

Carbon Capture and Storage (CCS)

Can rocks really save us from Climate Change?

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Concerns with CCS:

Capture^(5, 7)

- no effective AND cheap method
- emission of monoethanolamines
→ Norway Technic Centre Mongstad Power Plant:
300.000 t/a CO₂ captured
16 - 930 t/a amines emitted

Transport^(1, 2, 3)

- Pipeline leakages
→ Severe risk for health and environment
→ leakage rate must be <0.1% to achieve 750 ppm atmospheric CO₂
- expensive step of CCS
→ 1-8 USD/t CO₂ per 250 km

Storage^(6, 8)

- Pressure may cause problems
→ earthquakes
→ microseismic activity
→ reactivation of fault zones leading to CO₂ escape

Monitor⁽⁸⁾

- Corrosion of storage seals
- failure of seal leading to CO₂ escape

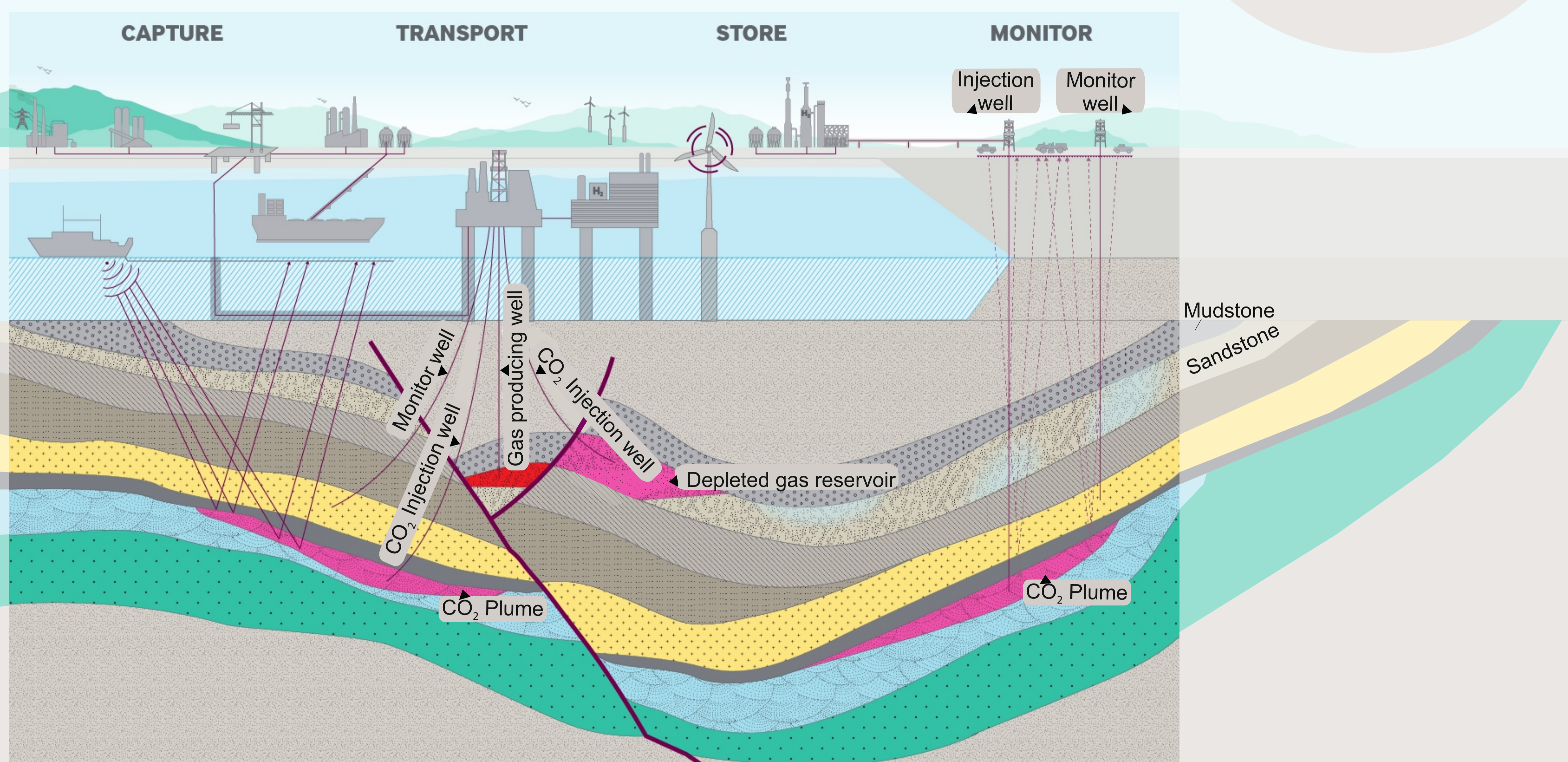


Fig. 1: Conceptual model of Carbon Capture and Storage (CCS) showing the different steps of the process and potential geological storages^(9, changed)

Which rocks work best?⁽⁴⁾

Unmineable coal seams

- + structures provide a large storage capacity
- connected to high costs and not available in all regions

Mined salt domes

- + custom designed and offering a high storage integrity
- high costs and limited availability

Deep saline aquifers

- + widespread availability and large capacities
- integrity of this option is not completely understood

Active/Depleted oil & gas reservoirs

- + enhanced hydrocarbon recovery and established infrastructure provides economically valuable possibility
- complications with residual hydrocarbons and availability for immediate injection

What does all of this mean?

Even though the method is to be considered a valuable approach to reduce CO₂-emissions in a timely manner, there are a lot of complications.

Most importantly risks for health and ecosystem can not be accepted for the attempt to lower our emissions. Combined with the low leakage requirement to achieve 750 ppm atmospheric CO₂ the question „Is it worth our health?“ has to be asked.

To really achieve a positive change with CCS, the factors risk and economic value have to be researched intensively.

Furthermore the geological situation has to be evaluated precisely each time to guarantee a long-term storage option.

If you want to do it, do it right!
Would you use CCS?

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