

MMV SUBGROUP: Final report summary

NSTA Technology Showcase on Carbon Storage MMV
NZTC

29.10.24



North Sea
Transition
Authority

STOREGDA



Carbon Capture &
Storage Association

HALLIBURTON



œUK

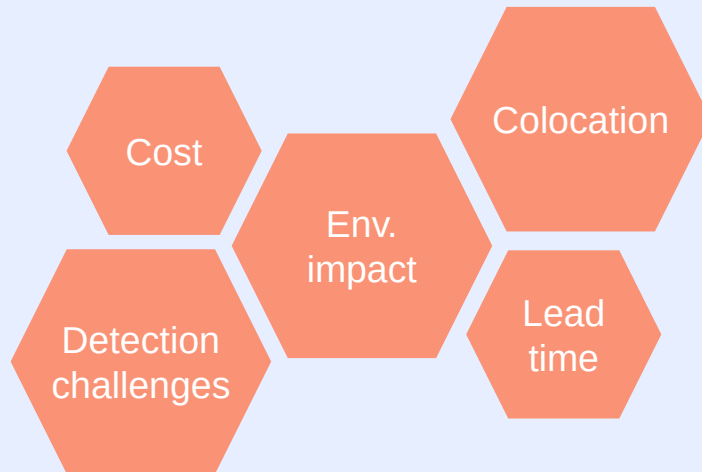


Project drivers and objectives

Today

Ambition

Repeat 3D (4D) seismic is routinely in core monitoring plans for CO₂ storage sites, but poses challenges:



Improved understanding of monitoring technologies that have the potential to reduce reliance on 4D seismic as a core monitoring tool, over the Track 1 and Track 2 stores.

Consider opportunities to improve resolution, reduce cost or environmental impact.



Enable viability testing of alternative technologies to reduce 4D challenges and maximise success of CCS projects.



Recommended Technologies Comparison

Technology	Cost	Areal coverage	Plume detection		Co-location flexibility	Time to detection	Technology readiness
Time-lapse surface gravity			Depleted field*	Saline aquifer*			
Time-lapse surface seismic (2D)			*				
Time-lapse S-DAS	??		*				
Time-lapse VSP-DAS							
Surface microseismic							

*Note the performance of time-lapse gravity vs 4D seismic regarding plume depends strongly on store type.

Legend: Performance relative to 4D seismic				
Much better	Slightly better	Equal	Slightly poorer	Much poorer

Recommended Technologies vs Store Options

Technology	Store Depth		Development Type		Seismic Response			Store Type	
	Shallow (~1000m)	Deep (~2000m)	Subsea	Platform	Good in store	Poor in store	Good in overburden	Saline aquifer	Depleted field
Time-lapse surface gravity									
Time-lapse surface seismic (2D)									
Time-lapse S-DAS									
Time-lapse VSP-DAS									
Surface microseismic									

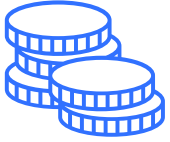
Legend: Ranking of the likely technology performance in various scenarios

Likely good

Performance possible but not
best suited

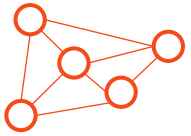
Likely poor

Opportunities



1) Cost sharing

- Acquiring surveys in collaboration with other seabed users
- Cost *and* environmental benefits



2) Microseismic monitoring networks

- Potential for networks around closely spaced stores, including use of existing sensors and infrastructure



3) Data sharing

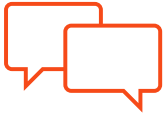
- Would facilitate faster learning and development
- Integral to leverage learnings from testing of any recommended technologies in this report

Future Recommendations



1) Desktop feasibility studies followed by field trials of the recommended technologies

- Multiple pathways – joint industry projects, field trials, regulator-led studies (e.g. MMV seismic report)
- Potential use of third-party infrastructure to reduce costs and create monitoring network(s)



2) Continue conversation on future monitoring technologies

- E.g. Installation of fibre in subsea wells, electromagnetic surveys
- Industry-wide engagement on non-seismic methods (regulator led?)



3) Establish a framework for the sharing of data

- Encourage engagement with NSTA's call for evidence on data sharing consultation
- Sharing of interpretation method to create aligned approach