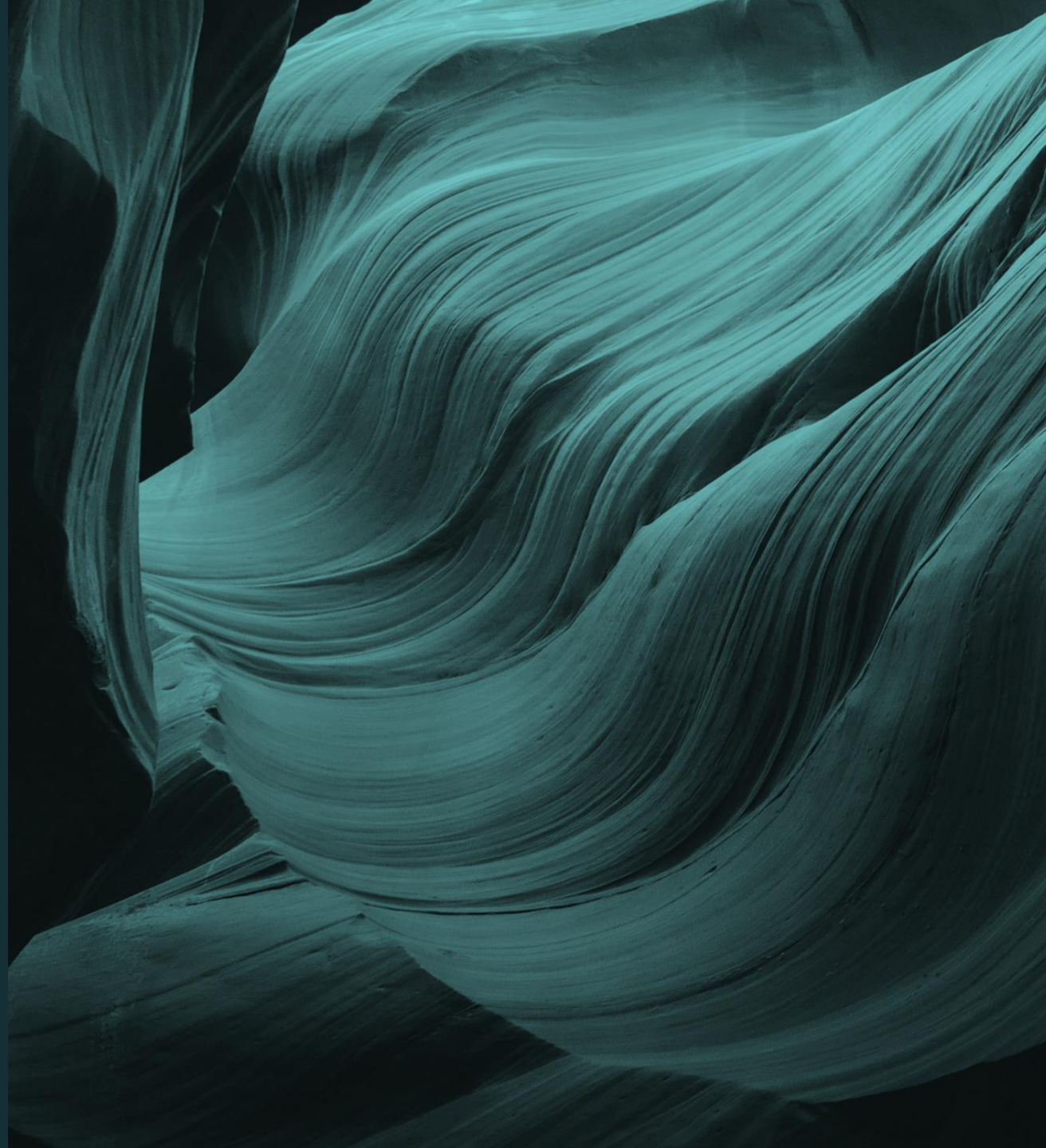


# CCUS Deployment in the UK

EMN Energy Gases,  
Lisbon/Online

21 March 2023

Olivia Powis, Head of UK Office  
Carbon Capture and Storage Association



# Contents:

1. About the CCSA
2. UK Developments & Cluster Programme
3. Key developments in other markets
4. Conclusions

**The CCSA is the trade association  
accelerating the commercial deployment of  
Carbon Capture, Utilisation and Storage  
(CCUS) through advocacy and collaboration**

# CCSA Members (107)



## CO<sub>2</sub> Storage

## Power & Industrial

## Carbon Capture Developers



## Engineering & Equipment

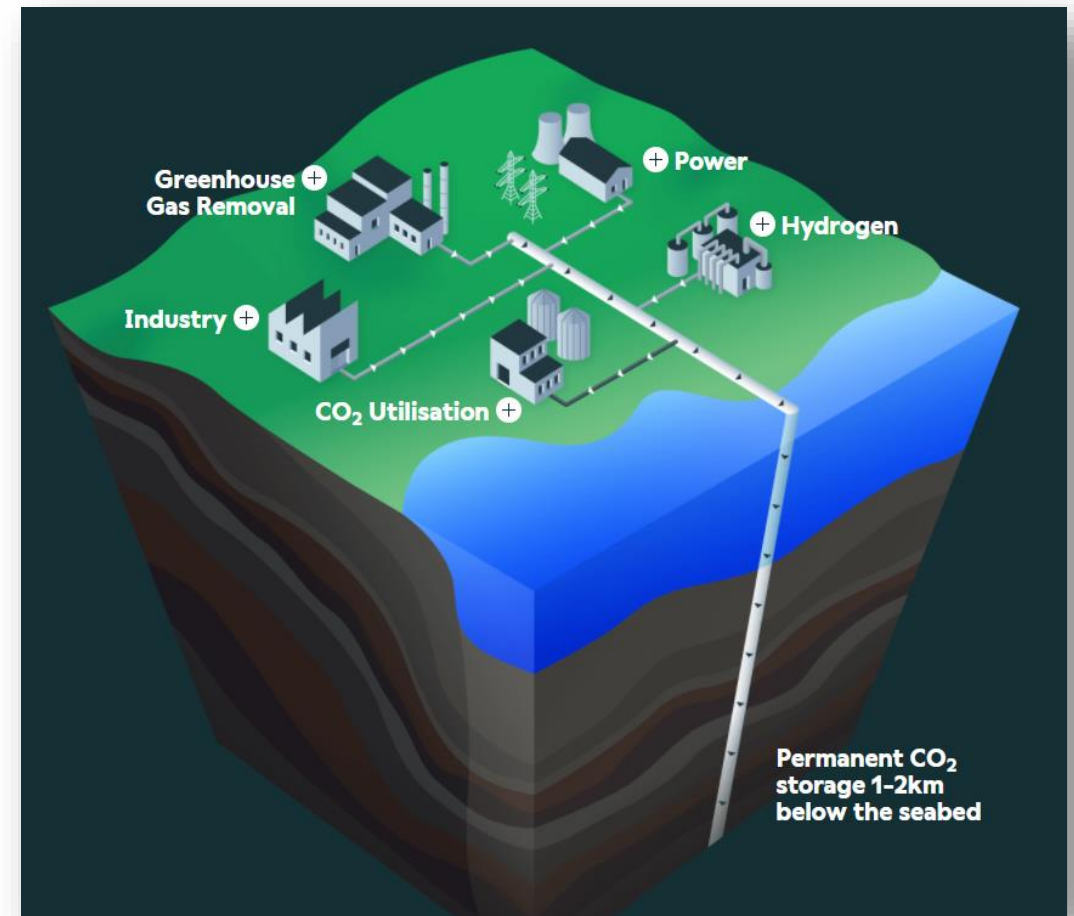
## CO<sub>2</sub> Transport & Distribution

## Financial, Consulting & Others



# The CCUS Value Chain

- **Capture CO<sub>2</sub>** from:
  - Power generation
  - Industrial activity (cement, refinery, steel etc)
  - Hydrogen production
  - Bioenergy sources (BECCS) and the air (DACCS)
- **Transport CO<sub>2</sub>** via pipeline or ship
- **Store CO<sub>2</sub>** in deep geological formations, e.g. depleted oil & gas fields or deep saline formations.
- **Use CO<sub>2</sub>** in products, some of which can keep CO<sub>2</sub> from the atmosphere for long periods of time, and others that simply recycle the CO<sub>2</sub>, with less climate benefit.



**Different applications of CCUS technology can be deployed at sites located close together to take advantage of the economies of scale in the CO<sub>2</sub> transport and storage network – referred to as *clusters***

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1. About the CCSA

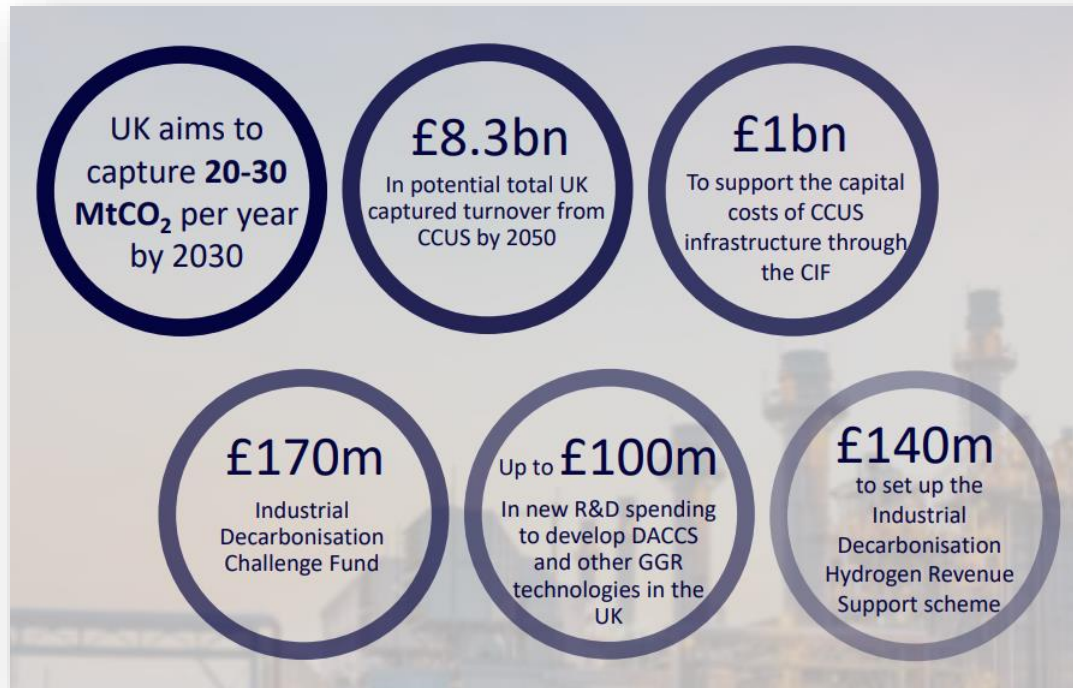
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# UK Government CCUS Strategy launched in October 2021

- Ambition to capture 20-30 MtCO<sub>2</sub> a year by 2030, rising to over 50Mtpa by 2035
- Committed to **four CCUS clusters** with at least two operating by the mid-2020s and at least another two by 2030

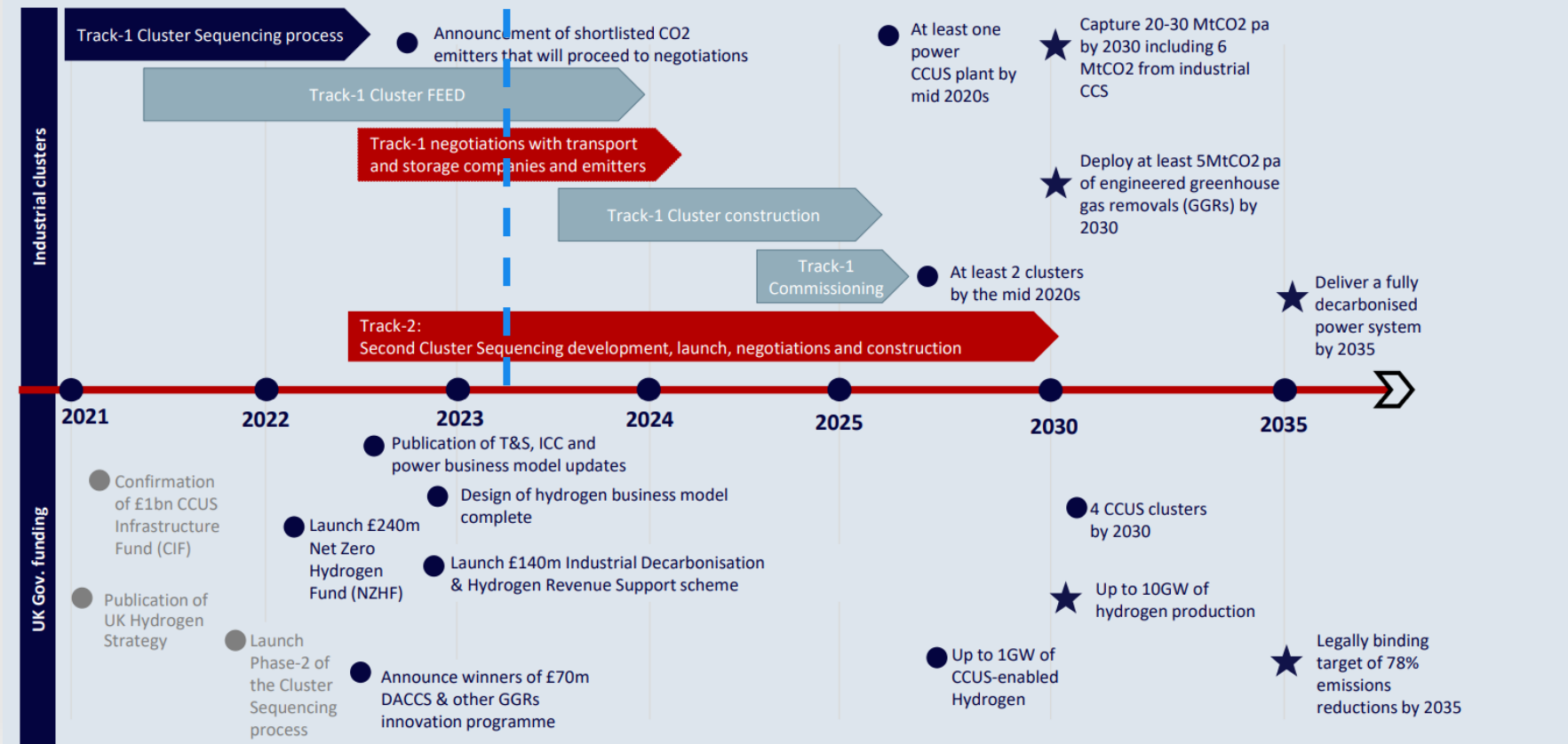


## UK Government “CCUS Investor Roadmap”

# State of Play – UK Govt CCUS Programme

## Our 2035 Delivery Plan

Critical activities and milestones on a path to developing the UK CCUS sector



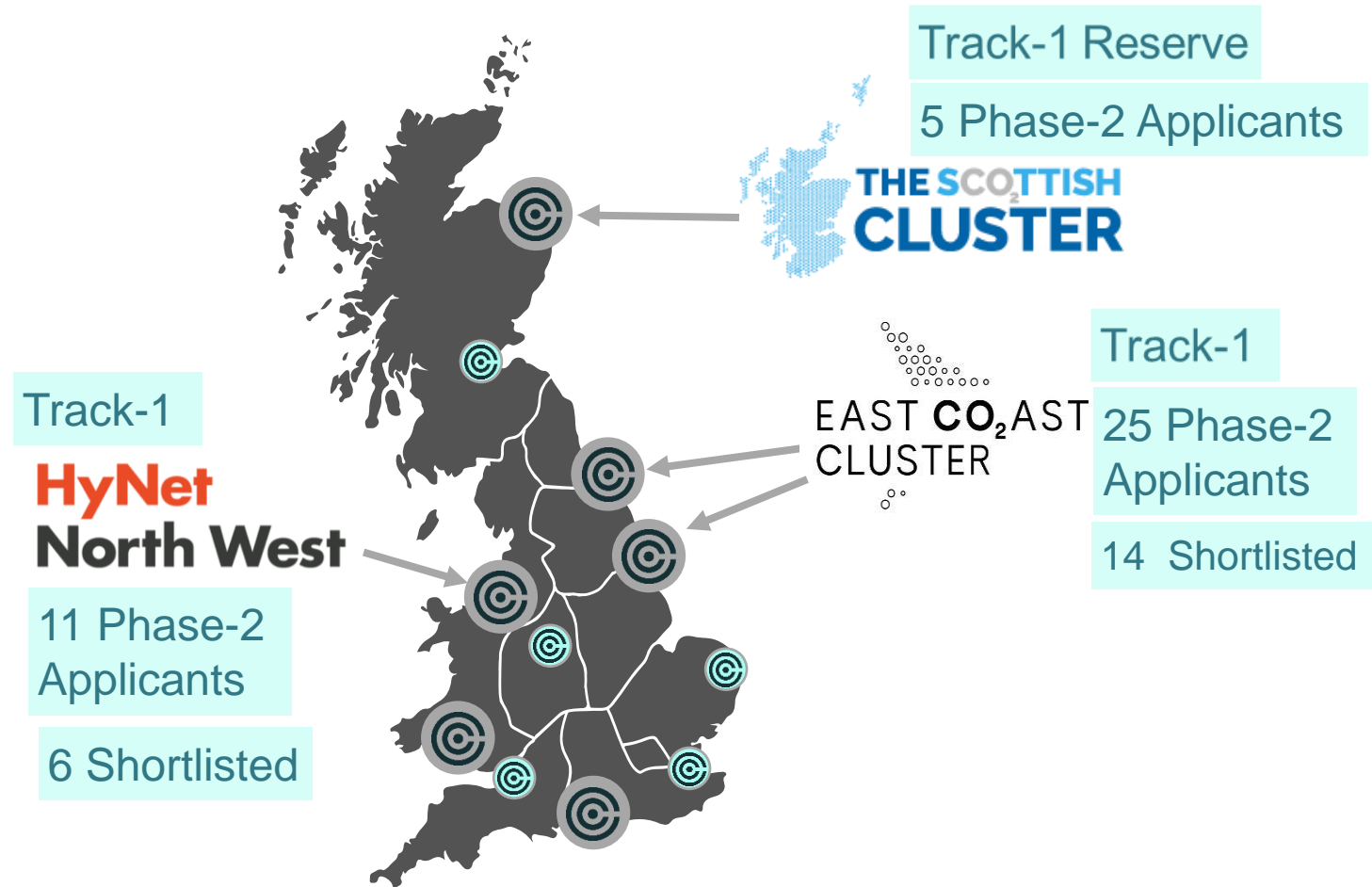
# Status of UK Cluster Sequencing Programme

## Track-1 Clusters

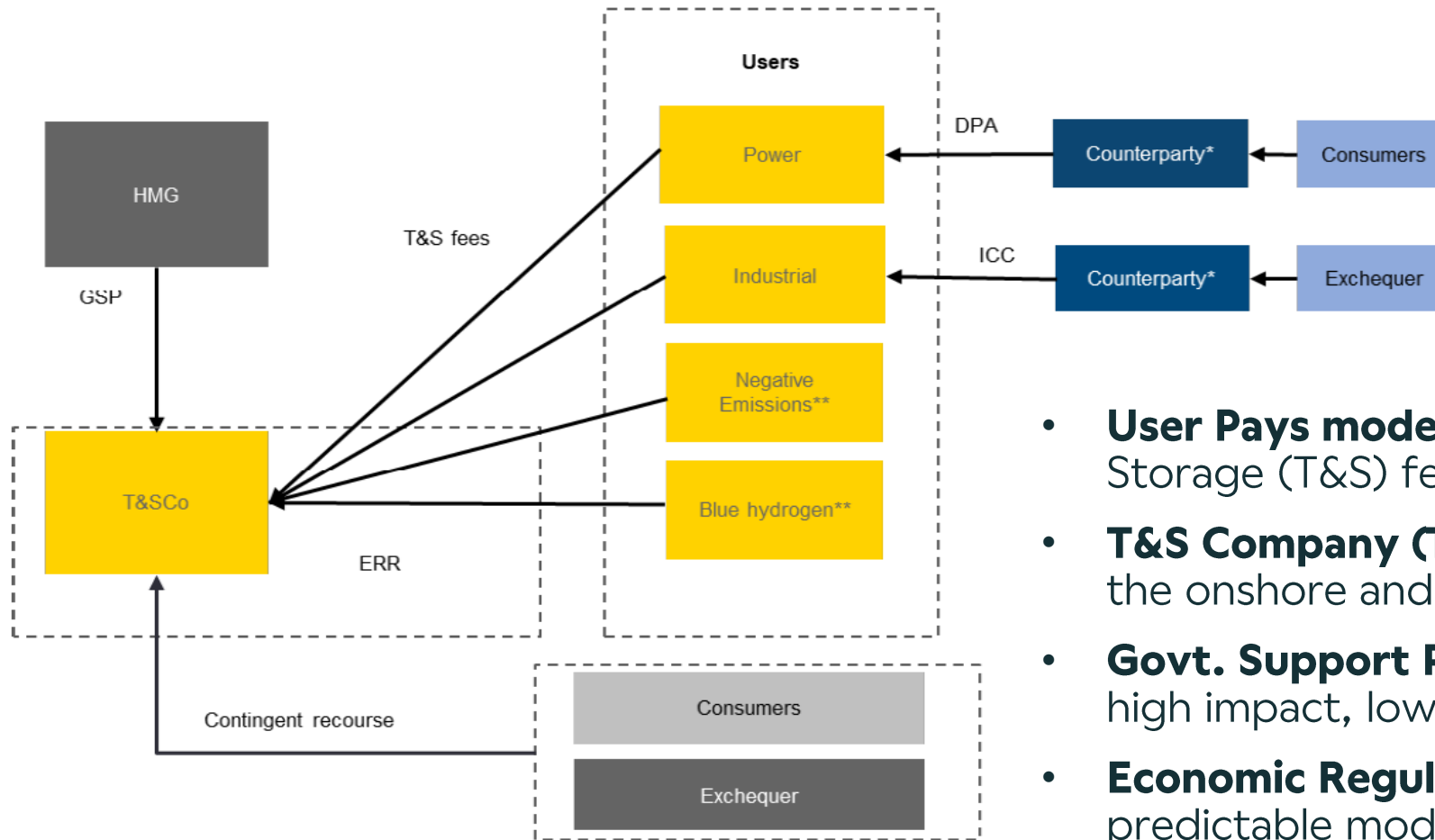
- Govt selected 2 clusters in November 2021 to be operational in “mid-2020s” plus one “reserve” cluster

## Phase-2 competition:

- 41 eligible projects applied for Government support to access ‘Track-1 Cluster’ CO<sub>2</sub> Infrastructure.
- 20 projects shortlisted in August 2022 (Power, Hydrogen and Industrial)
- Currently waiting for final list of projects to proceed to contract
- Aim to be operational by end of 2027

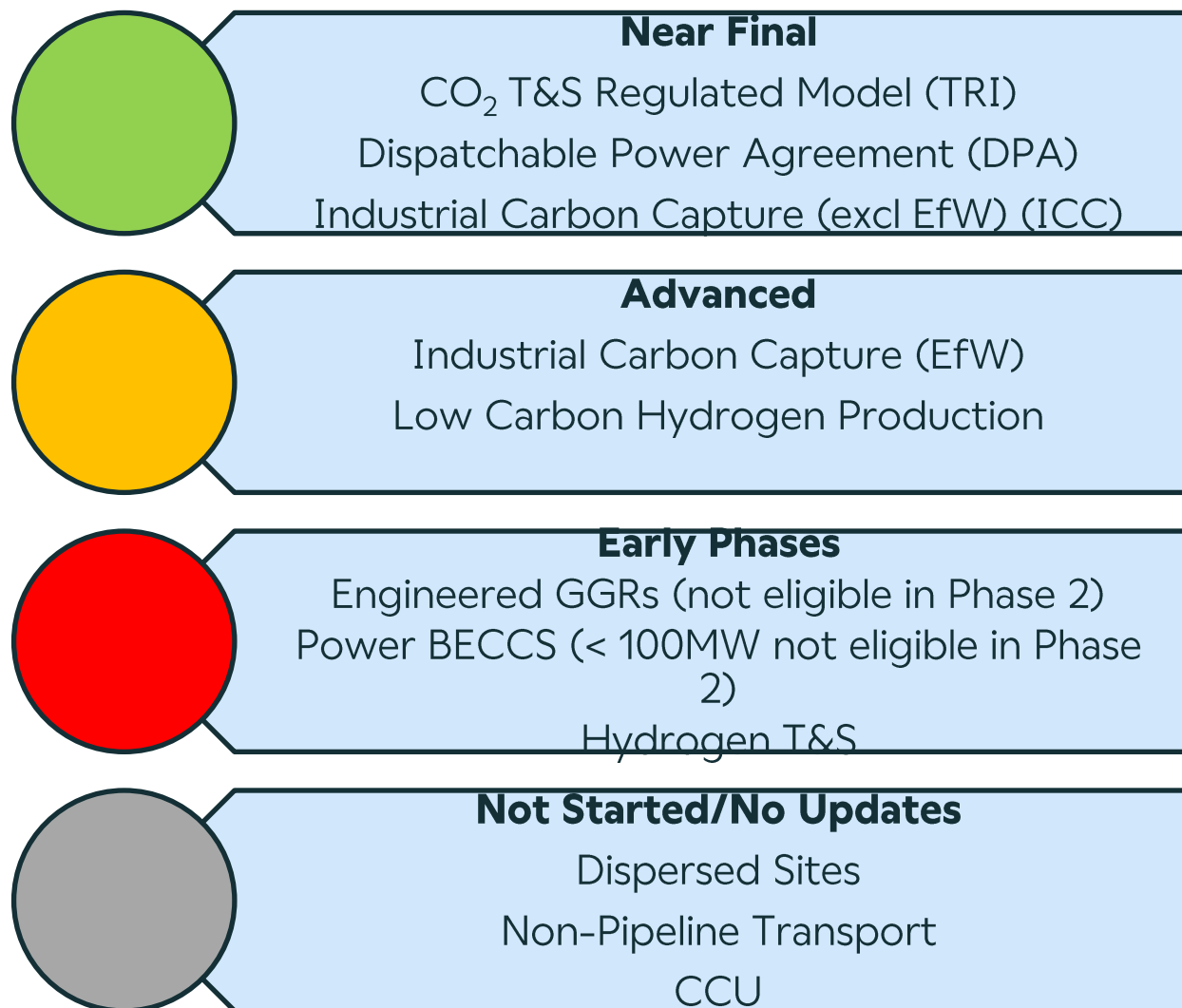


# CO<sub>2</sub> Transport and Storage Regulatory Investment Model



- **User Pays model** – revenues from Transport and Storage (T&S) fees
- **T&S Company (T&SCo)** – owns and operates both the onshore and offshore network
- **Govt. Support Package (GSP)** – offers protection for high impact, low probability risks
- **Economic Regulatory Regime (ERR)** – transparent, predictable model

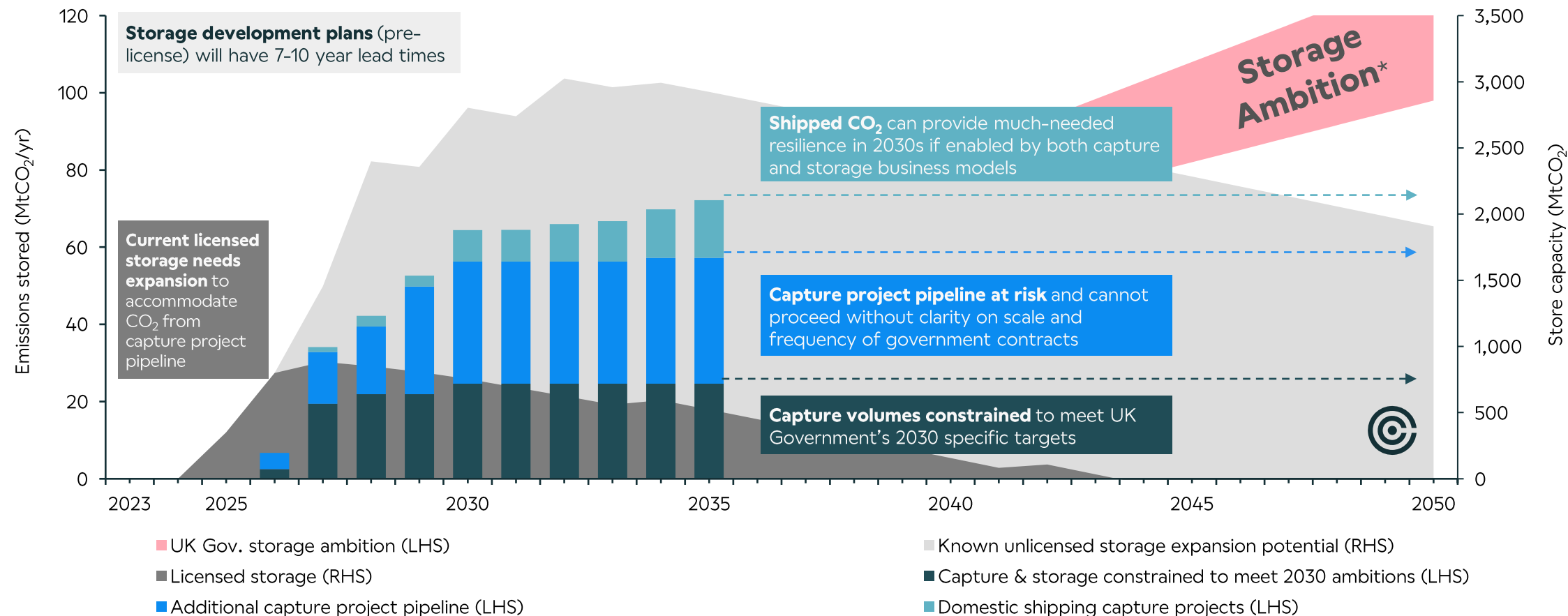
# State of Play across the CCUS Business Models



# Industry can meet the UK's 2035 ambition of over 50Mtpa captured and stored



Constrained and additional emitter volumes and store capacity over time as of 31 March 2022 – ‘Enabling industry pipeline’ scenario

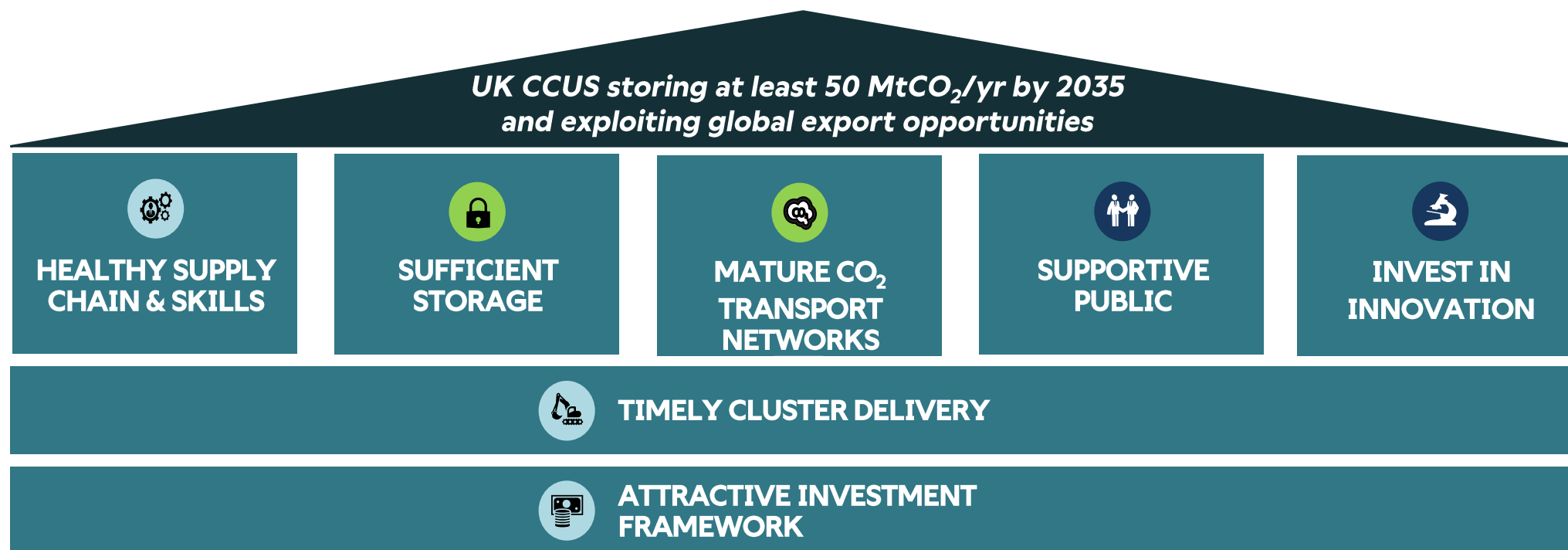


Notes: Emitter and storage data based on a mixture of publicly available information and information from projects. The timelines shown are indicative and based on an expedient Track-2 process launching this year, potential for FID in 2024 and operational in 2027. Licensed store capacity includes all licensed stores for both Track-1 clusters and other clusters. Unlicensed storage includes store volumes where license applications have been submitted, high confidence storage with a licence pending, or where approvals for licence expansion are required. Capture targets in 2030 and 2035 based on Net Zero Strategy; for 2050 targets refer to CCC targets, showing a range between the 'Tailwinds' and 'Widespread Innovation' scenarios

# CCSA's CCUS Delivery Plan 2035 – building blocks of a successful CCUS industry



- Enablers for achieving UK Government's 2035 CCUS ambition, to remain on track for Net Zero by 2050



# Recent UK industry developments



## Cluster Development

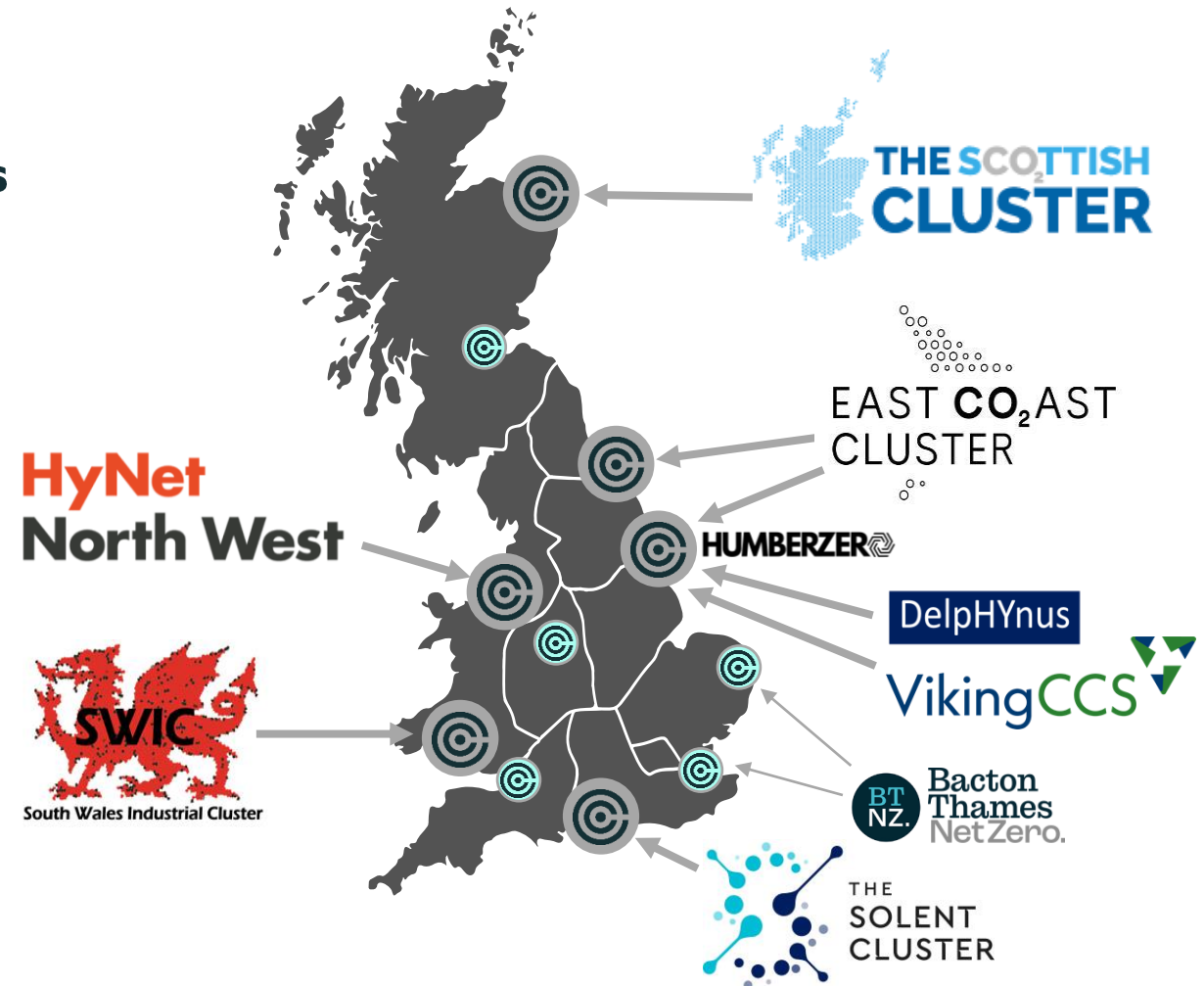
Over the last 12 months we have seen:

- Launch of the **Solent Cluster** and **Bacton Thames Hub**
- Hubs of emitters emerging that will rely on CO<sub>2</sub> shipping, such as **Net Zero Industry Wales** and **7CO<sub>2</sub> capture and transport hub** in Avonmouth.

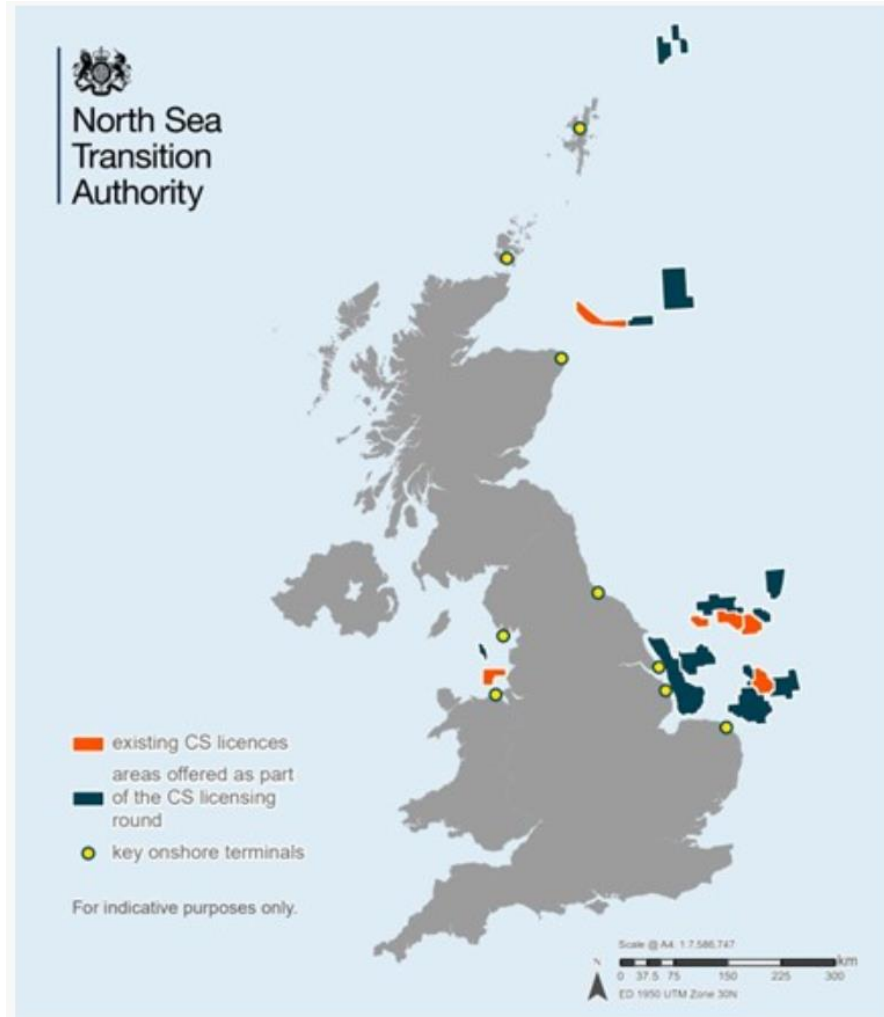
## Commercial Capture projects

Commercial CCU or CCUS projects emerging in cluster regions, e.g.

- **Tata Chemicals** – UK's first industrial-scale CCU plant, capturing 40,000 tonnes of carbon dioxide each year
- **Alfanar Lighthouse Green Fuels Project** (Teeside) – to produce 180 million litres of Sustainable Aviation Fuel (SAF)



# Storage: will the UK's plentiful assets be ready in time?



- The UK and Norway combined have around 85% of Europe's CO<sub>2</sub> storage capacity.
- UK theoretical CO<sub>2</sub> storage capacity is 78Gt – equivalent to 1,000 years of UK industrial emissions
- UK has 6 licensed stores progressing towards CO<sub>2</sub> storage permits
- The NSTA's recent storage licensing round will allocate a further 13 licenses for potential CO<sub>2</sub> storage sites.
- Lead in times from licence award to operation of stores vary according to type of store (~7 years)

## Key challenge:

How to incentivise early investment in development of stores (£10ms for test injection wells).

# Spring Budget 2023

The Chancellor of the Exchequer confirmed the government will provide **up to £20bn funding for early deployment** of CCUS.

## Track 1

- **Phase 2 competition outcome** – the final list of capture projects to be the first to move to deployment will be announced **later this month**.
- **Track 1 Expansion** – a new process whereby further projects would be able to enter a selection process for “Track 1 expansion”, launching **this year**.

## Track 2

- The Chancellor confirmed that **two additional clusters will be selected through a Track 2 process**, with details announced shortly.

*“This unprecedented level of funding in the UK will unlock private investment and job creation across the UK, particularly on the East Coast and in the Northwest of England and North Wales, delivering up to 50,000 highly skilled jobs”.*

## Budget 2023: Jeremy Hunt to announce £20bn over 20 years for carbon capture and clean energy

Jeremy Hunt will also reclassify nuclear energy as ‘environmentally sustainable’ as part of efforts to boost UK’s homegrown energy supply and keep bills low



# Contents:

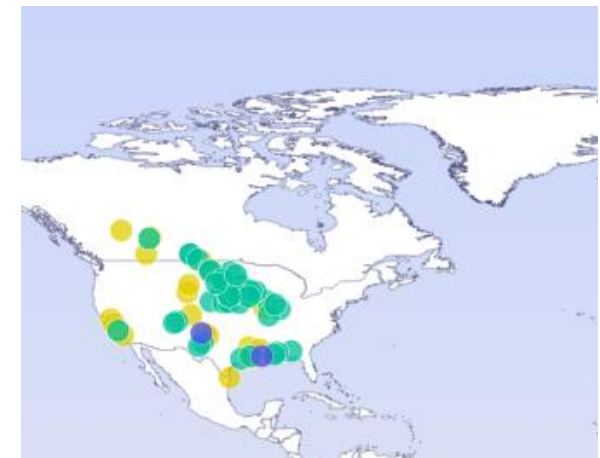
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## Key policy developments

- **US Inflation Reduction Act (US)** signed into law (Aug 22) enacted from 1 January 2023 includes enhancements to internal revenue service section 45Q
- US tax credits worth **US \$369 billion now available** for climate and energy – including CCS, CCU and low-carbon hydrogen production.
- **US Infrastructure investment and jobs Act** includes over **US \$12 billion** to be spent on CCS over the next five years.
- **Canada's** 2022 Federal budget supports CCUS via an investment tax credit of 60% for DACC projects, 50% for all other carbon capture projects, and 37.5% for transportation, storage and use.



● OPERATIONAL



● EARLY DEVELOPMENT ● ADVANCED DEVELOPMENT ● IN CONSTRUCTION

Source: GCCSI

# The Green Deal Industrial Plan – EC response to US IRA

## 1. Predictable and simplified regulatory environment – Net-Zero Industry Act

- 2030 goals for clean technology → Target **annual injection capacity of 50Mtpa by 2030** in EU storage sites, with oil and gas licensees to contribute to meeting this.
- One-stop-shop on permitting, simple criteria to identify net-zero supply chain projects of common interest
- European standards, regulatory sandboxes
- Supply chain: Energy, and Critical raw materials

## 2. Faster access to sufficient funding

- National level: further relaxing state aid rules (Crisis/Transition): renewables, decarbonising industry, strategic technologies, major new production projects, Increase notification thresholds – IPCEI
- EU level: RePowerEU (permitting, tax breaks, skills), InvestEU, Innovation Fund, TEN-E/TEN-T, Sovereignty fund – simplification/frontloading

## 3. Skills to make the transition happen

## 4. Open trade for resilient supply chains

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# Summary

- Deployment of CCUS is beginning to accelerate around the world
- There is now a global race to corner the low carbon products market and related supply chain which includes CCUS
- UK ETS reduction of free allowances from 2028 and similar developments under the EU ETS likely to push up demand for the UK's CO<sub>2</sub> storage towards the end of this decade
- Those who have already started to plan access to T&S capacity will be most likely to be able to use carbon capture and storage to offset ETS liabilities
- Companies who are already investing in project development are most likely to be ready to benefit from support schemes for CCUS
- The next opportunity to apply for access to UK government support via CCUS business models is expected later this year.

# Questions

or email [info@ccsassociation.org](mailto:info@ccsassociation.org)

