November 14th, 2023
Brussels, Belgium

DigiMon

Digital Monitoring of CO2 storage projects

BioNET

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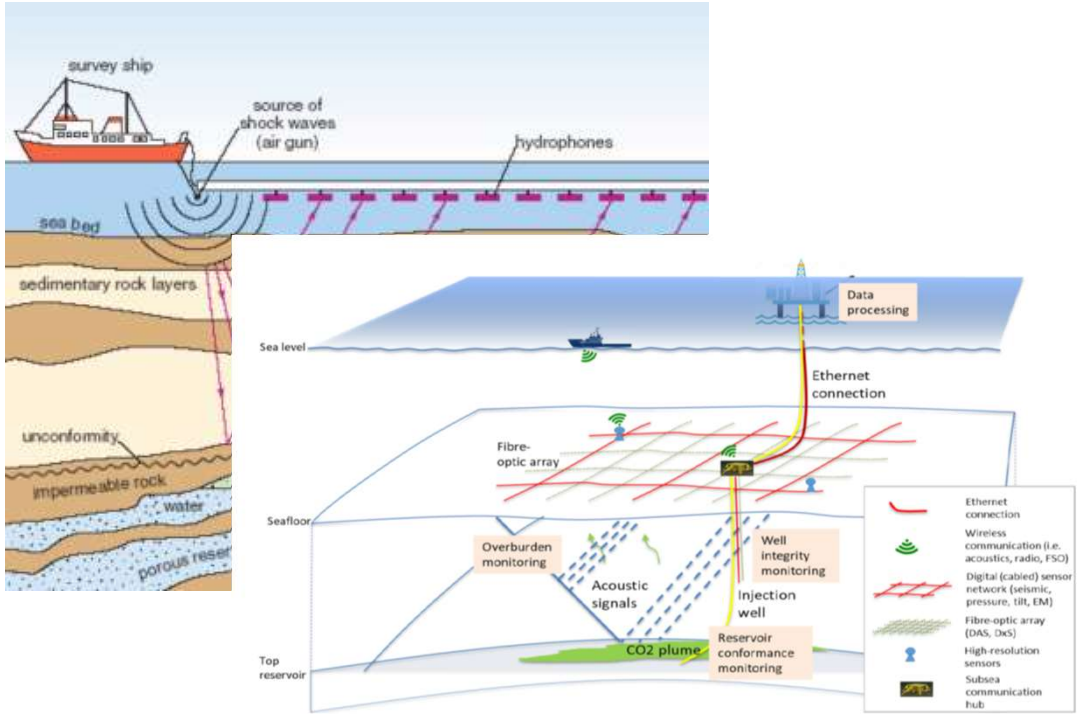
Helmholtz Centre for Environmental Research | Leipzig | Germany

Funded by the European Union

Baseline – DigiMon



Context: CCS was controversially discussed in many countries; the security of storage has been one focus point of these discussions

Objective: Develop a cost effective, human centred and smart digital monitoring system for CO_2 storage projects

Open question: What role does monitoring play in the perception of CCS?

Previous research on public perception indicates mixed views on CCS, no detailed knowledge on the relation of storage monitoring and perception

Methodology

Case study regions	Norway	The Netherlands	Germany	Greece
Previous projects	Yes	Yes	Yes	No
Public opposition	No	Yes	Yes	/
Ongoing projects	Yes	Yes	No	No

Semi-structured Interviews

↓

Surveys

↓

Expert and stakeholder workshops

How does monitoring affect the public perception of CCS and especially of carbon storage?

What should a human centred monitoring system look like?

Analytical instrument:

Societal Embeddedness Level Framework (Environment, Stakeholders, Market/Ressources, Policy /Regulations)

Baseline – BioNET: Multi-level Assessment of Bio-based Negative Emission Technologies

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CDRterra

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Context: CDR is crucial to achieve climate goals, however, regional implementation remains unclear

Objective: Multicriteria assessment of bio-based negative emission technologies in Germany

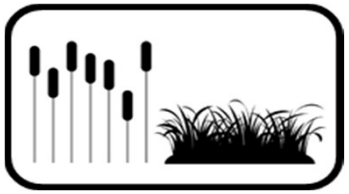
Open question: How can BECCS be implemented regionally? What is required to make this feasible?

Previous research: Mostly research on national level

Methodology

Bio-based NETs

BECCS



Peatlands & paludiculture

Forest management

Agriculture & soil management

Long lived building materials options

1. **Providing information** (data base and tech fact sheets) on CDR (n=24)
2. **Participatory approach** (surveys, interviews, workshops) to assess social and institutional fesibility in three German regions:

| Mecklenburg Western Pomerania | Central Germany | Rhine-Neckar-Region

3. **Comprehensive analysis of national scenarios** for CDR

➢ **Policy recommendation:**

| Participatory evaluation | data and modeling on potentials |

Summaries

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Digital Monitoring of CO2 storage projects

- Country differences on concerns about carbon storage in interviews and survey
- Main concerns about CO2 storage in all four countries
  - Safety (e.g. leakages, induced seismicity)
  - Political risks (e.g. delayed decarbonisation)
  - Uncertainty (e.g. long-term impacts of the storage site)

↳ Concerns can only partially be addressed by monitoring

- **44-62%** believe a monitoring system would limit concerns about CO2 storage

BioNET

- BECCS relevant for **CCS policy and regulation**
- Results from stakeholder interviews and workshops

Challenges

- Technical development
- Regulations
- Public opposition
- High energy consumption
- Land use and resource conflicts

Benefits

- Permanent CO_2 storage

Policy impacts

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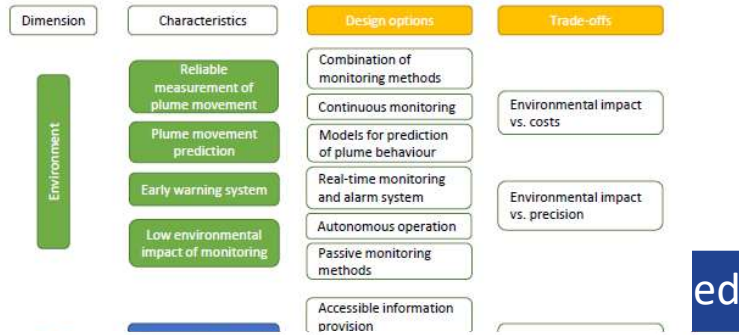
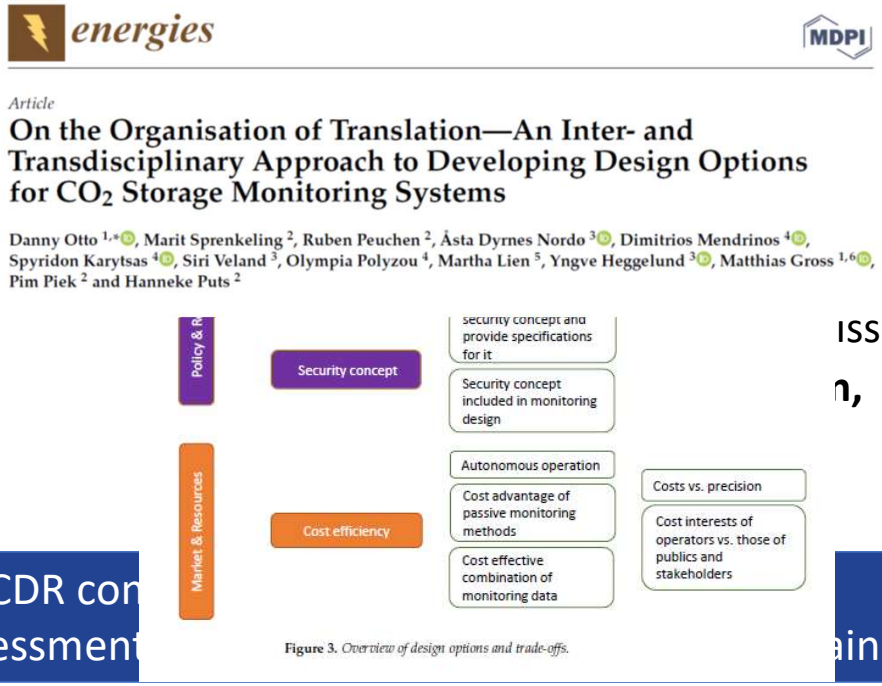
Digital Monitoring of CO2 storage projects

- What should a monitoring system look like → Able to identify design options for carbon storage monitoring
- Concerns about technical, environmental and politial risks of CCS
- Effect of monitoring on carbon storage perception are debated, indications for lowering concerns
- No one-size fits all solution – need for context specific debate and controversy





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What's next?

- UFZ Research on CCS and CDR con
  - ➢ Risk based technology assessment

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Thank You

For Your Attention

GET IN TOUCH

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