

# Undersea graveyard for imported CO<sub>2</sub> opens in Denmark

March 8 2023, by Camille BAS-WOHLERT

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Denmark on Wednesday inaugurated a project to store carbon dioxide 1,800 meters beneath the North Sea, becoming the first country in the world to bury CO<sub>2</sub> imported from abroad.

"Today we opened a new chapter for the North Sea, a green chapter," Denmark's Crown Prince Frederik said at the inauguration ceremony in the town of Esbjerg in the west of Denmark.

The CO<sub>2</sub> graveyard, where the carbon is injected to prevent further warming of the atmosphere, is on the site of an old oil field.

Led by British chemical giant Ineos and German oil company Wintershall Dea, the "Greensand" project is expected to store up to eight million metric tons of CO<sub>2</sub> per year by 2030.

Still in their infancy and costly, carbon capture and storage (CCS) projects aim to capture and then trap CO<sub>2</sub> in order to mitigate global warming.

Over 200 similar projects are currently operational or under development around the world.

But unlike other projects that store CO<sub>2</sub> emissions from nearby industrial sites, Greensand brings in the carbon from far away.

"It's a European success story of cross border cooperation," Ursula von

der Leyen, president of the European Commission, said in video message played at the ceremony.

First captured at the source, the CO<sub>2</sub> is then liquefied—in Belgium in Greensand's case—then transported, currently by ship but potentially by pipelines, and stored in reservoirs such as geological cavities or depleted oil and gas fields.

At Greensand, the carbon is transported in special containers to the Nini West platform, where it is injected into an existing reservoir 1.8 kilometers (1.1 miles) under the seabed.

Once the pilot phase is completed, the plan is to use the neighboring Siri field as well.

Danish authorities, who have set a target of reaching carbon neutrality as early as 2045, say this is "a much needed tool in our climate toolkit".

Ineos CEO Brian Gilvary said at the opening that at full-scale, the project could meet 40 percent of Danish requirements to reach "net zero" and that it could account for 2.5 percent or up to three percent of European requirements.

## **North Sea advantages**

The North Sea is particularly suitable for this type of project, as the region already has pipelines and potential storage sites after decades of oil and gas production.

"The depleted oil and gas fields have many advantages because they are well understood and there are already infrastructures which can most likely be reused," said Morten Jeppesen, director of the Danish Offshore Technology Center at the Technical University of Denmark (DTU).

Near the Greensand site, France's TotalEnergies is also exploring the possibility of burying CO<sub>2</sub> with the aim of trapping five million tons per year by 2030.

In neighboring Norway, carbon capture and storage facilities are already in operation to offset domestic emissions, but the country will also be receiving tons of liquefied CO<sub>2</sub> in a few years' time, transported from Europe by ship.

As Western Europe's largest producer of oil, Norway also has the largest potential for CO<sub>2</sub> storage on the continent, particularly in its depleted oil fields.

## **Room for improvement**

While measured in millions of tons, the quantities stored still remain a small fraction of overall emissions.

According to the European Environment Agency (EEA), the member states of the EU emitted 3.7 billion tons of greenhouse gases in 2020 alone, a year that also saw reduced economic activity owing to the COVID-19 pandemic.

Long considered a complicated solution with marginal use, carbon capture has been embraced as necessary by the UN's Intergovernmental Panel on Climate Change (IPCC) and the International Energy Agency (IEA).

But it remains far from a miracle cure for global warming.

The energy-intensive process to capture and store the CO<sub>2</sub> itself emits the equivalent of 21 percent of the gas captured, according to the Australian think tank IEEFA.

And the technology is not without risks, according to the think tank, which says potential leaks could have severe consequences.

Furthermore, the cost of the project has not been made public.

"The cost of CO<sub>2</sub> storage must be reduced further, so it will become a sustainable climate mitigation solution as the industry becomes more mature," Jeppesen said.

The technology also faces opposition from environmentalists.

"It doesn't fix the problem and prolongs the structures that are harmful," Helene Hagel, head of climate and environmental policy at Greenpeace Denmark, told AFP.

"The method is not changing our deadly habits. If Denmark really wants to reduce its emissions it should look into the sectors that are producing a lot of them," she said, singling out sectors such as agriculture and transportation.

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