

# Offshore Wind and CCUS Co- Location Forum

3rd Plenary Meeting

9<sup>th</sup> March 2022



# Agenda

1. **Introductions**
2. **Review actions / minutes from last meeting**
3. **Updates from active workstreams**
4. **Areas of focus / workstream actions**
5. **Next plenary & workstream meeting dates**

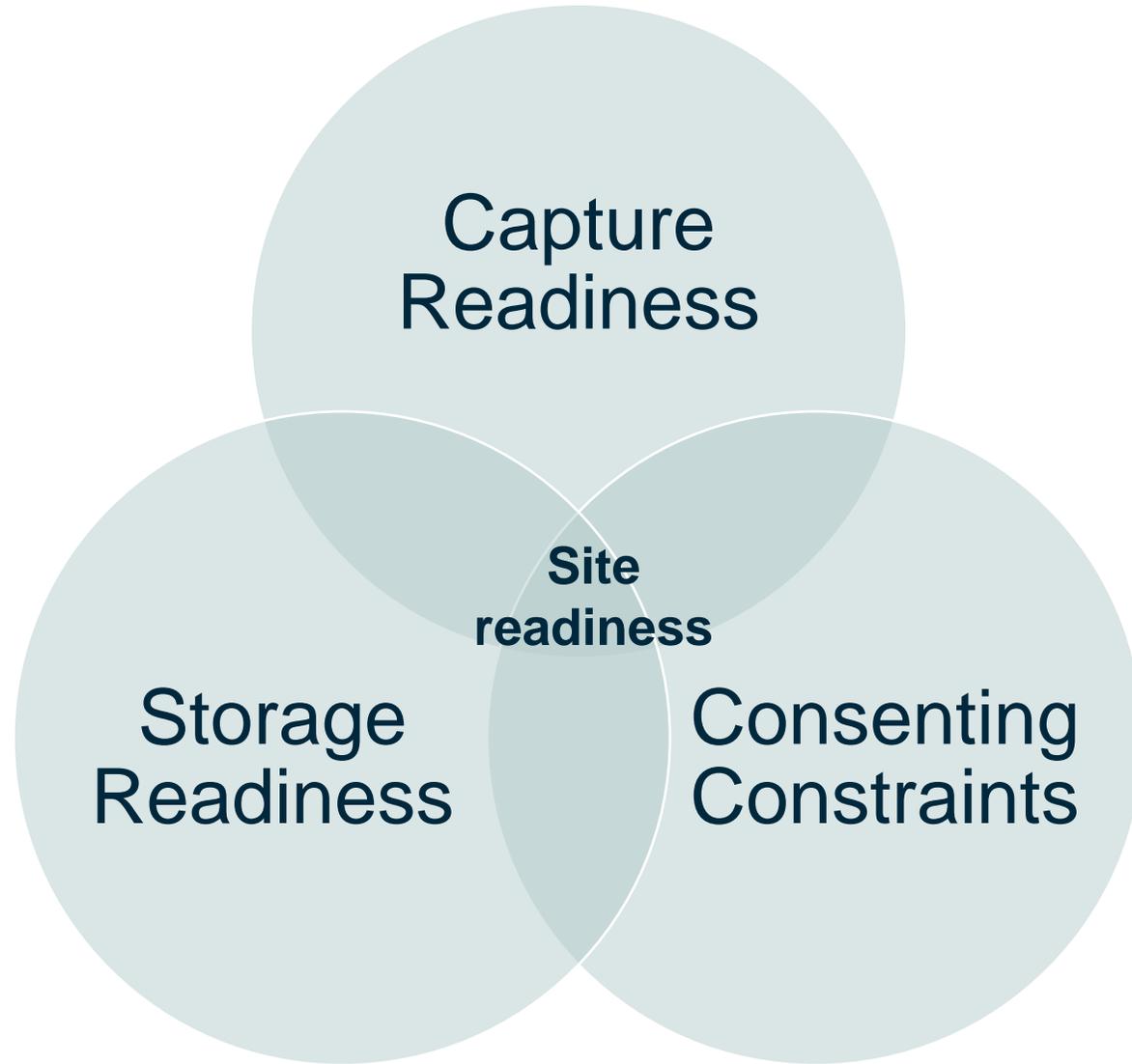
## Actions from Plenary #2

Item	List of Actions from Last Meeting	Action
1. 2. 3.	Pre-reading to be circulated ahead of next plenary session. Organise meeting with ETA to discuss PM resources for workstreams 7 – 10 Set up interim meetings with relevant parties surrounding WP4 before the next plenary session.	Chair
4. 5.	Suggest dates for next plenary meeting to be held in February, agree and send invite. Updated Communication Policy to be circulated with the minutes for review	Secretary
6.	TCE to update the Communications Plan to state that working groups should meet and update the forum before plenary sessions.	TCE
7.	Set up a workstream 4B and 5B for the CES to actively reach out and discuss workstream activities with Marine Scotland.	CES & Chair
8.	OGA to make the forum aware when the slides on spatial co-location project overview are available.	OGA
9.	Forum members to consider if there are any wind farms or operators that would be willing to host a trial of gathering seismic data next to a wind farm.	All

# OW/CCUS Co-Location Forum – Workstreams (Revised)

CLF Plan	3Q21	4Q21	1Q22	2Q22	3Q22	4Q22	1Q23	2Q23	extend CLF?
plenary meetings	Aug	Nov	Mar	Jun	Sep	Dec	Mar	June	
1-CLF									
2-Operational alignment									
3-Development liability									
4-Spatial characterisation		Plan	Status			Report			
5-Spatial planning (follows 4)						Plan			
6-MMV seismic		Plan	Status			Report			
7-OW/CS simops				Plan			Report		
8-Wider impact					Plan			Report	
9-Simops opportunities				Plan			Report		
10-Geomech/brine impacts					Plan			Report	
11-Stakeholder engagement		Plan	Status						

## CLF#4 Spatial Characterisation (Plenary #3)





# CLF#4 Spatial Characterisation (plenary #3)

- OGA-TCE-CES-BEIS working closely on spatial evidence
- OGA-TCE-CES are working towards a joint statement
- aligned licensing/leasing process



## Seismic Monitoring & Co-Location Report **Completed**

Summary: CCS monitoring in constrained environment

## Fluid substitution rock physics **In progress**

Summary: desk-based study focused on the fundamental question of the applicability of OBS 4D seismic to the imaging and monitoring of CO<sub>2</sub> injection in different subsurface formations. The study will also review international experience of 4D seismic for CO<sub>2</sub> monitoring, as well as ongoing geological research on the subject.

## OBN Technology Current State Assessment **In progress**

Summary: desk-based study to review OB technology applications and their portability to CO<sub>2</sub> storage monitoring to understand the viability of Ocean Bottom Node seismic as a valid alternative to conventional towed-streamer seismic, creating distinct advantages in areas where spatial co-location (with windfarms and/or other surface users) may be an issue.

## Windfarm noise study **About to start**

Summary: desk-based literature review to characterise the expected behaviour of seismic waves (frequency, amplitude and propagation) from onshore and offshore turbines. Also of relevance is the geological setting, wind conditions and turbine type and size to provide an understanding of anticipated noise condition.



OGA funded

### Pre-existing Co-Location report: Expected Release April 2022

- Final Internal review completed. Edits completed to match OGA feedback
- Roll out to IAGC (International Association of Geophysical Contractors) rebranded as EnerGeo 15/2/22
- OFFER to co-location forum: provide tailored presentation/ discussion

### • Rock Physics Study/ IKON: on target for end Mar 22

- Expanded scope & budget from 4 to 5 wells, to cover all main CCS areas
  - NOCS: Sleipner well substituted. Poor quality data on original released well: Courtesy NOCS Diskos
  - UKCS- SNS: V-Fields: data (RokDok project) supplied courtesy Harbour.
  - UKCS- SNS: Endurance, data supplied courtesy BP
  - UKCS: Liverpool Bay: Data downloaded from OGA operated National Data repository (NDR), ENI aware
  - UKCS: Moray Firth: Goldeneye: data supplied courtesy of Storegga/ Shell
- Petrophysical analysis underway on all wells.
- IKON providing experience on CO<sup>2</sup> fluid substitution scope & software to interrogate results

OGA funded

Miocene  
Permian  
Triassic  
Triassic  
Cretaceous

### • OBN Technology/ Graham Lilley on target for end Mar 22

- Comparative costings for seismic streamer and OBN (Ocean Bottom Node) acquisition
- Reviewing cost reduction options
- Testing by conducting interviews with ~30 acquisition companies, CCS and windfarm operators

OGA funded

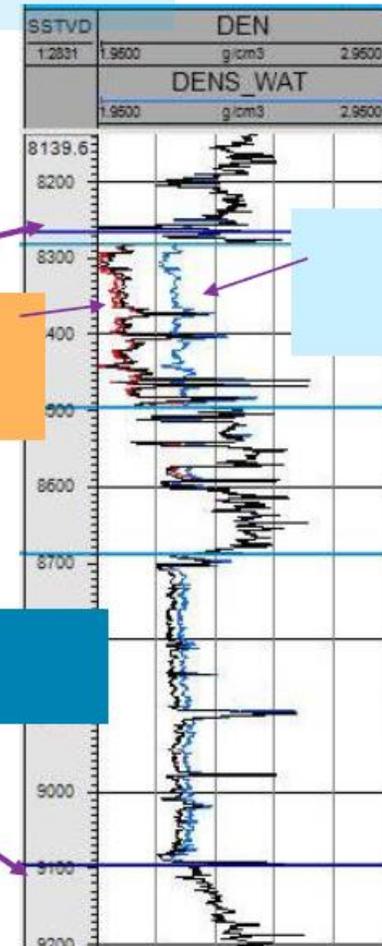
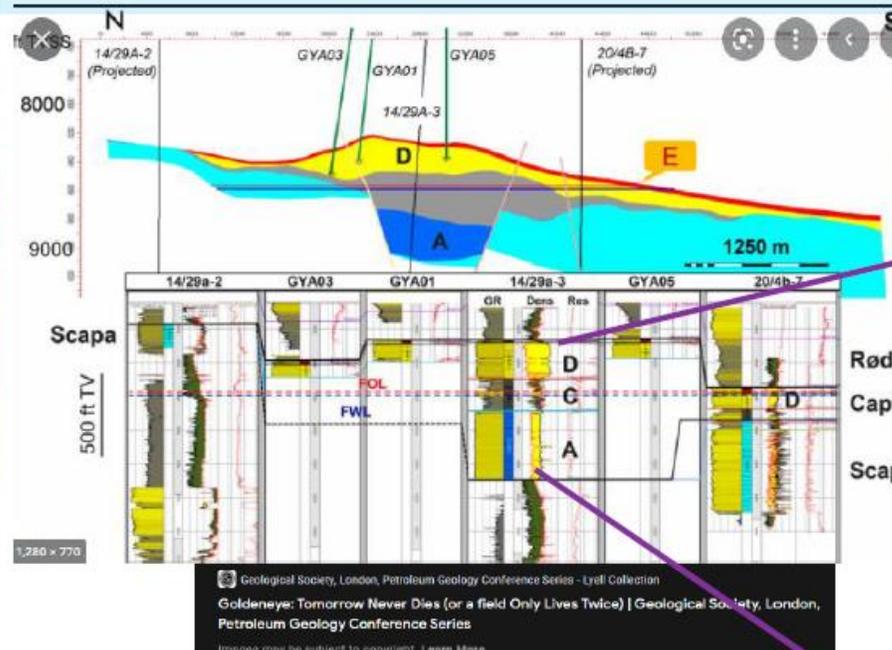
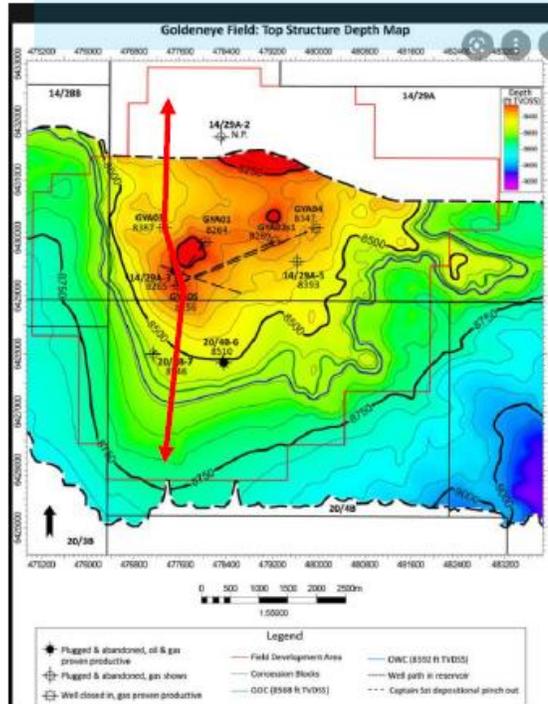
### • Windfarm noise/ Heriot Watt University: expected End June 22

- Literature review about to start (~40 days)
- Real data analysis (~5 days)
  - Knox/Lowry 2D seismic supplied courtesy Spirit energy
  - Full stack migrations loaded to NDR/ Reasonable imaging for HR seismic
  - 16 lines pre-stack “shot” data adjacent to turbines, supplied to Post Doc

TCE Funded



# Methane to water substitution, indicates predicted size of seismic monitoring signal



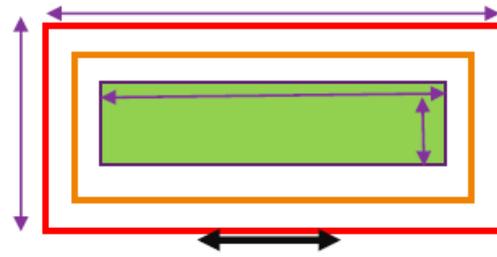
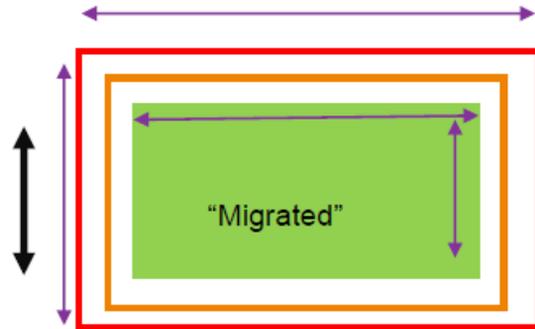
Geological Society, London, Memoirs - Lyell Collection  
The Goldeneye Field, Blocks 14/29a and 20/4b, UK North Sea | Geological Society, London, Memoirs

# OBN vs Streamer costing

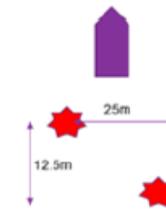


- Major concern: OBN is the cost which can be ~5x that of a streamer survey
- Test cost models out with 2 typical scenarios

OBN

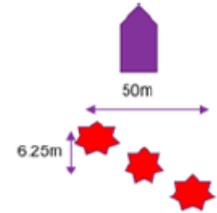


OBN Shooting Direction  
50m shot lines. Flip flop 25m x 25m (each side 25m in line, actual shot every 12.5m).

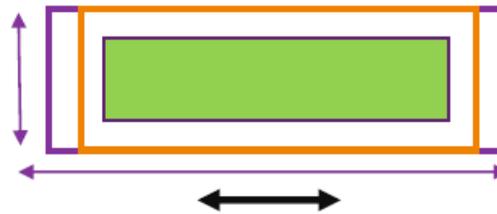
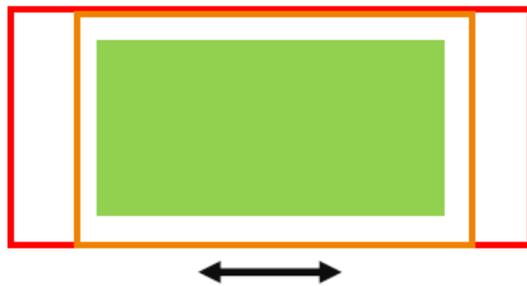


Or >>

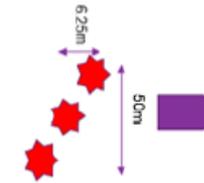
OBN Shooting Direction  
75m shot lines. Flip flop maintains 25m x 25m for each source



Streamer



Streamer Shooting Direction  
300m shot lines as opposed to 200m for unblended



## Cost reduction options

- 3 shots vs conventional 2 ("flip-flop")
- Wider node separation

Key: Actual shot area  Full Fold area  Fully imaged reservoir target area

# Windfarm Seismic Noise

