

# Poseidon

## Lessons learned from early injection

8<sup>th</sup> International Workshop on Offshore Geologic CO<sub>2</sub> Storage

20-21 April 2026

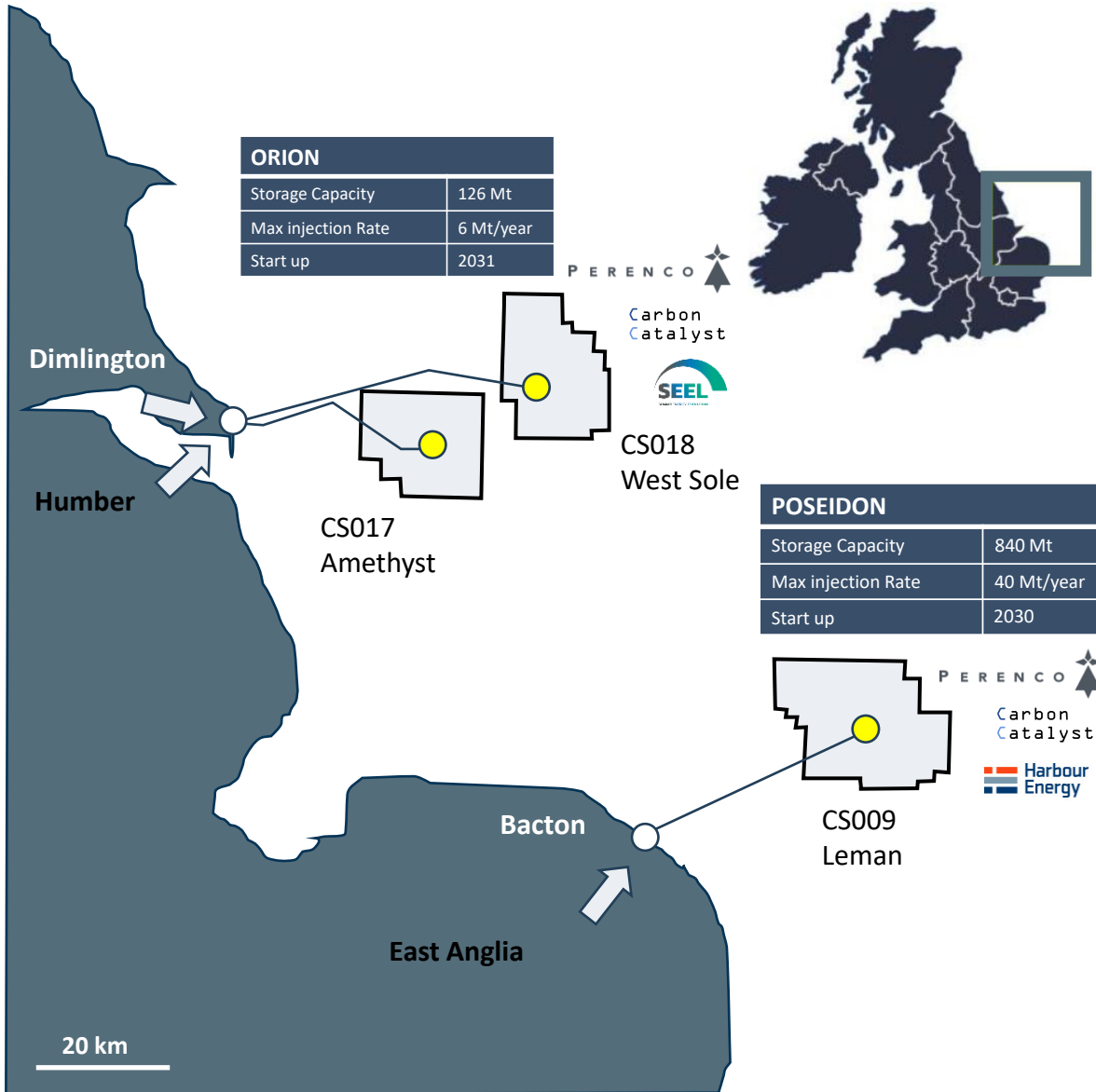
Bergen, Norway



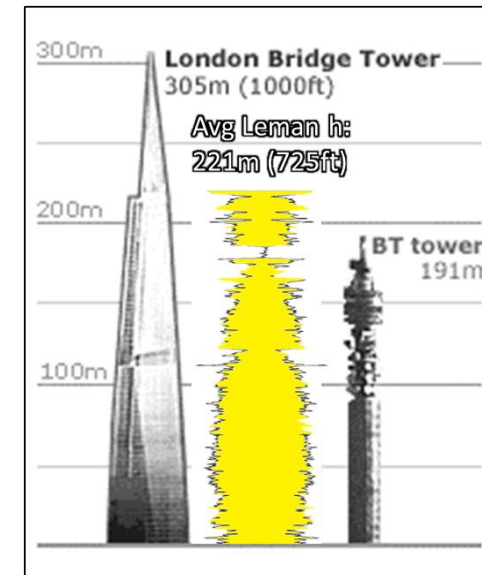
Carbon  
Catalyst



Poseidon CO<sub>2</sub> injection test (Mar 2025)



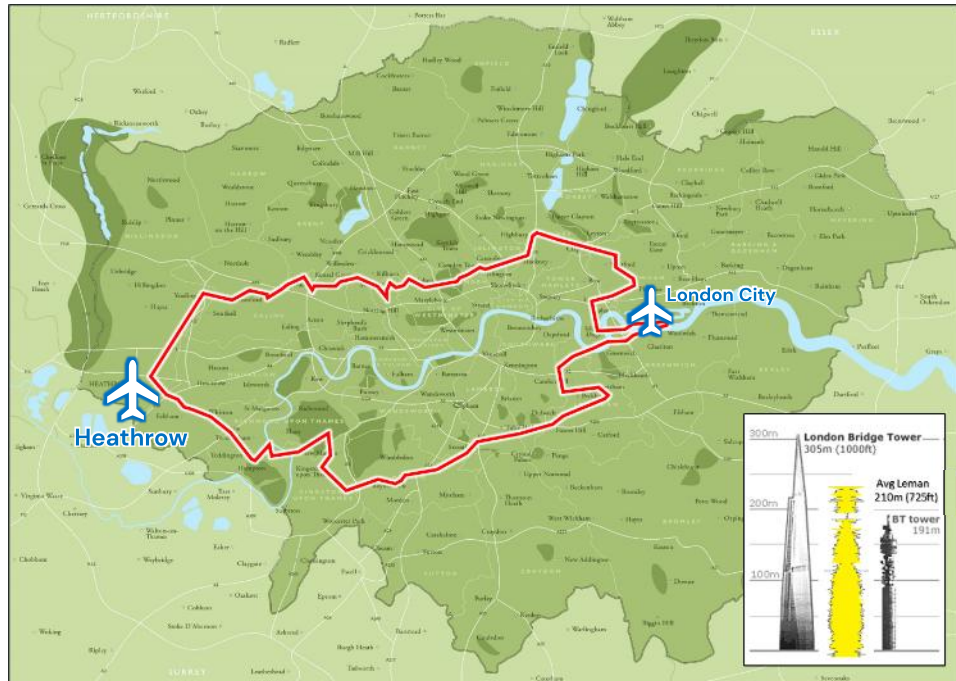
- Three UK SNS CCS licences awarded in 2023
- CCS strategy is to re-use extensive Perenco-owned infrastructure and depleted hydrocarbon fields for CO<sub>2</sub> storage
- Poseidon Store focuses on the Leman gas field
  - UK largest gas field ~ 14.5 Tcf
  - Compartmentalised – enabling store to be developed segment by segment
  - Thick reservoir (~220 m) & caprock (~ 650 m)
  - Ultra depleted reservoir pressure (down to ~12bar)



# The Leman Advantage – A World Class Store

## Storage centred on Leman gas field – SNS largest legacy gas field from 14.5 Tcf to ~1 GT CO<sub>2</sub> capacity

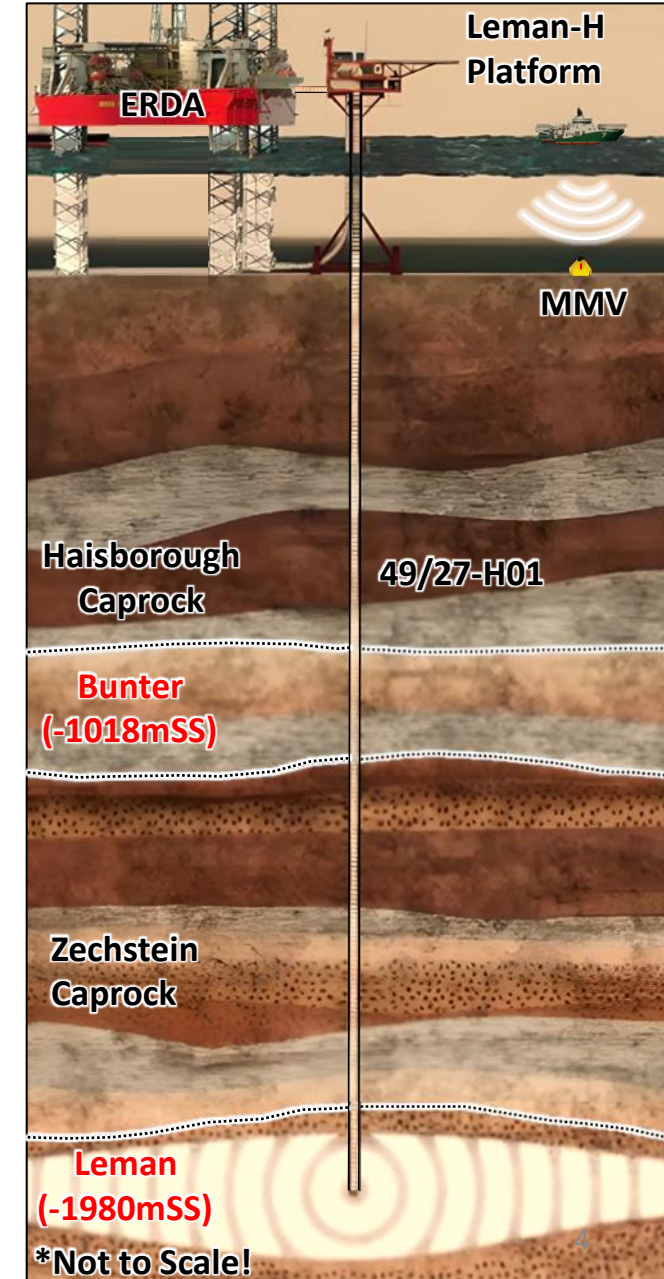
- Producing 2.0 Bcfpd in late 1970s (42% UK gas demand)
- The field encompasses **15 platforms** & **200 wells** that can be repurposed for CCS
- **Massive, highly compartmentalised reservoir** – enabling store to be developed segment by segment.
- Ultra-depleted gas reservoir with **significant historical data set**.



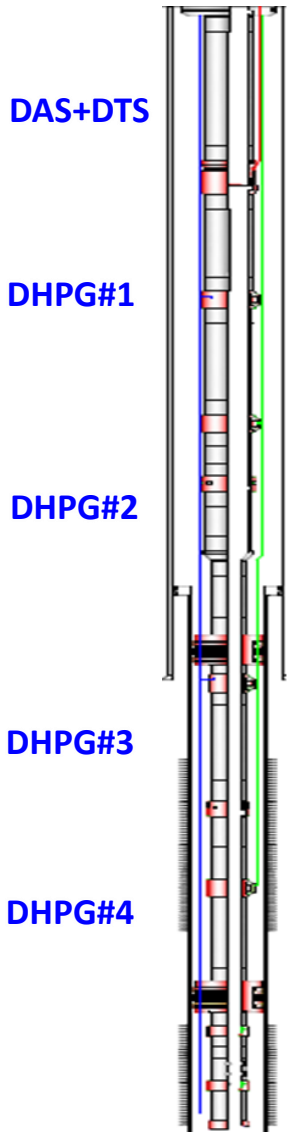
# Project Poseidon CO<sub>2</sub> Injection Test

## A key early enabler for commercial scale injection

- Addresses the **current lack of UKCS data** on the viability of depleted gas reservoirs for CO<sub>2</sub> storage.
- Provides conclusive evidence for the Poseidon JV and the wider industry on the **suitability** of such reservoirs for **commercial CCS operations**.
- Confirms the potential to **repurpose existing infrastructure**, including topsides and well completions, enabling cost-effective development.
- Introduces and **validates new MMV technologies** to track CO<sub>2</sub> behaviour and enhance reservoir modelling.
- Demonstrates reliable operability of CO<sub>2</sub> injection, **confirming Mtpa capacity** per well and ability to achieve commercial injection rates.

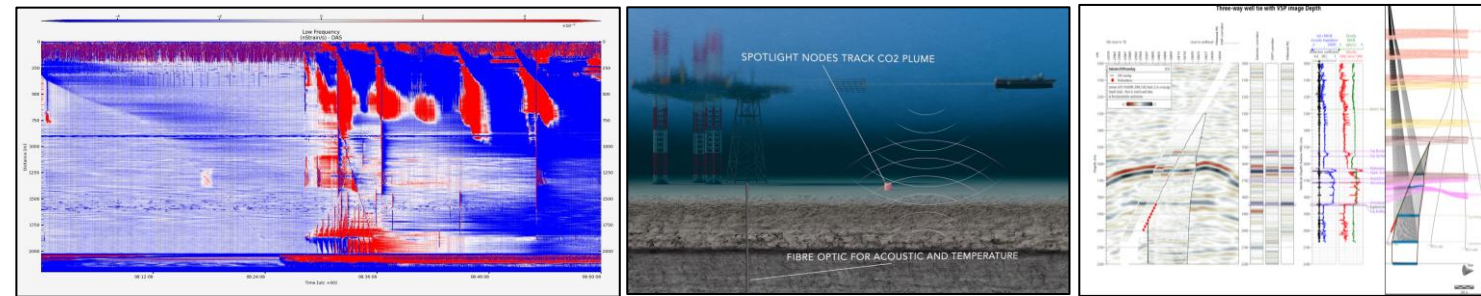
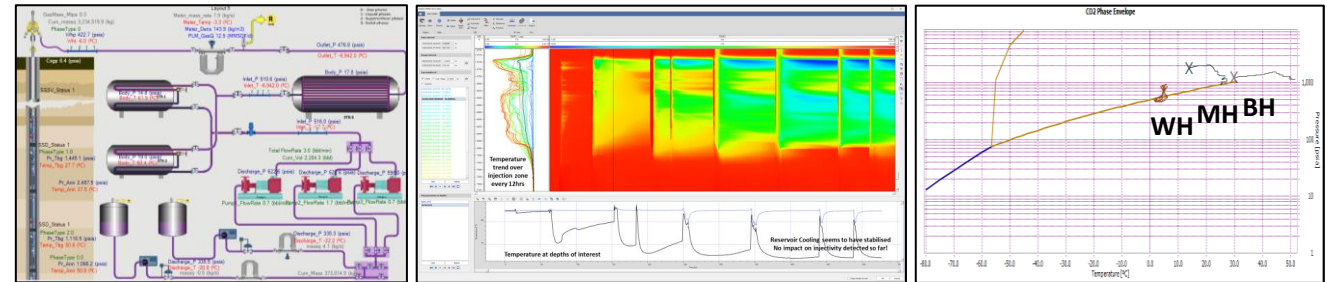


# Injection Test Data Acquisition



- 60 MEG / 40 water as **packer fluid**
- 5 ½" to 3 ½" 13CR Tubing
- SCSSV non-elastomeric
- Annular & tubing optical gauges
- Annular & tubing quartz gauges
- Optical fiber for VSP & temperature monitoring
- 7" x 3.5" cut-to-release retrievable packers
- Annular & tubing optical gauges
- SSD non-elastomeric for zone selectivity
- Annular & tubing quartz gauges
- 7" x 3.5" cut-to-release retrievable packers

- Robust Data Acquisition design from surface to downhole to frame future designs and operations
- Fiber Optic cable from surface to bottom reservoir (DTS & DAS)
- P&T gauge (electrical and optical) at different points along the well to understand CO<sub>2</sub> phase behaviour during injection
- Acquire DAS-VSP and Spot Seismic to understand the different MMV capabilities
- Recorded Passive Seismic during the whole injection test period



# CO<sub>2</sub> Injection Test Execution Strategy



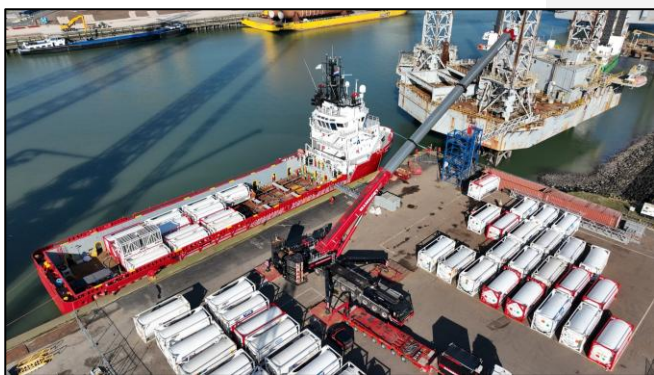
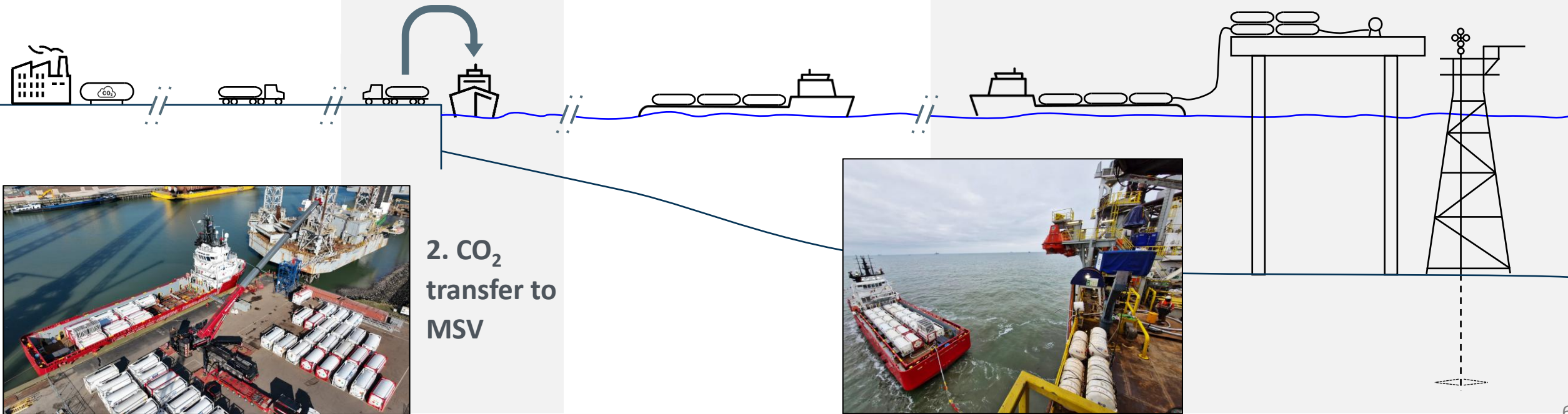
1. CO<sub>2</sub> supply



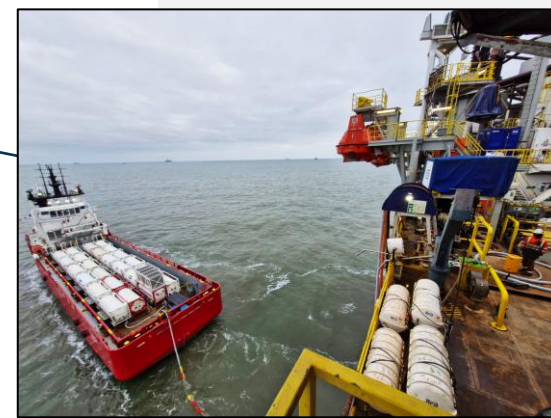
3. CO<sub>2</sub> shipping to Leman 27H

- CO<sub>2</sub> shipping to rig via MSV vessel
- **3** months operations starting in February 2025
- **10** offshore LCO<sub>2</sub> transfers in 43 days
- **15** CO<sub>2</sub> injection cycles
- **3,500** tonnes on CO<sub>2</sub> injected into the well

4. CO<sub>2</sub> transfer to ERDA



2. CO<sub>2</sub> transfer to MSV





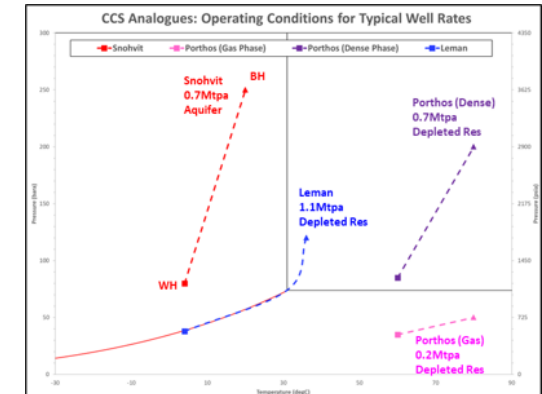
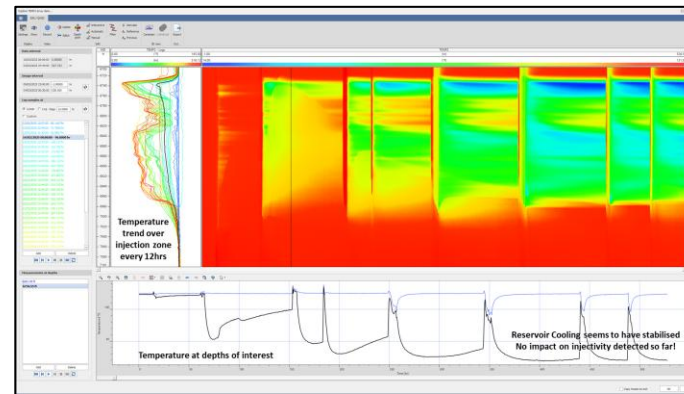
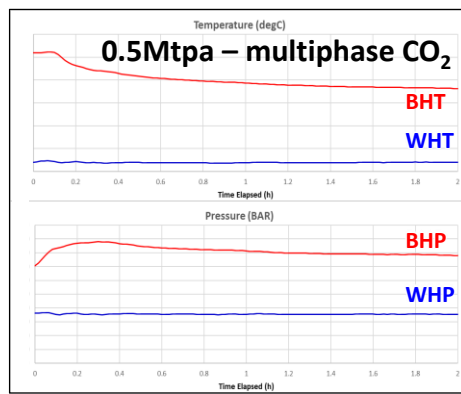
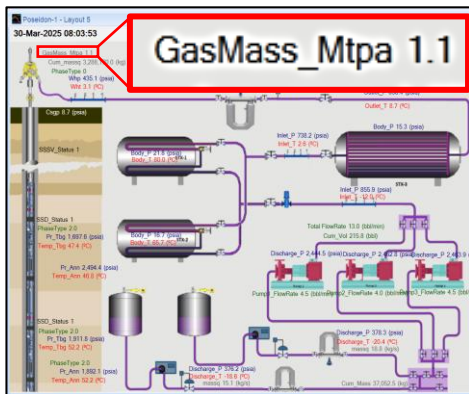
**Poseidon CO<sub>2</sub> bunkering operations – March 2025**



Poseidon CO<sub>2</sub> injection test - March 2025

# Poseidon CO<sub>2</sub> Injection Test: Technical lessons learnt

- **Multiphase injection** is not problematic:
  - Stable flow & pressure on surface and at reservoir level achieving up to **1.1Mtpa**
  - Multiphase injection offer more **cost-effective development options** (low WHP & WHT)
- **No clear advantage to liquid-phase only.** Injection with downhole choke → colder temperatures at reservoir level.
- **Lowest surface temperatures down to -12.5°C only at highest rates**
- Frequent start-up/shut-down cycles worsens reservoir cooling BUT lowest average injection interval temperature is +13°C (above hydrate appearance temperatures)
- Wellbore and seismic MMV techniques tested and will become the **backbone of the future MMV plan**



# Poseidon CO<sub>2</sub> Injection Test: An enabler for commercial operations

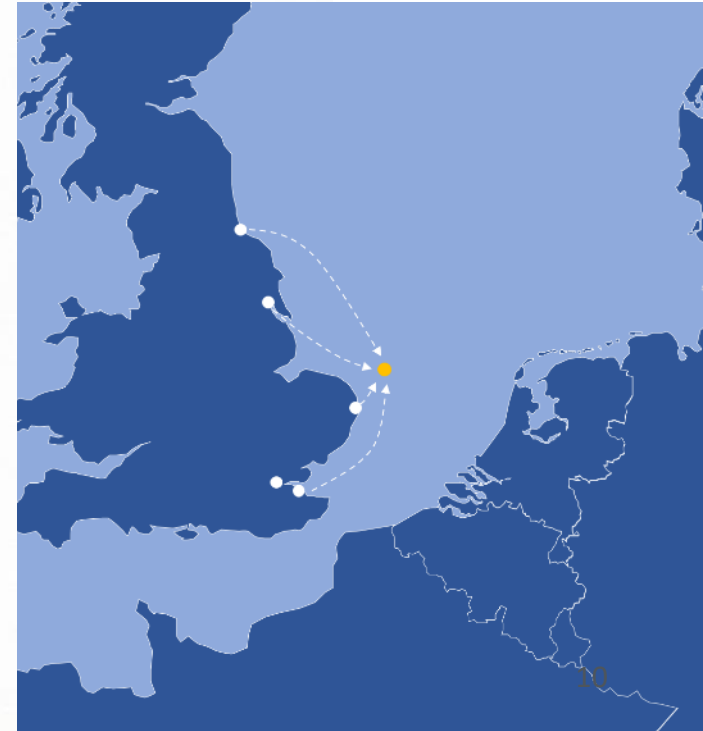
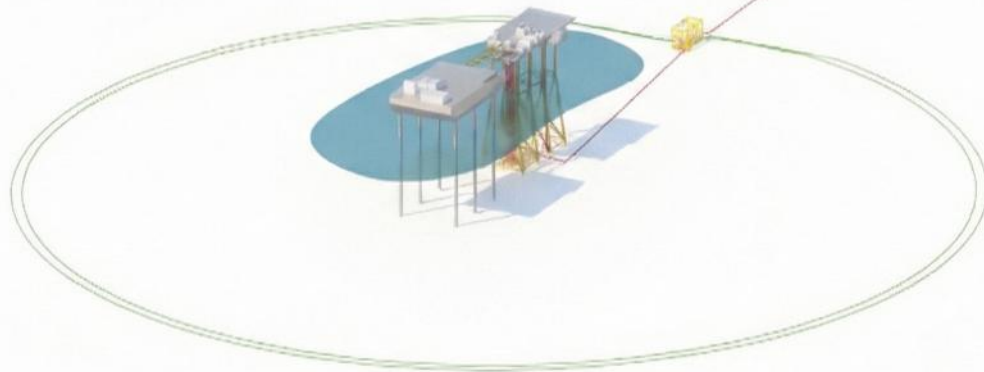
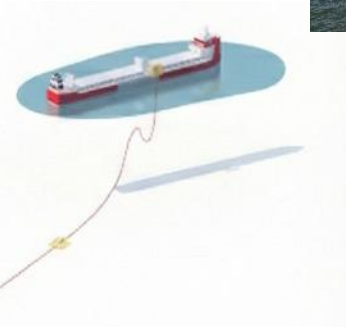
## A unique dataset enabling confident scale-up to commercial operations

- Test achieved over **1 Mtpa per well** – Up to 2 Mtpa per well expected
- Confirmation of **reduced heating requirements** – less CAPEX, OPEX and CO<sub>2</sub> emissions
- Acquired world class dataset for reservoir and flow assurance **models validation**



## Poseidon Phase 1 Development

- Up to 1.5 Mtpa initial phase, CO<sub>2</sub> delivered by 7,500 tonne ship carriers
- Convert 2 wells to CO<sub>2</sub> injectors from 1 existing platform (7 wells available)
- Offloading infrastructure offshore at Leman field
- Zero emission heating loops



PERENCO



Carbon Catalyst



ERDA

Thank You!