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TITLE Why store CO_2 in chalk?

SUBTITLE Chalk suitability for CO_2 storage

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There are a number of reasons why chalk formations in Denmark are good repositories for storing CO_2.

1. It is present within the subsurface over extensive areas, not just in Denmark, but across much of Western Europe.
2. It is a relatively cheap option to re-use depleted oil and gas fields for CO_2 storage thanks to the presence of existing infrastructure to inject and transport CO_2, such as wells, platforms and pipelines.
3. It's a safe choice to ensure CO_2 will remain trapped for thousands of years, as the reservoirs in question have contained hydrocarbons during millions of years, and as energy companies in Denmark have decades of experience developing and operating chalk fields offshore Denmark.
    - Chalk formations in depleted oil and gas fields have a large storage capacity thanks to:
        i. comparatively high porosity compared to sandstone formations.
        ii. the presence of residual oil into which CO_2 dissolves more easily than into water.
        iii. controlled and compact storage environments thanks to proven and well-understood trap structures, with decades of monitoring and modelling history.
        iv. good containment and low leakage risk thanks to low reservoir permeability, proven caprocks, and multiple barriers against flow to surface.
    - It may be possible to store over 1000 million tons of CO_2 in depleted chalk fields, which is sufficient to meet all of Denmark's CO_2 emissions for the next 40 years.

The research program aims to determine:

- How fast CO_2 will move through the reservoir and how efficiently part of it will be absorbed by oil and water, which will determine the ultimate CO_2 storage capacity.
- What the impact will be of CO_2 dissolved in water on rock properties, particularly chalk dissolution and rock strength, which may affect injectivity, storage capacity and containment efficiency.

The overall aim of this programme is to establish a safe operating envelope for CO_2 injection and demonstrate that chalk container integrity is sound for all realistic operational CO_2 storage scenarios.


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