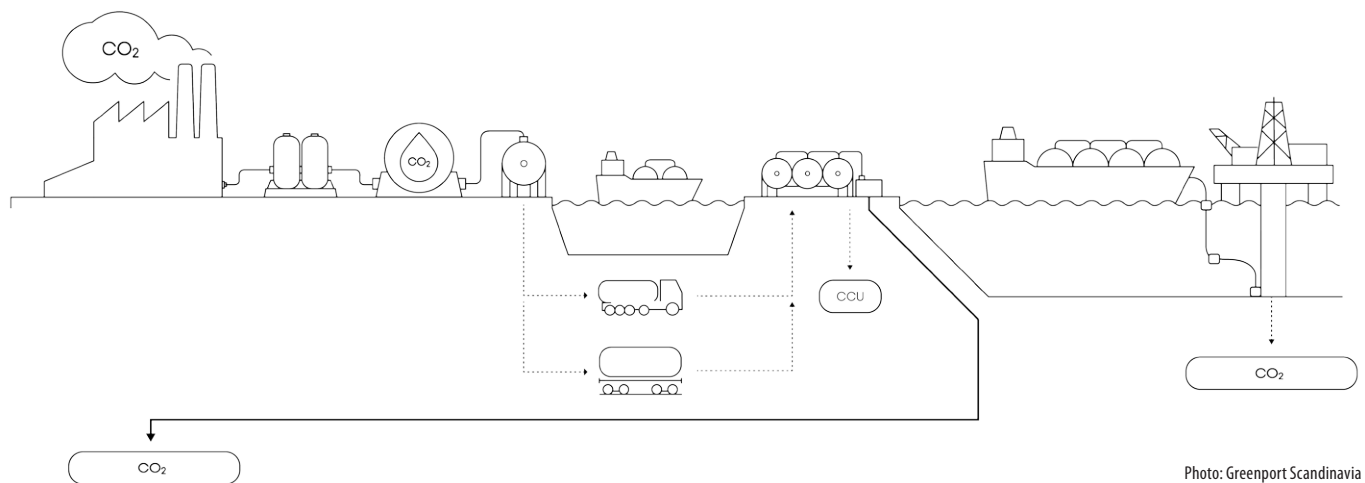


Photo: Greenport Scandinavia

Greenport Scandinavia aims to provide emitters with alternative storage options as these become available. Applications for onshore CO₂ storage licenses from nine companies and consortia are currently under review by the Danish Energy Agency (and nearshore areas are expected to be tendered soon).

The EU Just Transition Fund, which supports the advancement towards climate neutrality by alleviating its socio-economic impact in the regions most affected, backs these far-reaching plans. On the allocation of €14.6m to Greenport Scandinavia, Morten Bødskov, the Danish Minister for Industry, Business and Financial Affairs, stated, “Green technologies play a crucial role in achieving the green transition. Storage of CO₂ is a significant part of the solution to meet the government’s ambitious goal of

climate neutrality by 2045. North Jutland is already well on its way to becoming an attractive market for investments in the capture, utilisation, and storage of CO₂. I look forward to learning more about the new projects in the pipeline. This contributes to securing local jobs while providing substantial growth opportunities for the rest of society. Ambitious initiatives such as Greenport Scandinavia play a pivotal role in fortifying Denmark’s robust standing, guaranteeing our leadership in the ongoing and future green transition.”

New value

With the entire value chain and offshore storage in place, Greenport Scandinavia is positioned to be ready to receive CO₂ by truck, train, or ship in the Port of Hirtshals before the end of 2025. In addition to managing CO₂ from emitters, Greenport Scandinavia will be supporting potential carbon clusters wishing to tap into the knowledge and experience gained in developing new value chains and designing commercially viable multi-stakeholder business models for CO₂ management. □



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The vision behind the project is to establish carbon capture, utilisation, and storage (CCUS) activities and create one of Europe's largest CO₂ import and export hubs in the Port of Hirtshals. Its mission is to create commercial CCUS value chains across geographical and industrial sectors. The purpose of the Greenport Scandinavia initiative is to support the Paris Agreement in limiting global warming to 1.5°C. Head to greenportscandinavia.com to learn more about the project as well as the **partners** spearheading the progress.