North Sea Transition Authority

1st Carbon Storage Licensing Round

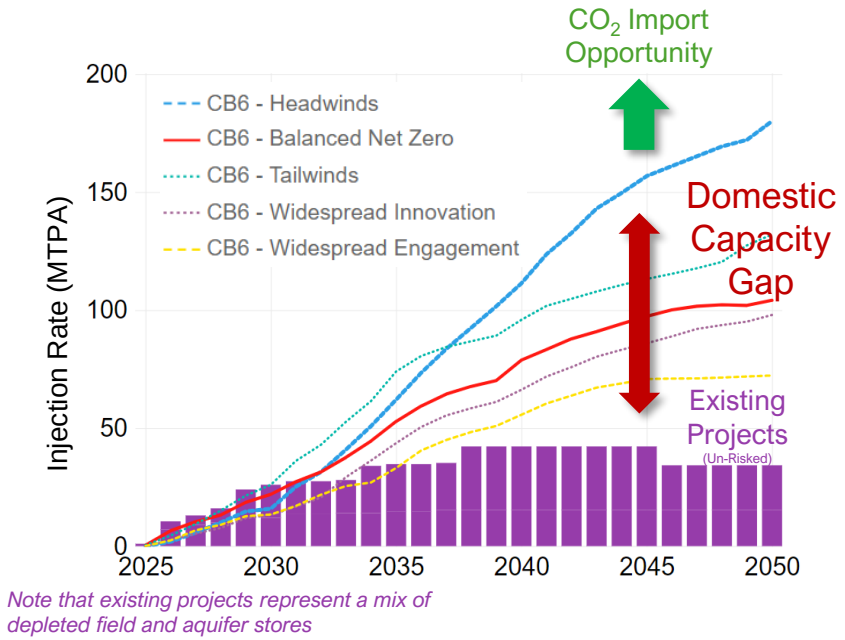
CCSA/ Net Zero Week Webinar

Jo Bagguley

Principal Regional Geologist

4th July 2023

Carbon storage potential and activity



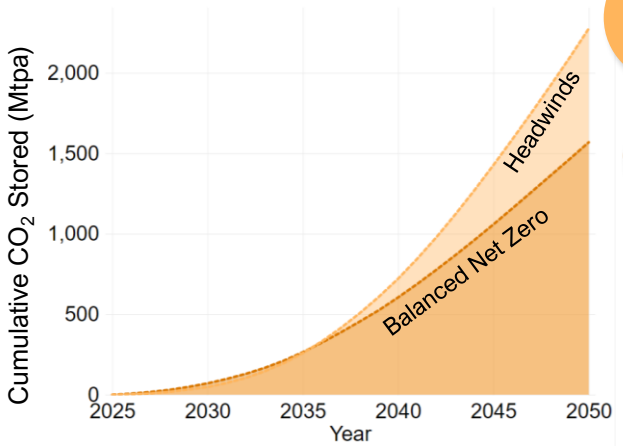
Note that existing projects represent a mix of depleted field and aquifer stores

UK targets require Pace and Scale.

By 2030, deliver 4 CCUS clusters with
20-30 $MtCO_2$/year 'Capacity'
(including 6 $MtCO_2$/year of industrial emissions capture)
50 $MtCO_2$/year by 2035

More projects required to meet targets post 2030s

CCC Carbon Budget 6 Targets



Cumulative Target Volume Stored by 2050

2.3 Gt Headwinds Scenario

1.6 Gt Balanced Net Zero Scenario

Estimated Number of Appraised Stores to meet 2050 Targets

Max 172
Min 47

Max 100
Min 28

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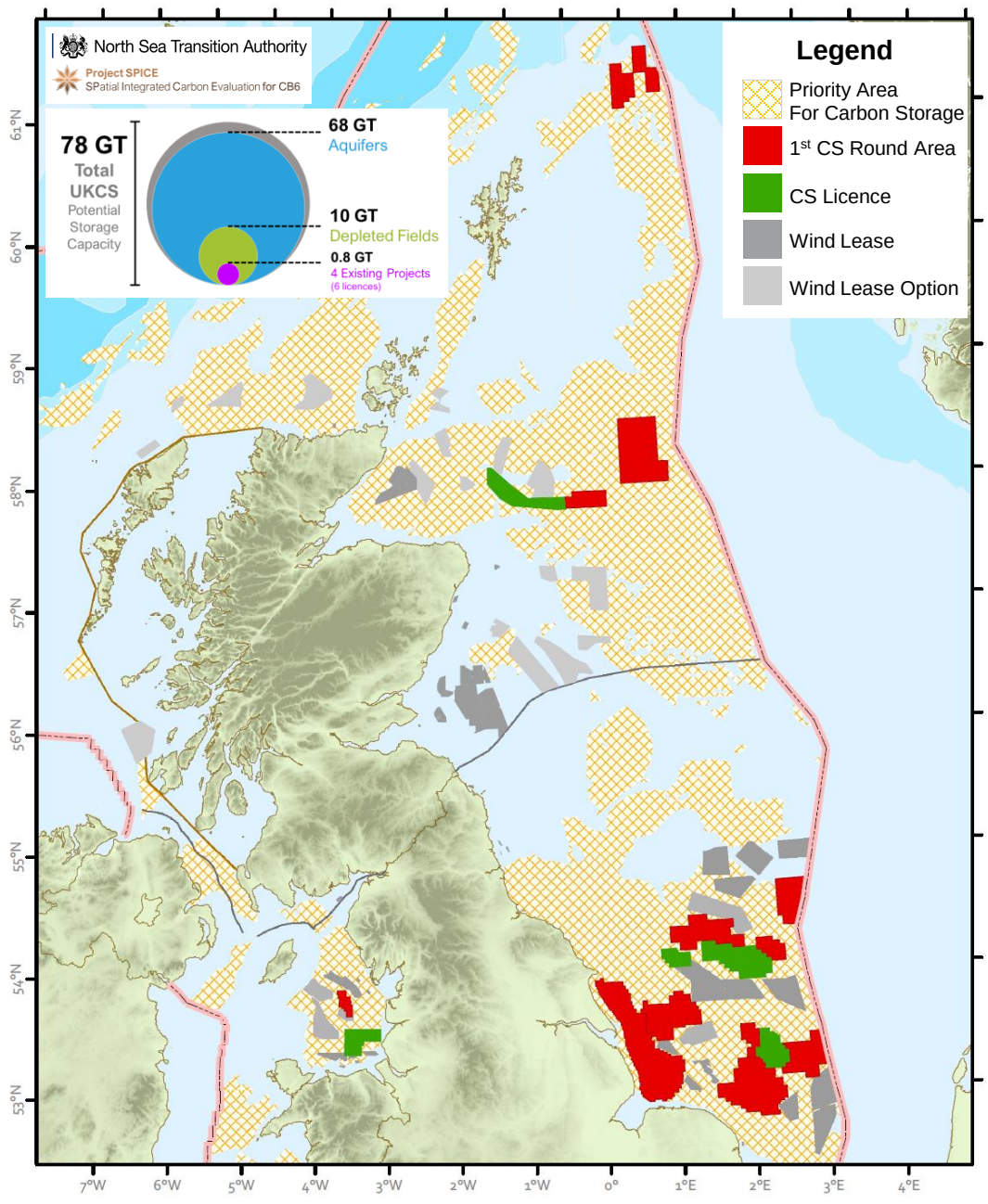
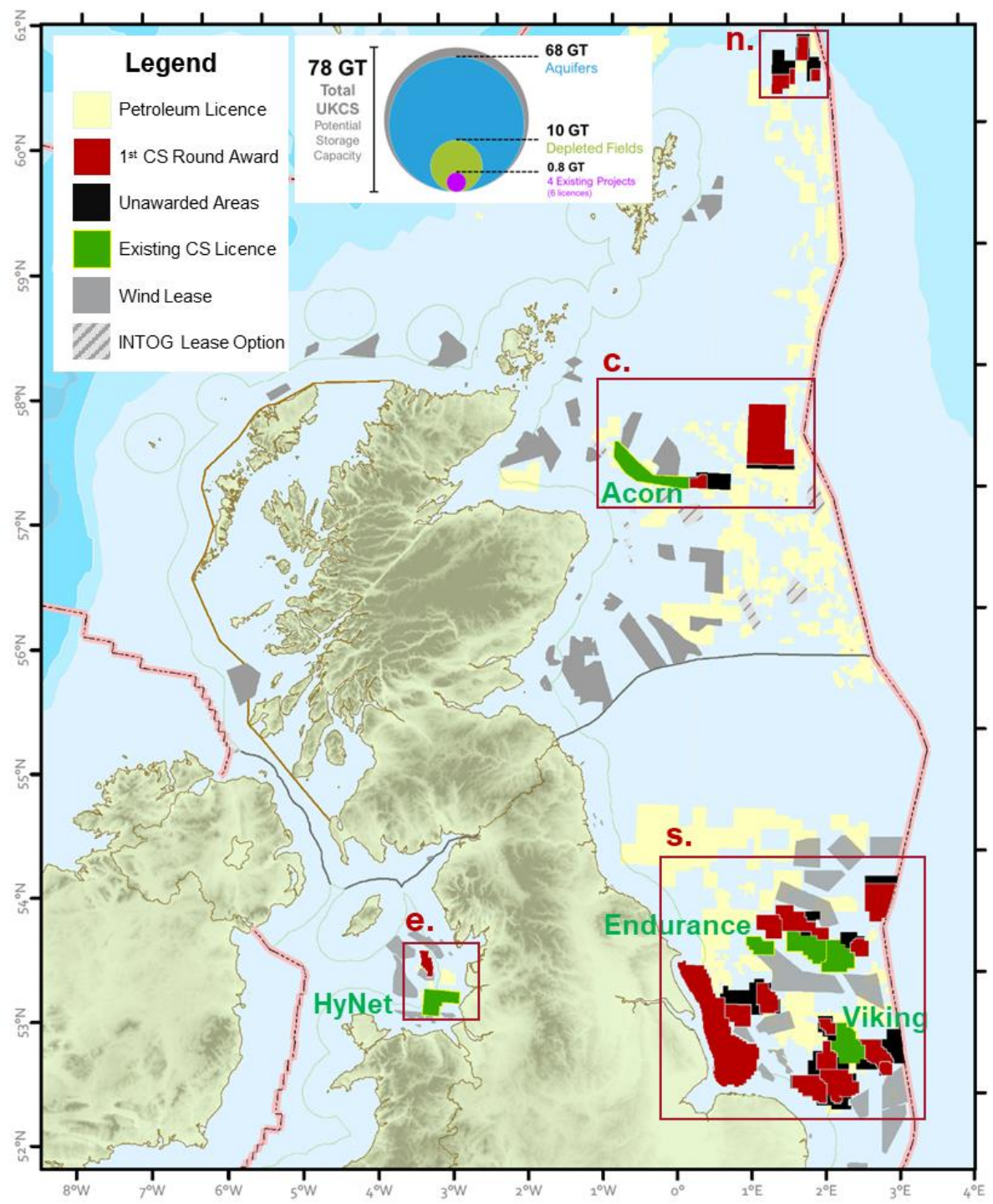




North Sea Transition Authority

UK 1st Carbon Storage Round Offers of Award

21 Licences Offered for Award
Covering **~12,000 km²**
Awards in **all areas** made available for application

Diversified Portfolio (Aquifers & Depleted Fields).
Some projects potentially injecting before 2030.

Key Success Metrics

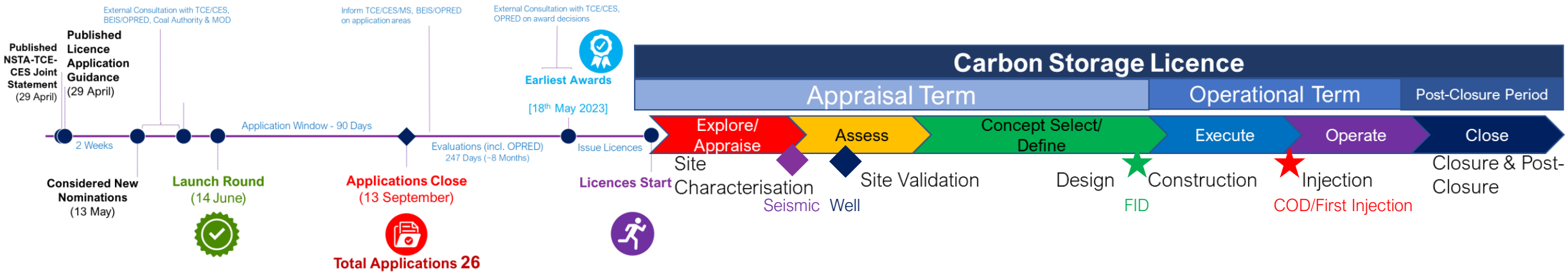
If all offers accepted,

- **5 Firm** Wells/Tests (**10 Contingent**)
- **4 Firm** Seismic Shoots (**6 Contingent**)
- Additional reprocessing and studies commitments

Expectation that licensees will work collaboratively with each other, and with marine users from other sectors.

Licence Timelines

North Sea Transition Authority



Key Work Programme Elements:

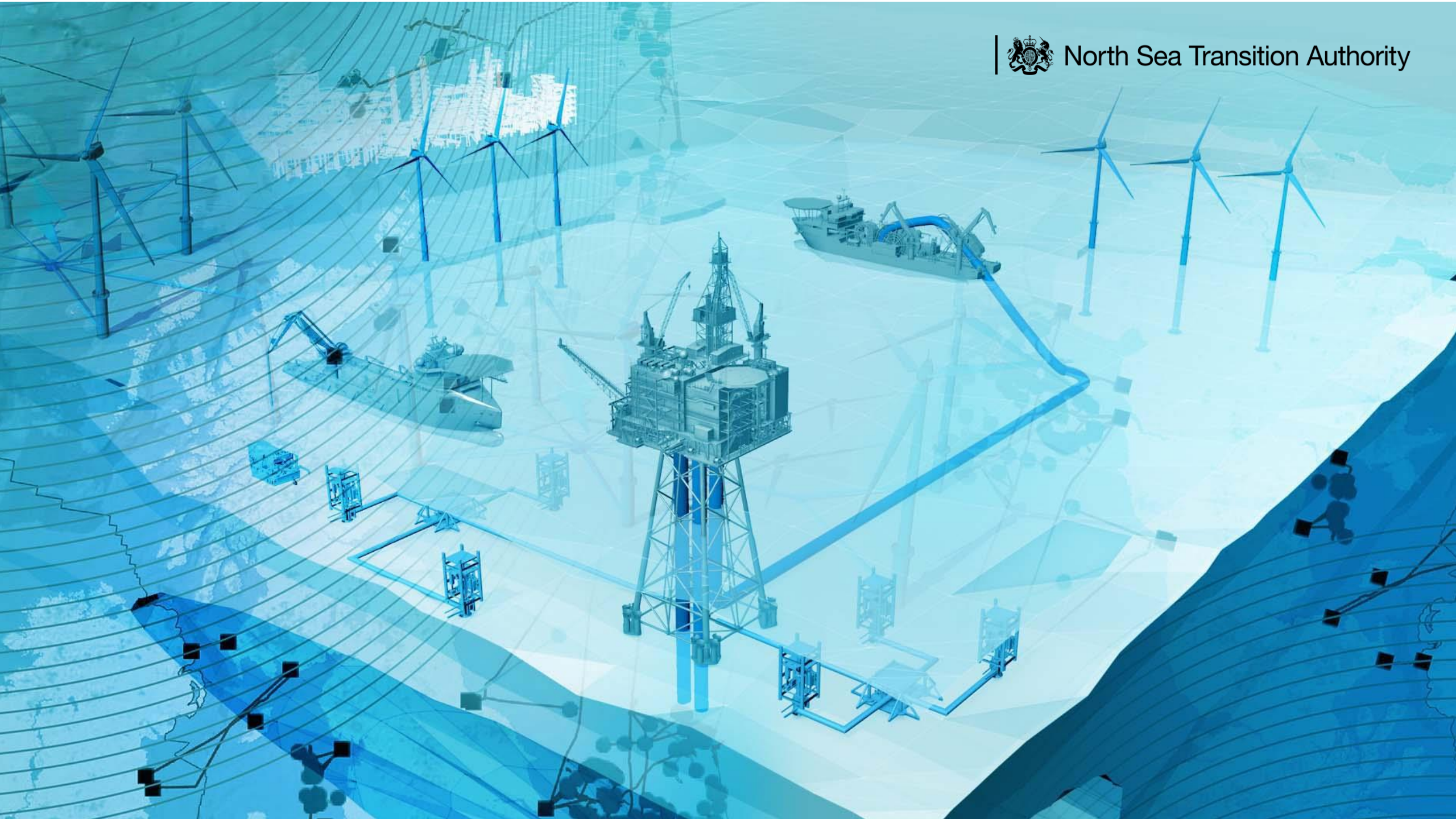
E&A Phase
- Early Risk Assessment
- Initial Site Characterisation
- Seismic
- Wells/Tests
- Preliminary Above Ground Assessment

Assess Phase
- Final Site Characterisation
- Risk Assessment
- Monitoring (MMV) and Corrective Measures Plan
- Development Plan
- Financial Security Assessment

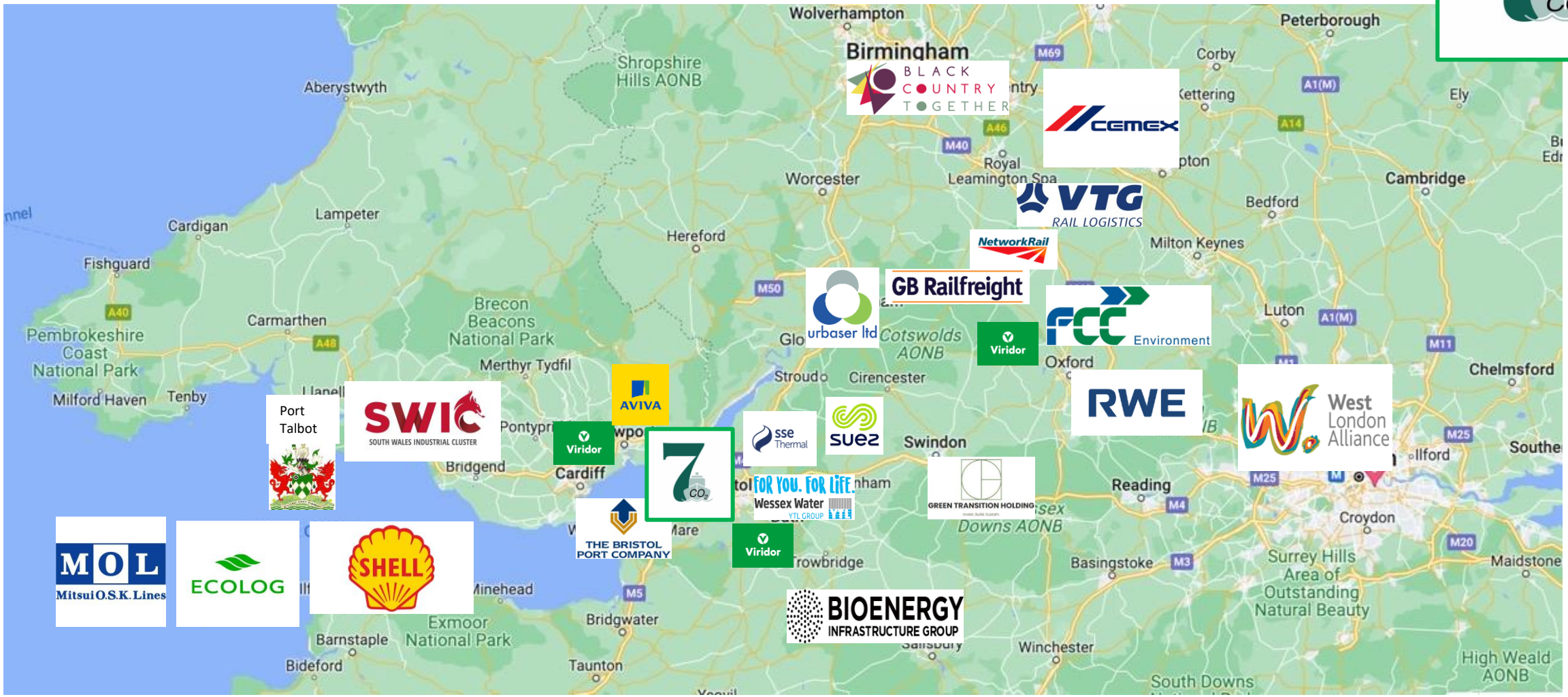
Define Phase
- Storage Permit Application Submission
- Development Plan
- MMV & CM Plan
- Provisional Closure & Post-Closure Plan
- Financial Security

Carbon Storage Permit
- Risk Assessments
- Development Wells
- Well Plugging & Abandonment
- Repeat Monitoring
- Closure & Post-Closure Plan

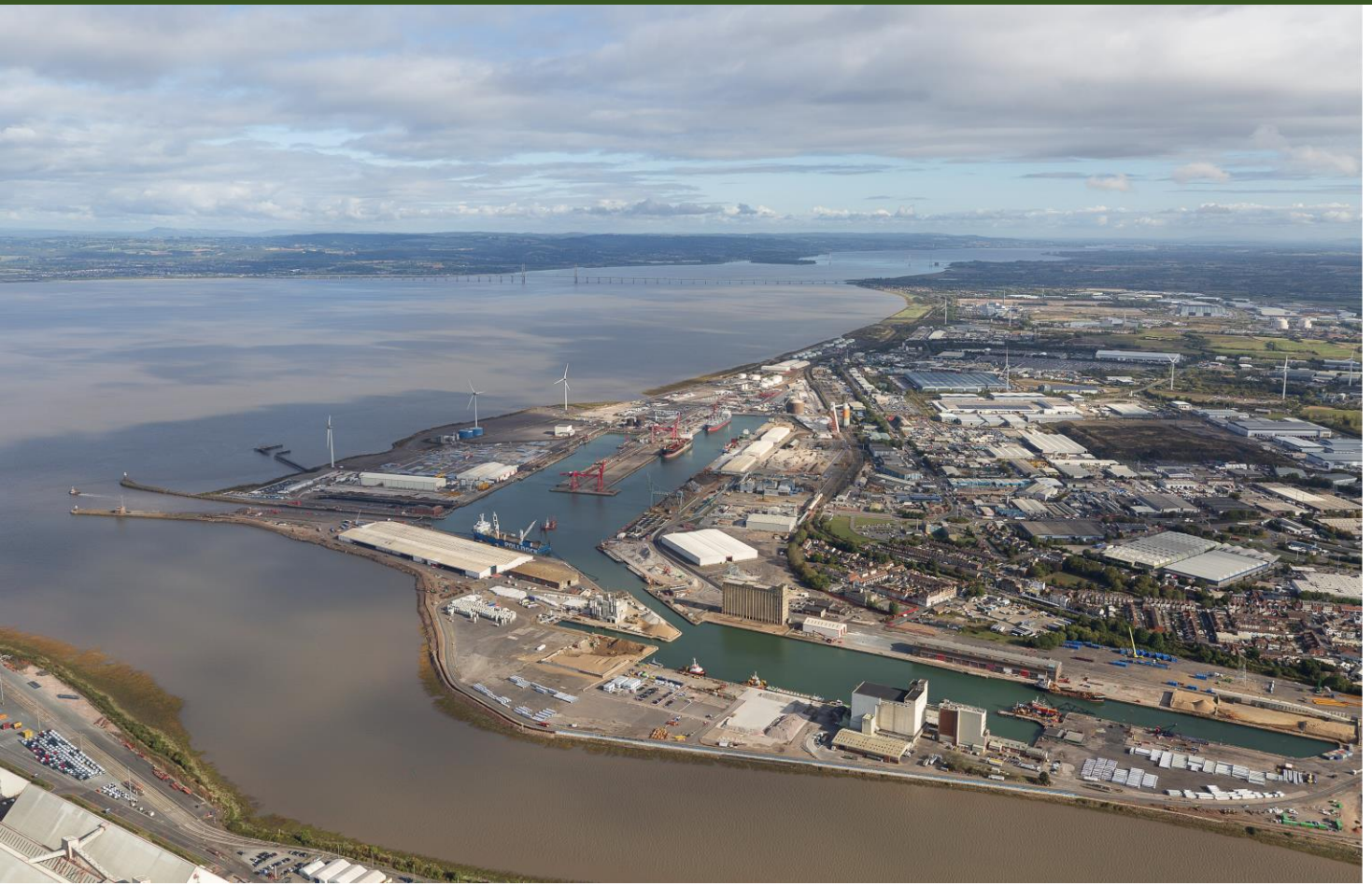
- Licences will be published on NSTA website once fully executed
- NSTA intend to evaluate round process and identify areas for improvement
- NSTA to test industry interest in further carbon storage licensing and timing


North Sea Transition Authority

7CO_2. The Severnside Carbon Capture and Shipping Hub – Bringing CCS to Dispersed Sites



$7CO_2$ – Bringing CCS to Dispersed Sites



$7CO_2$ is a carbon capture, liquefaction, storage and shipping hub based at Bristol Port:

- $7CO_2$ allows decarbonisation of major industries in the South West and South Wales
- Businesses can introduce Carbon Capture on site and pipe or rail their captured CO_2 to $7CO_2$ at the port for onward shipment and storage
- $7CO_2$ has MOUs from capturers for 4-6$MTCO_2$pa into the port
- $7CO_2$ has land agreements with Bristol Port for storage, loading, rail, an existing pipeline to over 2$MTCO_2$pa of local emissions, and for land to develop new products such as hydrogen and Sustainable Aviation Fuels, benefitting from local power, biogenic CO_2, hydrogen and $7CO_2$'s facilities
- Feasibility studies are underway for $7CO_2$ facilities and several capture projects, as well as for rail and shipping investments

$7CO_2$ – Enabling the Decarbonisation of the South West

$7CO_2$ is developing CO_2 **liquefaction and storage facilities** at Avonmouth docks

Currently working on **common design for rail** transportation for dispersed sites – to the benefit of all dispersed emitters

Collecting CO_2 at scale **underpins independent investment in CO_2 ships** for long term geological storage – becoming available for more hubs and imports

By linking to shipping, $7CO_2$ will not be dependent on any individual pipeline or CO_2 store

Introducing CCS at only a couple of emitter sites will underpin investment in the $7CO_2$ hub and onward shipping; **early Government support for some projects will be critical**

Once established, **all regional emitters can introduce CCS with confidence**, as both $7CO_2$ and shipping can be augmented on a modular basis

$7CO_2$ – Key Challenges for Dispersed Sites

Challenges:	Actions:
Demonstrating cost competitiveness of rail and shipping	• Feasibility underway for 7CO2 hub, rail and shipping • Demonstrate the resilience of shipping and rail versus static pipeline • Track 2 bids will demonstrate competitiveness
Ensure rail, hub and ships fit into CCS Business Models	• CCSA Non Pipeline Transport Group has submitted CO2 ship charter and matrix of how shipping and hubs fit into CCS capture and T&Sco models • Cross chain and regulatory protections are preserved
Market needs to believe shipping and dispersed site bids are welcomed in 'Track 2'	• Draft 'bidding instructions' being prepared by CCSA • Policy support needed for dispersed sites to meet wider decarbonization and regional development goals
Establishing initial hubs, rail and ships, to remove barriers to modular growth	• Government should select some dispersed sites sufficient to justify building hubs and ships, with capacity, to incentivize further dispersed sites and imports

PEAK CLUSTER

Industrial decarbonisation at scale

PEAK CLUSTER Who are we?

A Cluster of companies collaborating to deliver at scale industrial decarbonisation at six sites by 2030.

Peak Cluster will capture and transport carbon dioxide emissions to be stored permanently, under the sea bed.

PEAK CLUSTER

PROGRESSIVE ENERGY

BREEDON

Lhoist

AGGREGATE INDUSTRIES

TARMAC A CRH COMPANY

LOSTOCK SUSTAINABLE ENERGY PLANT

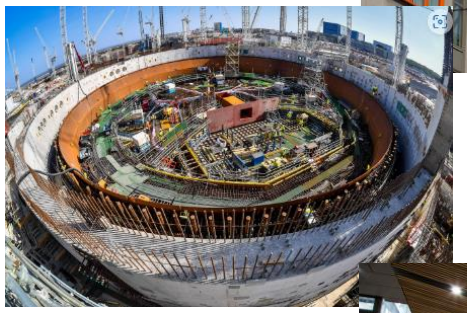
PEAK CLUSTER An economic and low carbon imperative

The ‘Peak Cluster’ cement and lime facilities together:

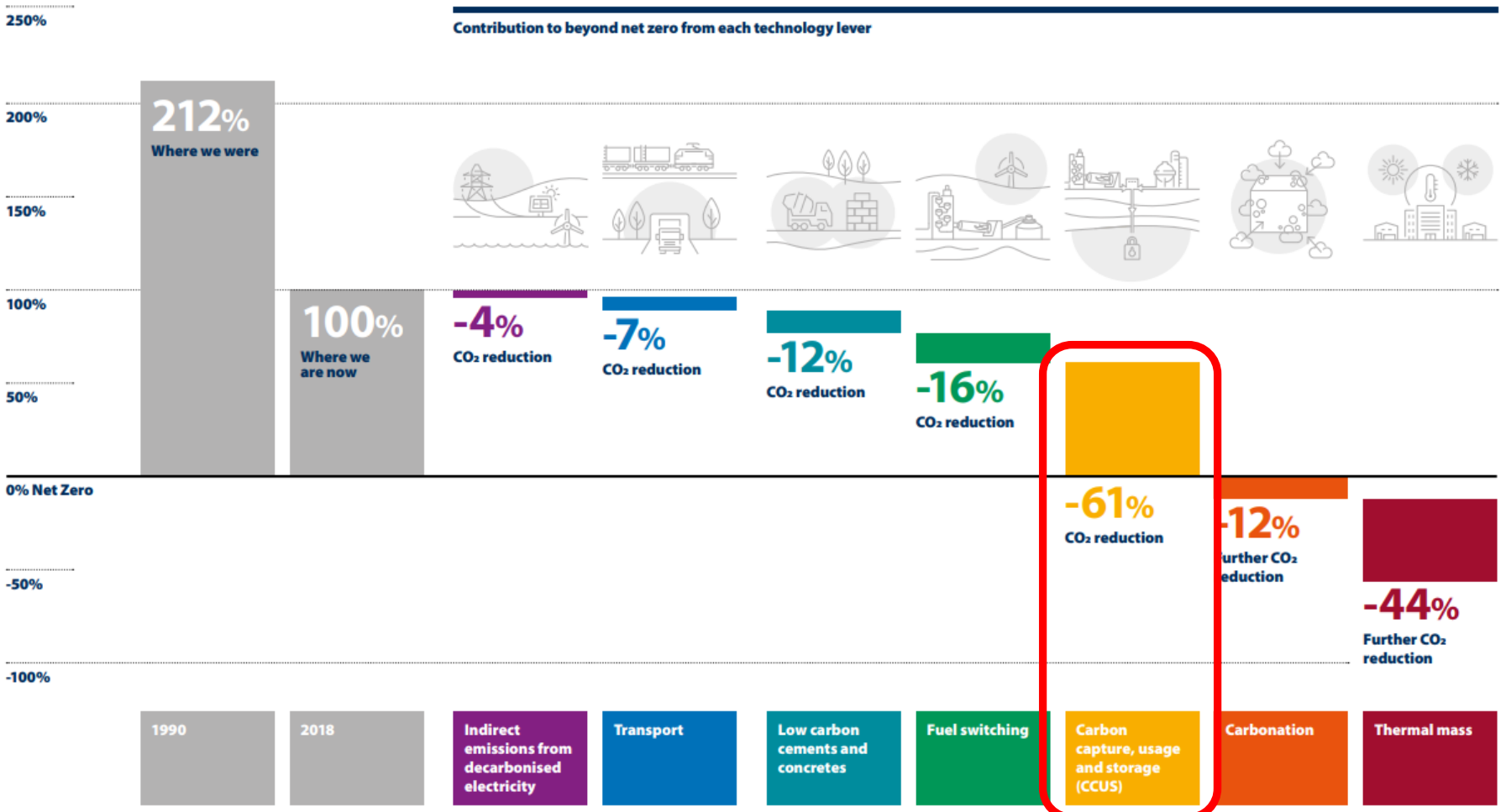
- Produce **40%** of the UK’s lime and cement
- Support around **1,000 direct jobs** and deliver significant GVA
- Emit **3 million tonnes of CO_2** per year
- Account for over **23% of emissions** in Derbyshire and Staffordshire

Lostock Sustainable Energy Plant will emit 0.6 million tonnes of CO_2 per year.


Mortars
Baking powder
Pharmaceuticals
Fruit farming
Plasters
Plastics
Increase shelf life
Environment
Heritage
Dairy industry
Sewage treatment
Incinerators
Fish farming
Corn tortillas
Sand-lime bricks
Concrete blocks
Lime concrete
Asphalt
Renders
Land stabilisation
Power stations
Oil additives
Antacids
Gelatin
Glue
Iron and steel
Manufacturing
Additives
Food
LIME
Agricultural liming
Conservation
Effluent treatment
Contaminated land
Non-ferrous metals
Glass
Treat drinking water
Sugar manufacture
Paper
Emission abatement
Animal hygiene
Construction
Rubber
Water

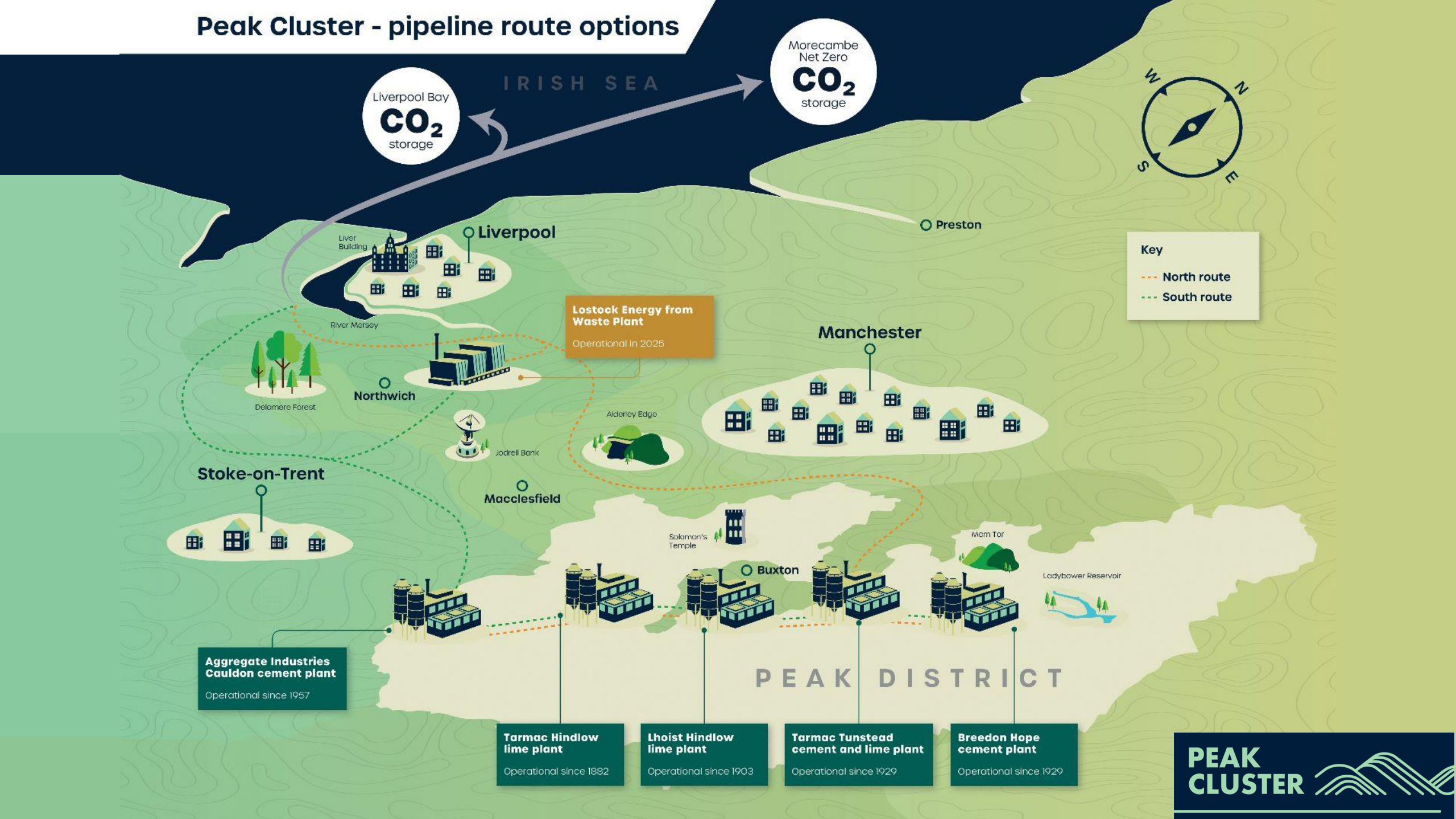


Reaching net zero



CCUS

Peak Cluster - pipeline route options



PEAK CLUSTER

Peak Cluster: timeline

2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030

Track 2 competition

Public launch / early engagement

Consents and approvals obtained

Operational

PEAK CLUSTER


Industrial decarbonisation at scale
peakcluster.co.uk
info@peakcluster.co.uk
@peak_cluster
Peak Cluster

Bacton Thames Net Zero

Serving the South East and Beyond

24 May 2023

Eni at a glance

Eni is a major international energy company with a global reach.
Eni intends to be a leader in the energy transition.

the new Eni towards 2050

UPSTREAM
GAS SHARE: ~**85%**

GAS & LNG MARKETING AND POWER
AN INTEGRATED
MARKET ENERGY PLAYER

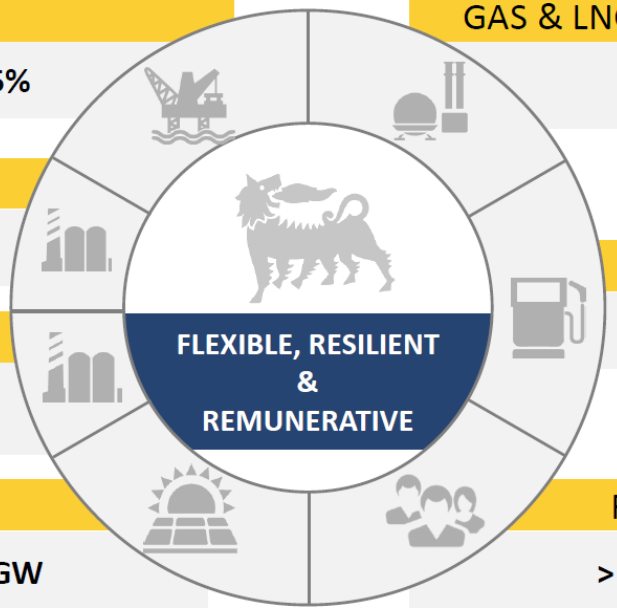
REFINING
5 MTPA BIOFUELS

MARKETING
100% SUSTAINABLE FUELS

CHEMICALS
SPECIALTIES,
BIO & RECYCLED PRODUCTS

RENEWABLES
INSTALLED CAPACITY > **55 GW**

RETAIL GAS & POWER
> **20 MLN** CUSTOMERS



c. 61,000
Employees worldwide

Present in UK since 1964
>900 UK employees

Supporting the UK's energy transition with CCS

- CO_2 Transportation and Storage interests in Liverpool Bay and Hewett fields.
- October 2020 - Eni awarded CO_2 appraisal and storage licence for Liverpool Bay fields by NSTA
- October 2021 – Eni's confirmed as UK CCUS Cluster Track 1 project, on behalf of HyNet Cluster
- September 2022 – Hewett CO_2 Appraisal/ Storage Licence application submitted (part of Bacton Thames Net Zero)
- June 2023 – Licence application successful for Hewett and surrounding area

BTNZ – a regional CCS cluster with a European dimension

The South East of UK :

- 23 % of UK total CO2 emissions
- Smallest historic reduction in last 15 years
- High Priority area for decarbonisation
- Scope for international CO2 trade/storage

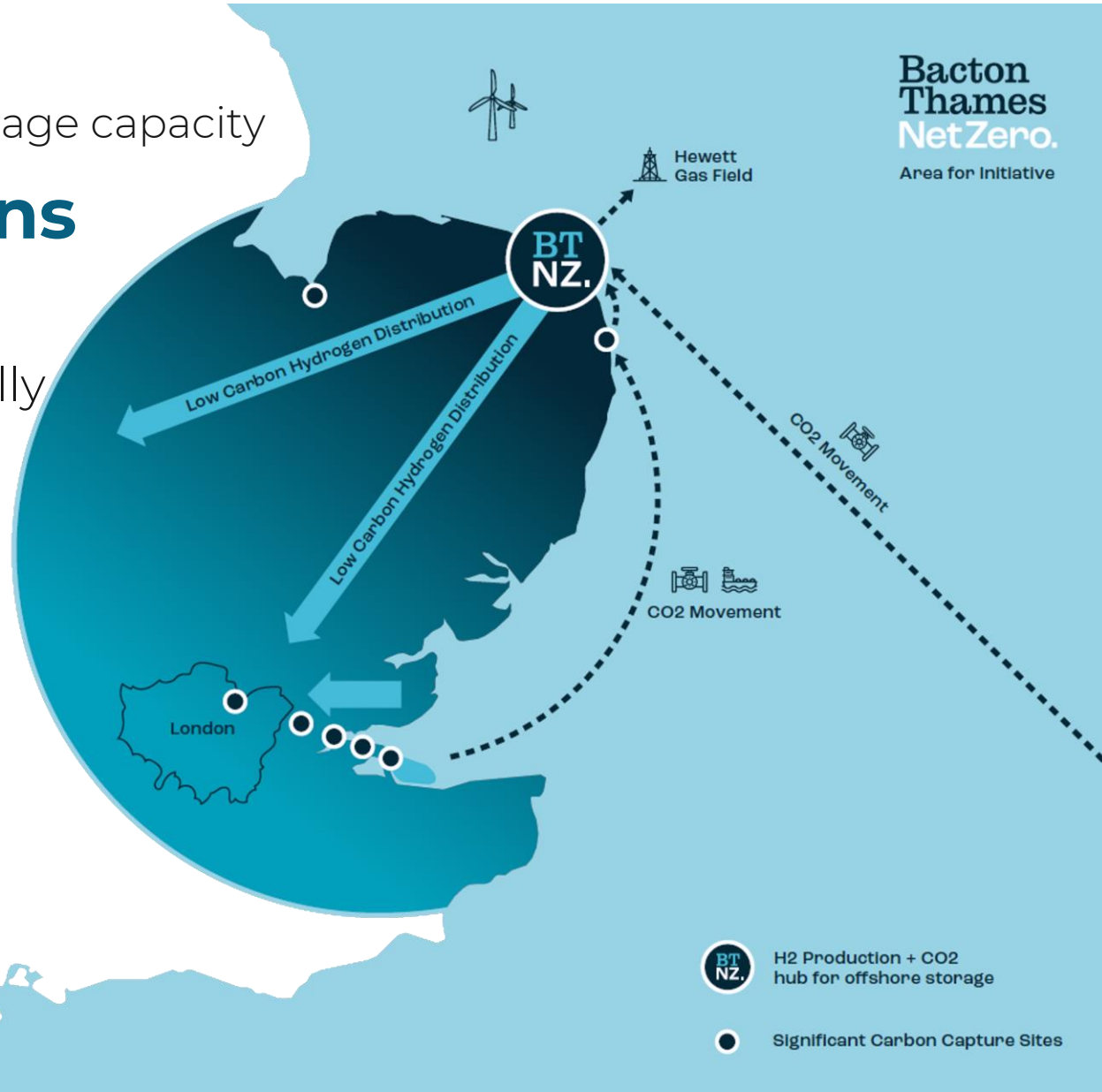
Demand driven consortia led by Eni:

Hewett Total storage capacity

300 Mtons

18 Mtons

CO_2 captured annually



THE SOLENT CLUSTER

WORKING TOGETHER FOR A LOWER CARBON FUTURE

THE SOLENT CLUSTER

OUR VISION

We want the Solent and wider region to become a leading area for low carbon investment, now and for the future

We will aim to bring new jobs and investment for the benefit of our communities

We will help secure existing jobs and livelihoods

We want to help the UK remain competitive and deliver on national energy priorities

We aim to make a major contribution in the UK's move to Net Zero

We will provide a platform to showcase the Solent's low carbon innovation and collaboration


THE SOLENT CLUSTER
POTENTIAL THROUGH PARTNERSHIP
HEATHROW, GATWICK AND BIRMINGHAM
WASTE TO SUSTAINABLE AVIATION FUEL (SAF)
WORLD SCALE BLUE HYDROGEN
INNOVATION PROGRAMMES
RESEARCH PROGRAMMES
LOWER EMISSION FUELS
HYDROGEN FUEL FOR HOMES
GREEN HYDROGEN
SOLAR
TIDAL
FAWLEY
DECARBONISE INDUSTRY
TECHNOLOGY PROGRAMMES
ALTERNATIVE ENERGY SOURCES FOR TRANSPORTATION
FAWLEY
CCS DELIVERED TO FAWLEY FOR STORAGE
PIPELINE TO CARBON CAPTURE AND STORAGE
WASTE TO METHANOL SHIP FUEL
THE SOLENT CLUSTER

Unleashing The UK's CCUS Potential – The MNZ Opportunity

Jack Richards – Asset Manager

SPIRIT ENERGY

Spirit Energy

Spirit Energy is a predominantly gas (96%) production business, with assets in UK and Netherlands

3rd largest gas producer on the UK continental shelf

At the centre of Spirit Energy's long-term strategy is pursuing energy transition opportunities from our existing assets

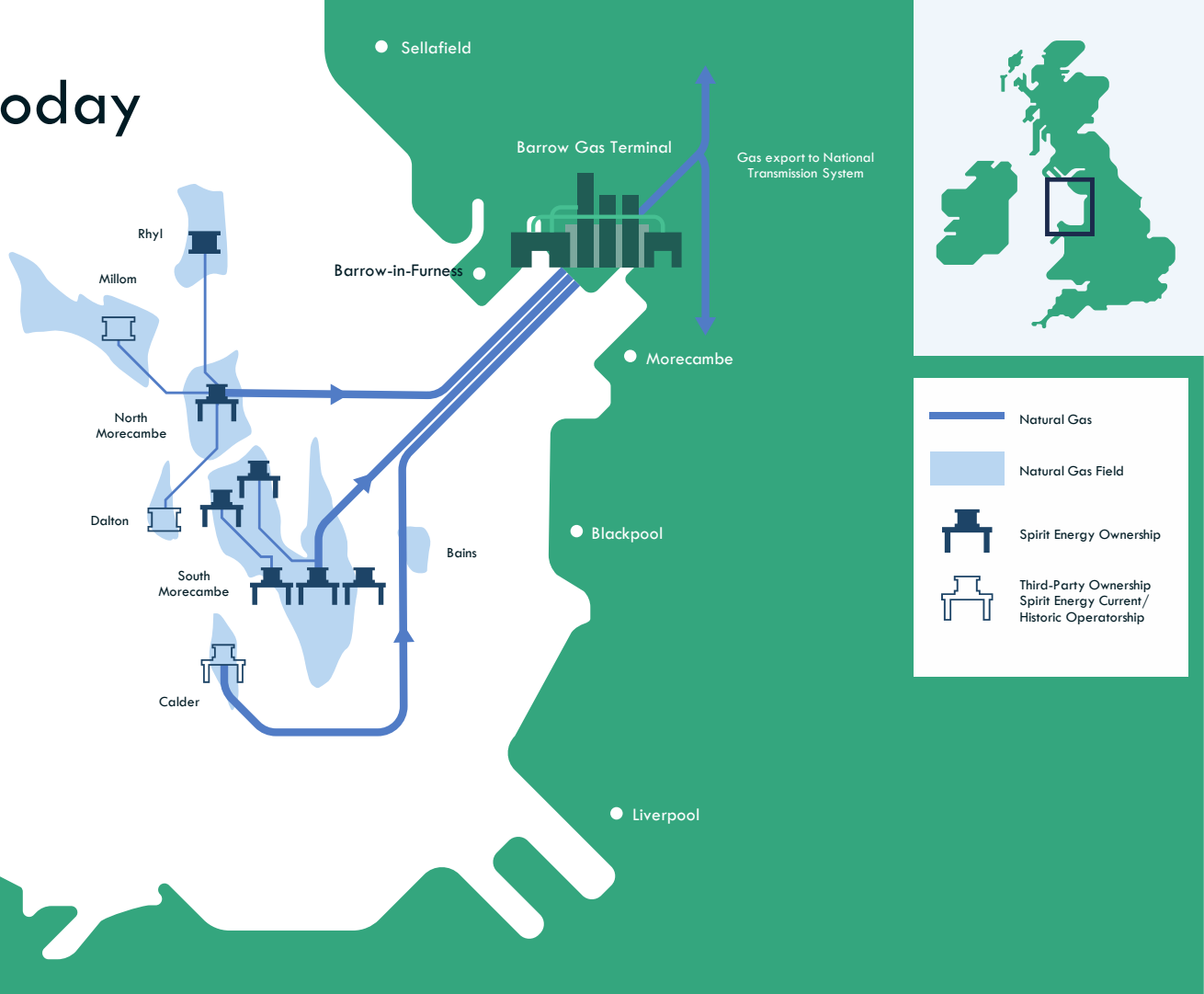
Spirit Energy's shareholders are Centrica (69%) and Stadtwerke München GmbH (31%)

Both are supportive of our ambitions to repurpose our assets for a positive Net Zero impact

SPIRIT ENERGY

Morecambe Hub today

- Cluster of large gas fields under the East Irish Sea, approx 25km west of Barrow-in-Furness
- Gas is transported by pipeline to Barrow Terminal for processing and export to the UK gas grid
- Supplies around 1.5% of UK gas consumption
- Employs around 400 highly skilled people
- Approaching end of field life



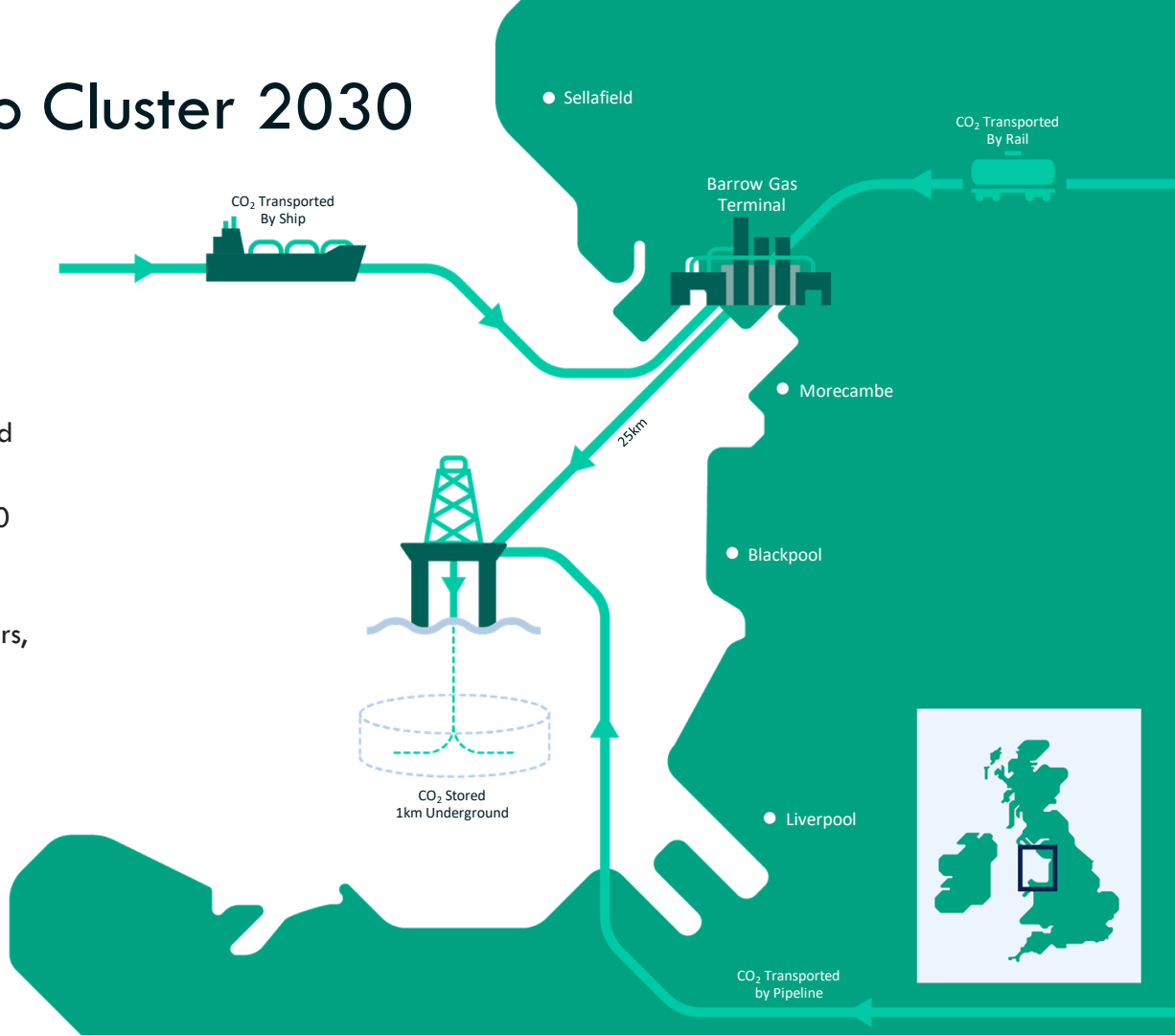
Morecambe Net Zero Cluster 2030

MNZ

- One gigaton of CO_2 - one of the UK's largest carbon stores
- Targeting 10 MTPA by 2030 – one third of the Government's target to capture and store 20-30 MTPA of CO_2 by 2030

Transport by pipeline, ship and rail

- CO_2 pipeline from multiple large emitters, including the Peak Cluster
- Shipping and rail transport will support stranded emitters



SPIRIT ENERGY

MNZ in the journey to Net Zero

Pathway to Net Zero

CCUS is a necessity, not an option, for the transition to net zero

Provides feasible, long-term solution for hard-to-abate industries

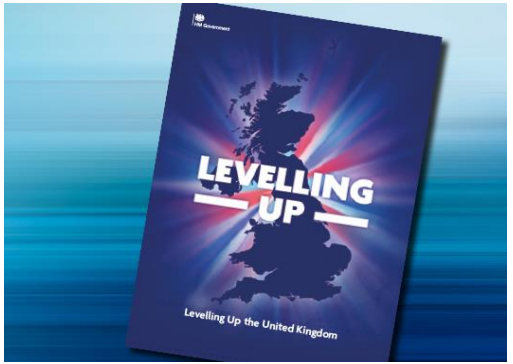
Opens doors to international export opportunities for CO_2 and hydrogen

Energy security

Utilise remaining natural gas reserves whilst managing CO_2 emissions

Catalyst for other energy developments including hydrogen

Ambitions for region to become green energy 'superplace'



Levelling up & jobs

Repurposing infrastructure will secure hundreds of jobs and enable upskilling

Multi-billion-pound investment into the North West, a levelling up target

Retains domestic industrial output while meeting Net Zero targets

SPIRIT ENERGY