



North Sea
Transition
Authority



United Kingdom

UK CCS Regulation and Activities

Western Australia FEnEx CRC CCS Workshop

Dr Nick Richardson

Head of Exploration & New Ventures, NSTA

13th March 2023

© NSTA 2022

This presentation is for illustrative purposes only. The NSTA makes no representations or warranties, express or implied, regarding the quality, completeness or accuracy of the information contained herein. All and any such responsibility and liability is expressly disclaimed. The NSTA does not provide endorsements or investment recommendations.

The North Sea Transition Authority is the business name for the Oil & Gas Authority, a limited company registered in England and Wales with registered number 09666504 and VAT registered number 249433979. Our registered office is at 21 Bloomsbury Street, London, United Kingdom, WC1B 3HF.

The NSTA's role in CCS

NSTA CCS role

Licensing and permitting authority for offshore carbon storage

Stewardship of issued carbon storage licences

Assess and understand **UKCS regional carbon storage** in support of CCS build out and spatial planning

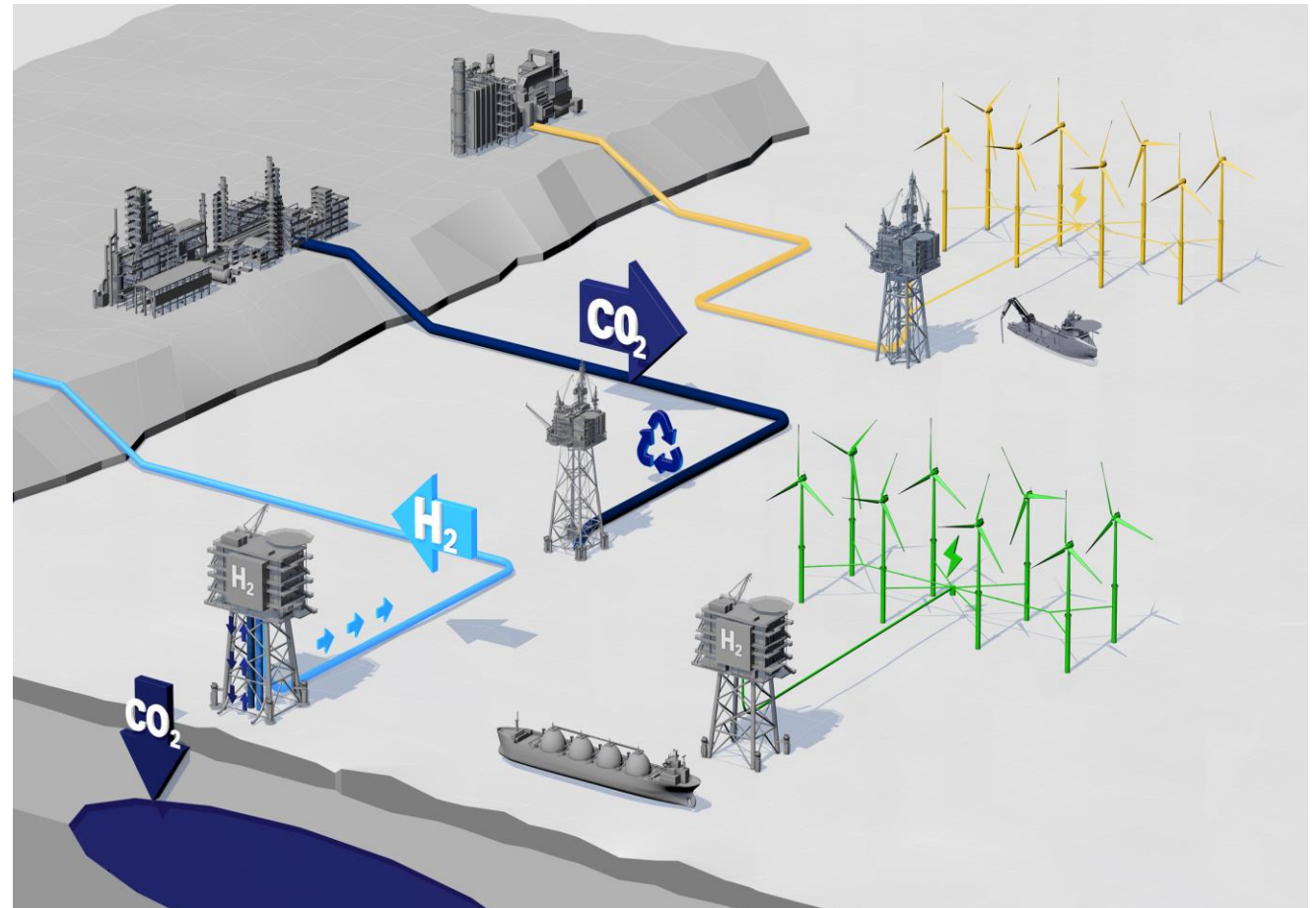
Encourage **re-use of infrastructure** as part of NSTA Cessation of Production process

Consultee to OPRED on operators' **decommissioning** plans

Regulatory coordination, including on co-location

Exploring role of CO₂ **EOR/EGR**

Maintain carbon storage **public register**



78
GtCO₂

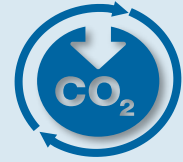
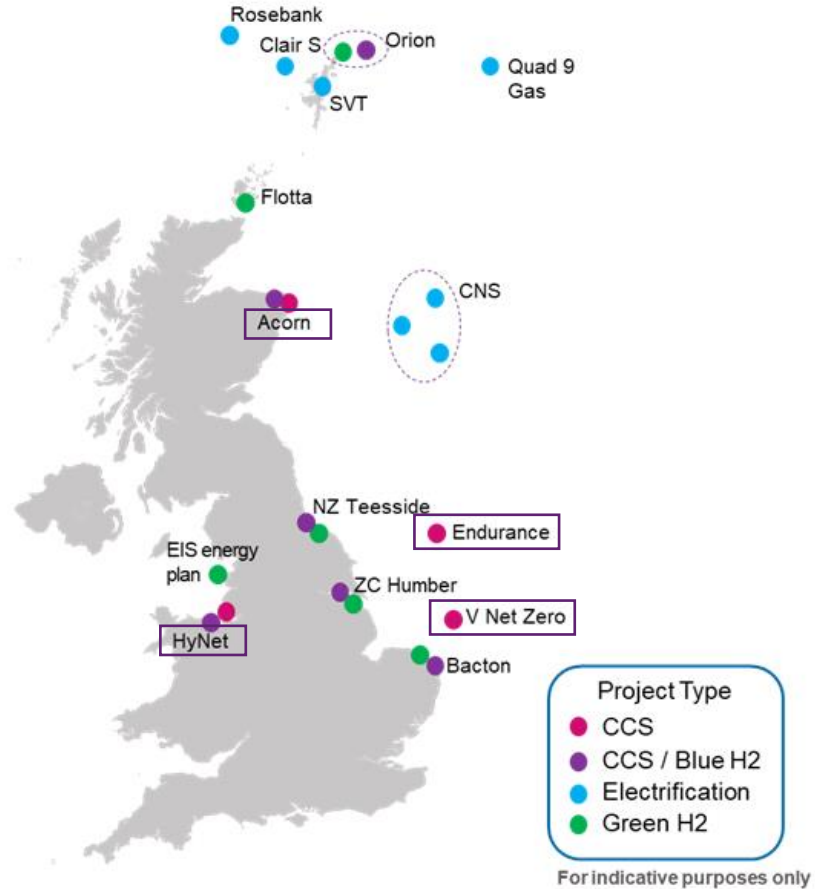
total UKCS CO₂ storage
resource estimate

75-180
MtCO₂

CCC estimate of annual
requirement in 2050

30
MtCO₂

UK govt 2030 annual
target (Ten Point Plan)
4+ commercial projects
Cumulative capex £8bn



Progress

As of March 2023, the NSTA

- has **awarded 5 carbon storage licences**, to Storegga (Acorn, CS003, Dec 2018), ENI UK Ltd (HyNet, CS004, October 2020), Harbour V Net Zero (VNetZero/Viking CCS, CS005, October 2021), BP-Equinor (Endurance Extension, CS006/7, May 2022) and **extended duration of one carbon storage licence** (Endurance/East Coast Cluster, CS001)
- is **stewarding 6 carbon storage** licences towards storage permit application and first CO₂ injection

NEP East Coast Cluster, Teesside



HyNet, North West England



Acorn, St Fergus, Scotland



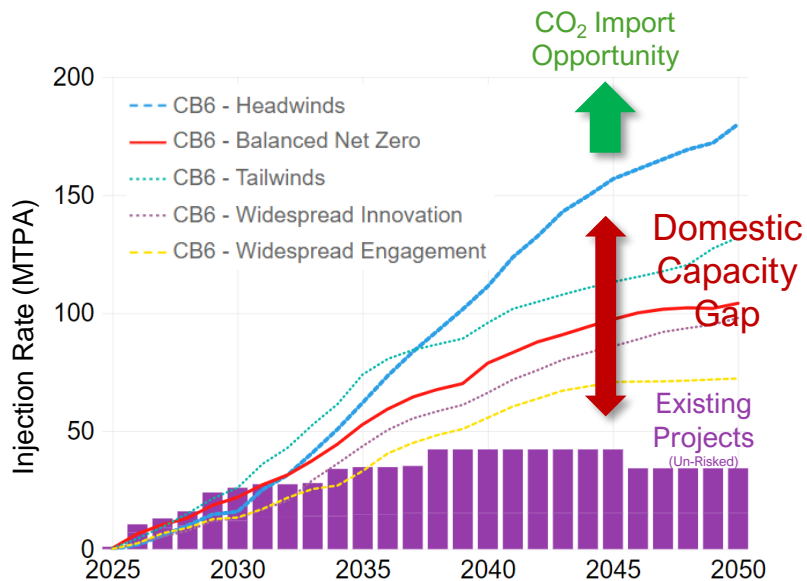
Viking CCS, Immingham



Meeting CB6 targets and the 1st Carbon Storage Round

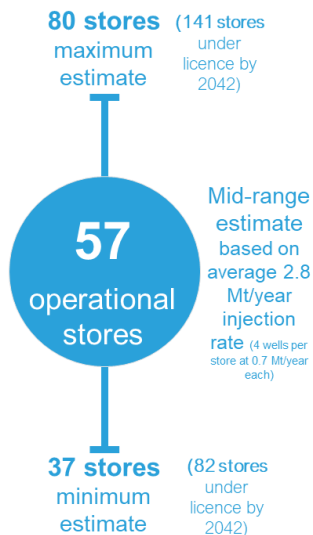


North Sea Transition Authority



Note that existing projects represent a mix of depleted field and aquifer stores

How many stores may we need?



Headwinds Scenario
Domestic Requirement
180 Mt/year in 2050
(Carbon Budget 6)



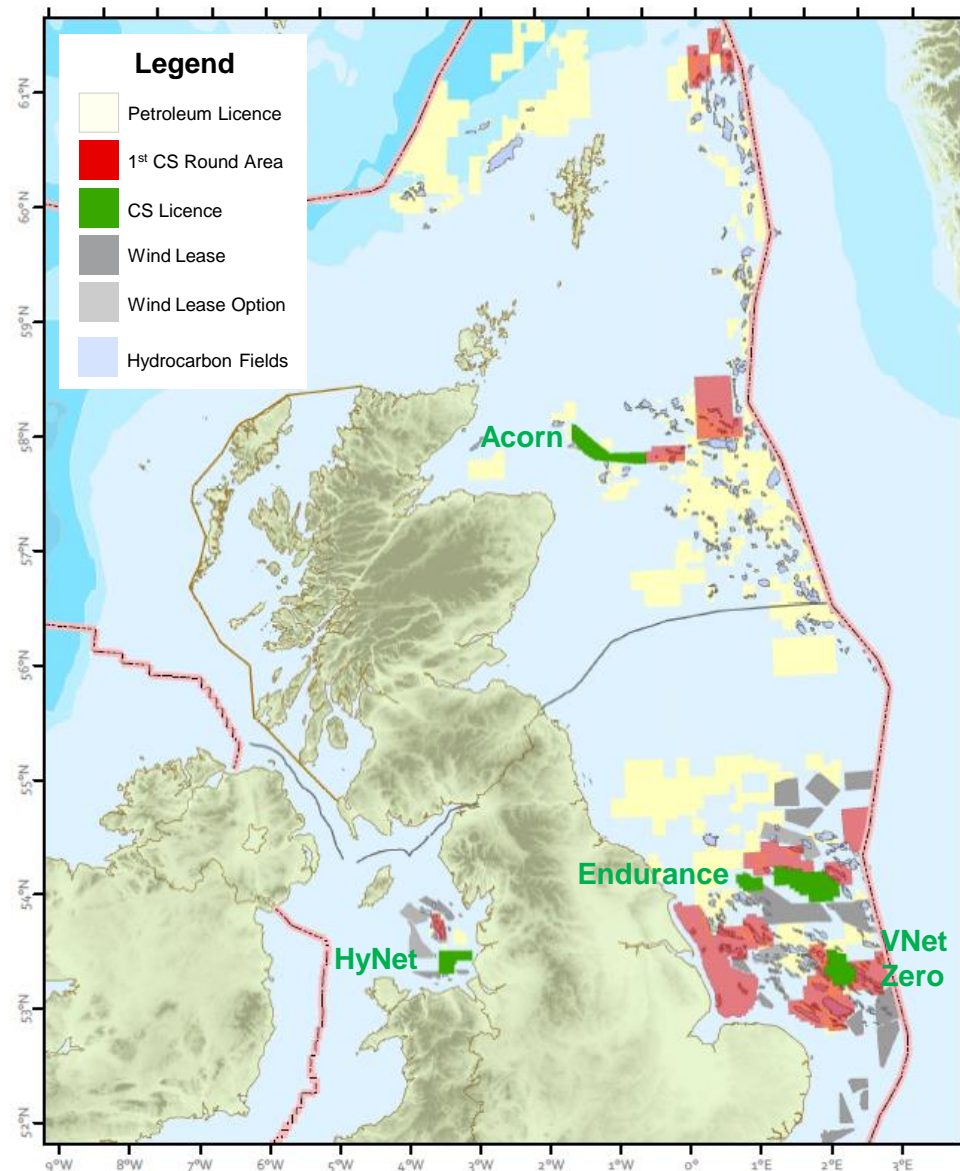
- Appraisal timescales likely to be 6 to 10+ years from licence award to first injection

To keep on track, NSTA launched the UK's First Carbon Storage Licence Round

- Open – 14th June 2022
- Closed - 13th September 2022

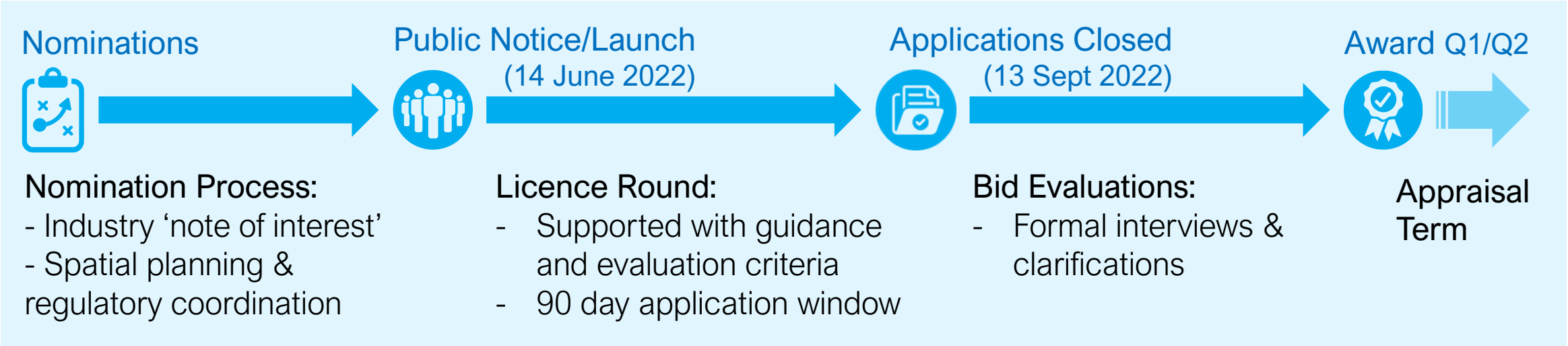
Total Applications 26
Areas Applied for **13**
(all areas offered)
SNS Heavily Competed
(7 out of 8 areas)
NNS, CNS, EIS – No Areas Competed

Awards due around end Q1 '23



Further Regular Licence Rounds will be required to fill the Storage Capacity Gap

Process



Lease/Licence Framework



North Sea Transition Authority



On Storage Licence Application: Set out work required to sufficiently **characterise and assess the Storage Complex and Surrounding Area** in accordance with Criteria set out in Annex 1 of Directive 2009/31/EC

- On Storage Permit Application:**
- Storage Permit Plan (Full characterisation & Assessment)
 - Monitoring Plan (including baseline seismic surveys)
 - Corrective Measures Plan
 - Provisional Post Closure Plan
 - Financial Security
 - Operator Competence (Technical, Environmental and Financial)
 - Development & Training Programme

During Storage Operations:

- Five-Year Permit Review Cycle

- Near Post-Closure:**
- Proposed Post Closure Plan

- Post-Closure (20-Years):**
- Monitoring
 - Reporting
 - Corrective Measures
 - Maintain Financial Security



Guidance on the application for a Carbon Dioxide Appraisal and Storage Licence

Version: February 2023 Rev 1.1

Date of publication 29/04/2022



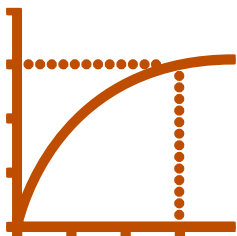
Guidance on Applications for a Carbon Storage Permit

December 2022

Evaluation of UK Storage Portfolio



465 Hydrocarbon
Fields Screened &
Injection Profiles
Generated



Stochastic
Volume &
Injection Rate
Estimation

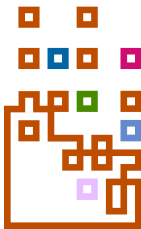


Storage
Portfolio
Scenario
Outcomes

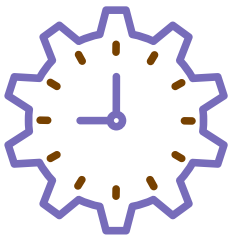
Key Messages



Volume Gap
Many more stores are
required to achieve net
zero targets



Back-up Options
A diverse portfolio will reduce
uncertainty and increase
confidence



**Appraisal Activity Must
Accelerate**
To realistically impact
storage capacity from
2030s onwards

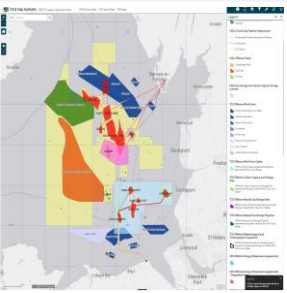


Spatial Planning
Up-front appraisal and
baseline surveying
supports spatial planning
and co-existence

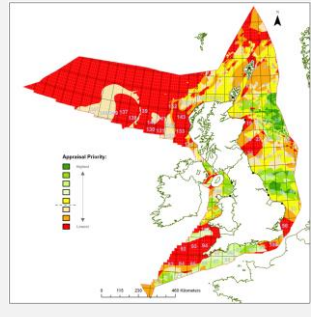
Project SPICE

SPatial Integrated Carbon Evaluation

Data Mapping

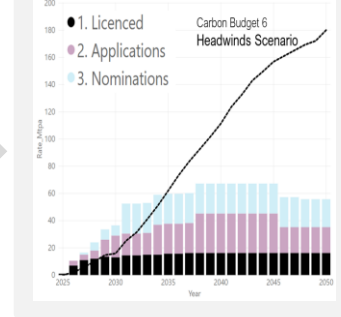


Subsurface Play Elements

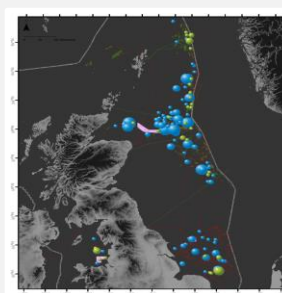


'Unconstrained' Maps

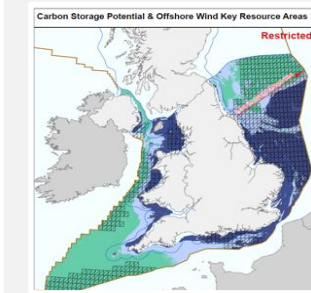
Quantitative Assessment



CB6 Storage Portfolio Build

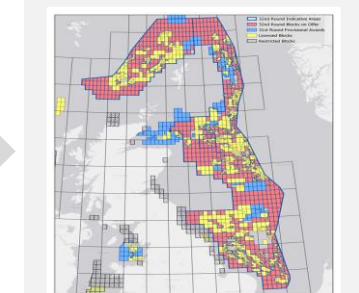


Co-Location Prioritisation



'Constrained' Maps

Licensing/Leasing Strategic Delivery



Stewardship

Phase 1

Data Collection & Analysis

Phase 2

Insights

Actions & Tactics
+ Strategy

OBJECTIVE

1.5°C Limit
Net Zero 2050

Strategy

6th Carbon Budget
Energy White Paper
10 Point Plan, T&S Strategy

Actions & Tactics

Industrial Clusters GSP, UK-ETS
Licensing/Leasing Financial Security
Stewardship Decom Policy, ERR

Insights

Project SPICE (Phase 2)
Risk Register/Checklist
Co-Location Studies

Analysis

Project SPICE (Phase 1)
Infrastructure Re-Use
Technology Plans, incl. MMV
Supply Chain Review
Legacy Well Integrity Analysis
Rock Physics Study

Data Collection

NDR Data Reporting (Wells, Seismic, Pipelines, Facilities)
GIS Maps (Oil/Gas, CCS, Wind, Environmental, Shipping/Aviation, Networks, etc)

Insights

Data
Collection
& Analysis

Phase 2

Phase 1

DETAIL

Storage Site

Storage Complex

Storage Play

Hydraulic System

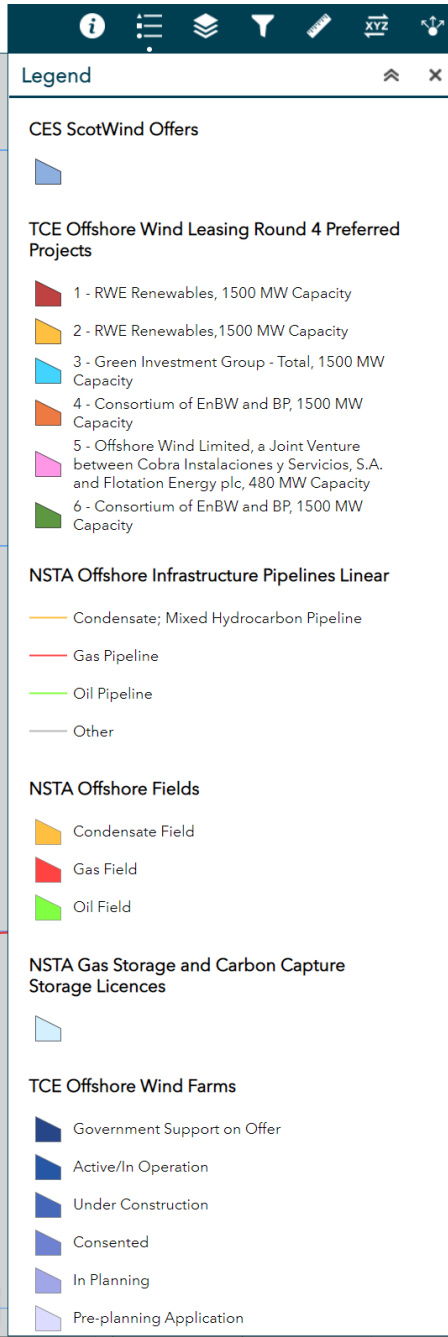
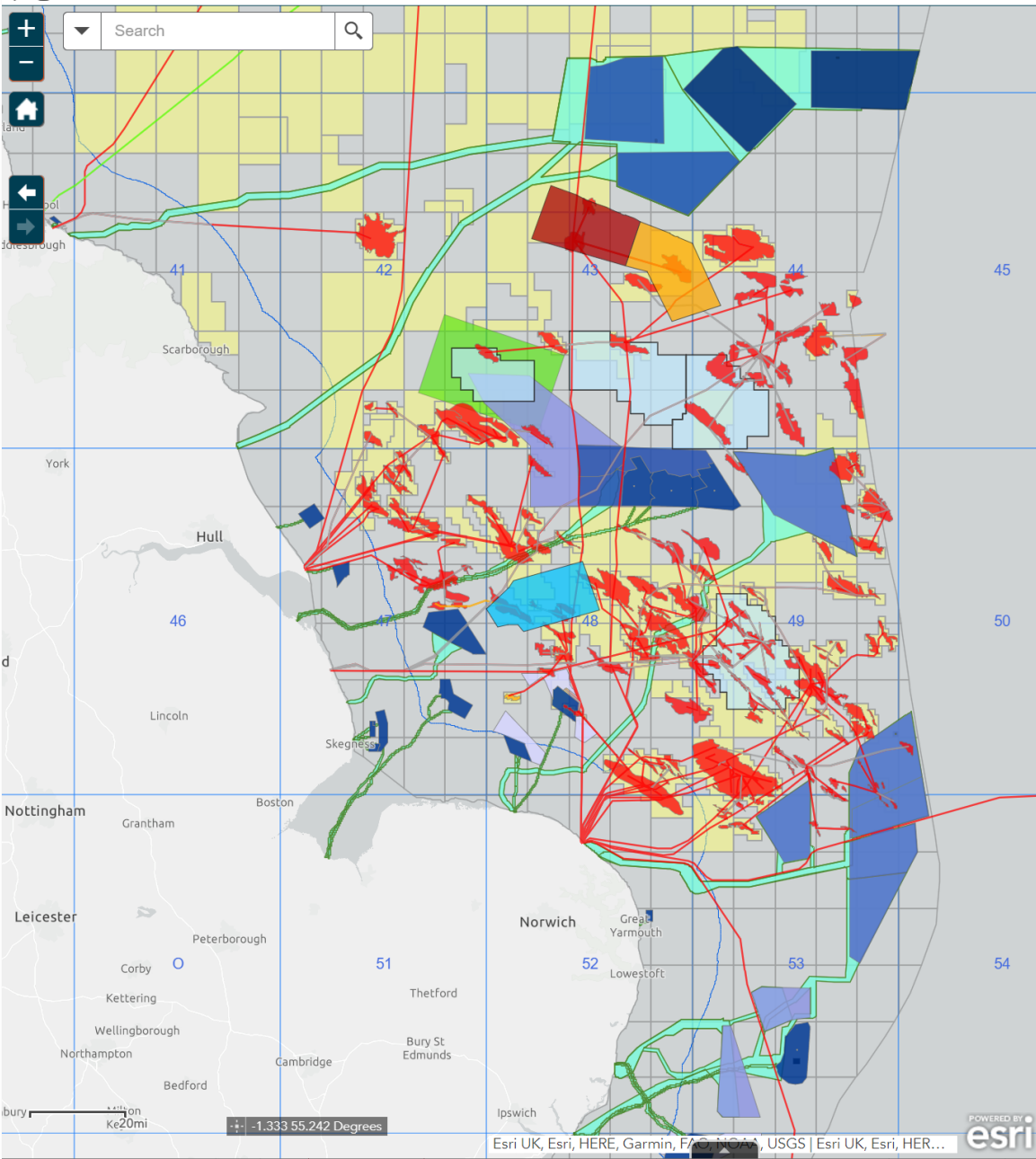
Depleted
Fields

Saline Aquifers

Structural/
Stratigraphic

Migration
Assisted

Increasing data and analysis is required to build a viable portfolio of potential storage sites. This portfolio needs to be created in the context of overall net zero targets and constraints and opportunities in the use of offshore space



Spatial Planning and Co-Location

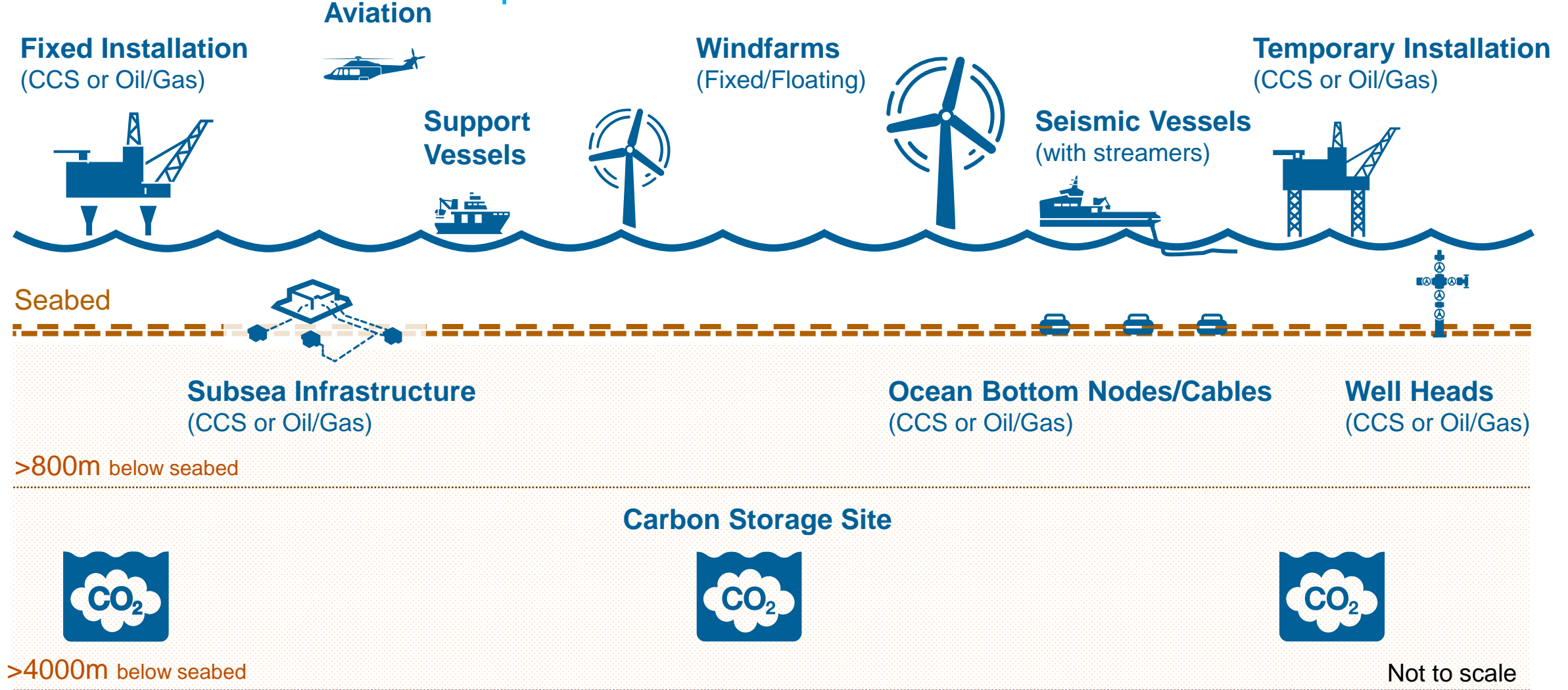
An increasingly crowded offshore space requires a greater focus on planning and prioritisation of activities.

Spatial Planning & Co-Location

Well and MMV Activities Require Active Collaboration



North Sea Transition Authority



A licensee must submit a plan for Monitoring, Measurement and Verification (MMV). Activities must be tailored to clearly-identified site risks and uncertainties.

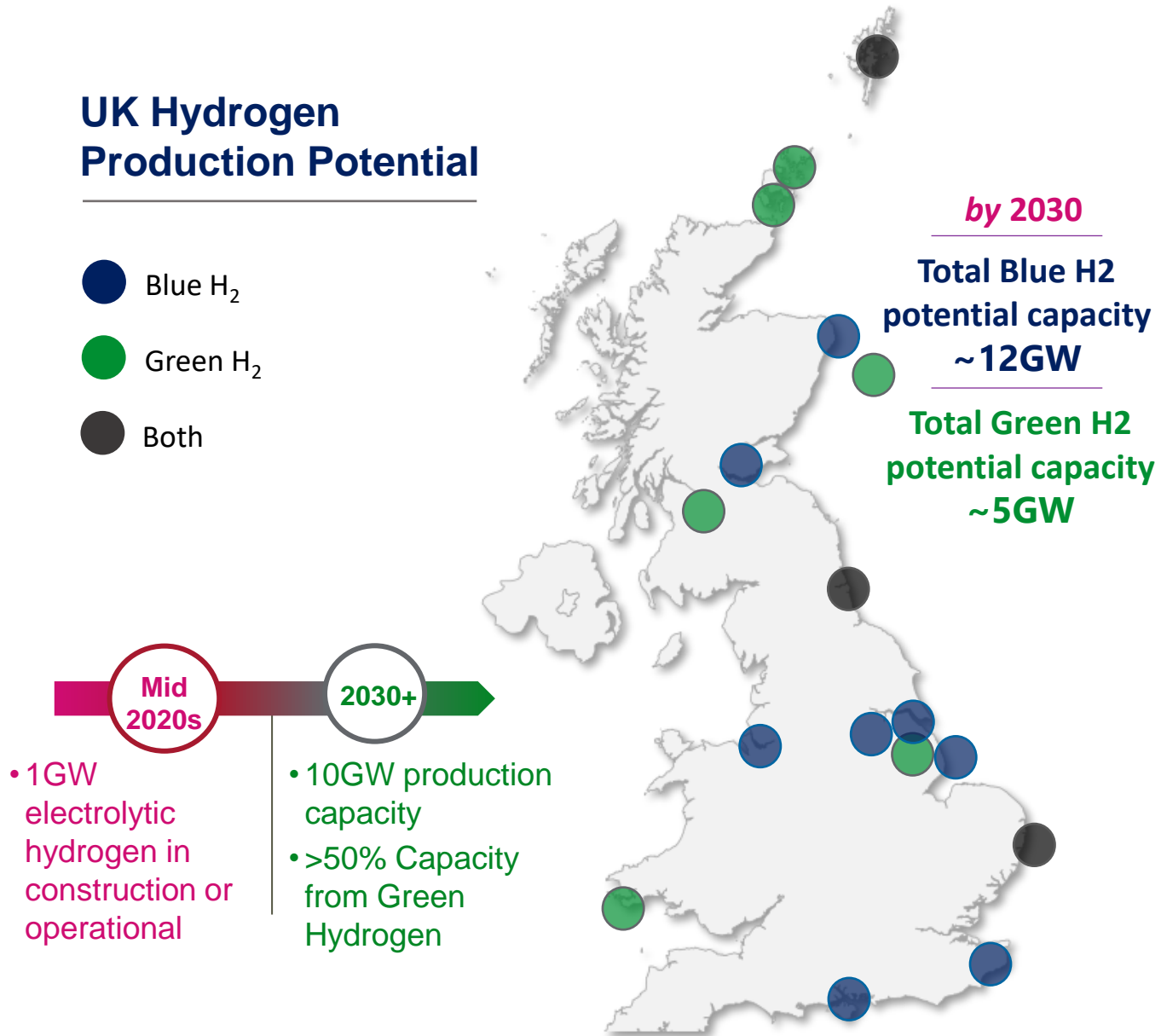
Hydrogen and energy systems approach



North Sea Transition Authority

UK Hydrogen Production Potential

- Blue H₂
- Green H₂
- Both



Enablers

Develop low-carbon production

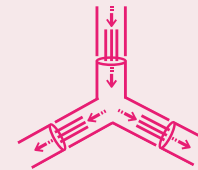


Blue H₂ : Industrial clusters & CCUS, natural gas feedstock



Green H₂ : Coastal locations, offshore renewable electricity generation capacity & water supply

Establish H₂ hubs and terminals



H₂ transmission and distribution:
Pipelines & network integration (with CO₂ / CH₄)

Establish H₂ storage networks



Storage: Offshore/ onshore; underground/ surface



North Sea Transition Authority

