

# Next steps for CCUS in the UK

Luke Warren  
Carbon Capture and Storage Association

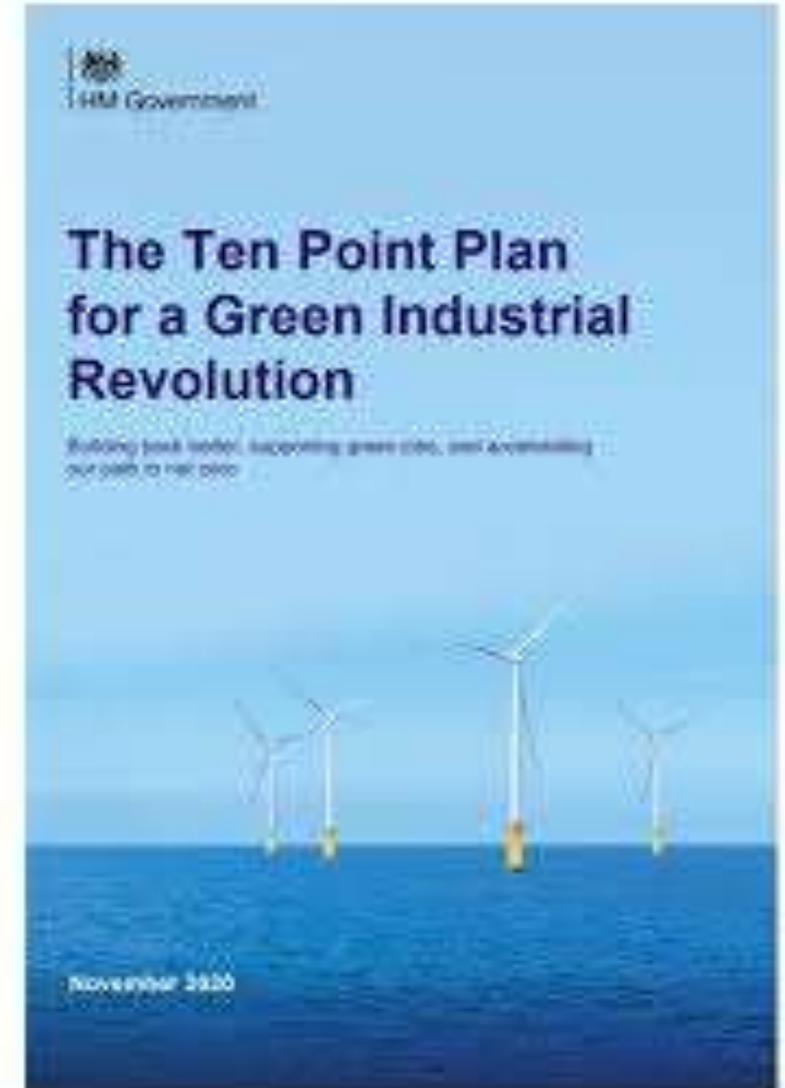
UKCCSRC webinar  
3<sup>rd</sup> February 2021



# Government CCUS Strategy

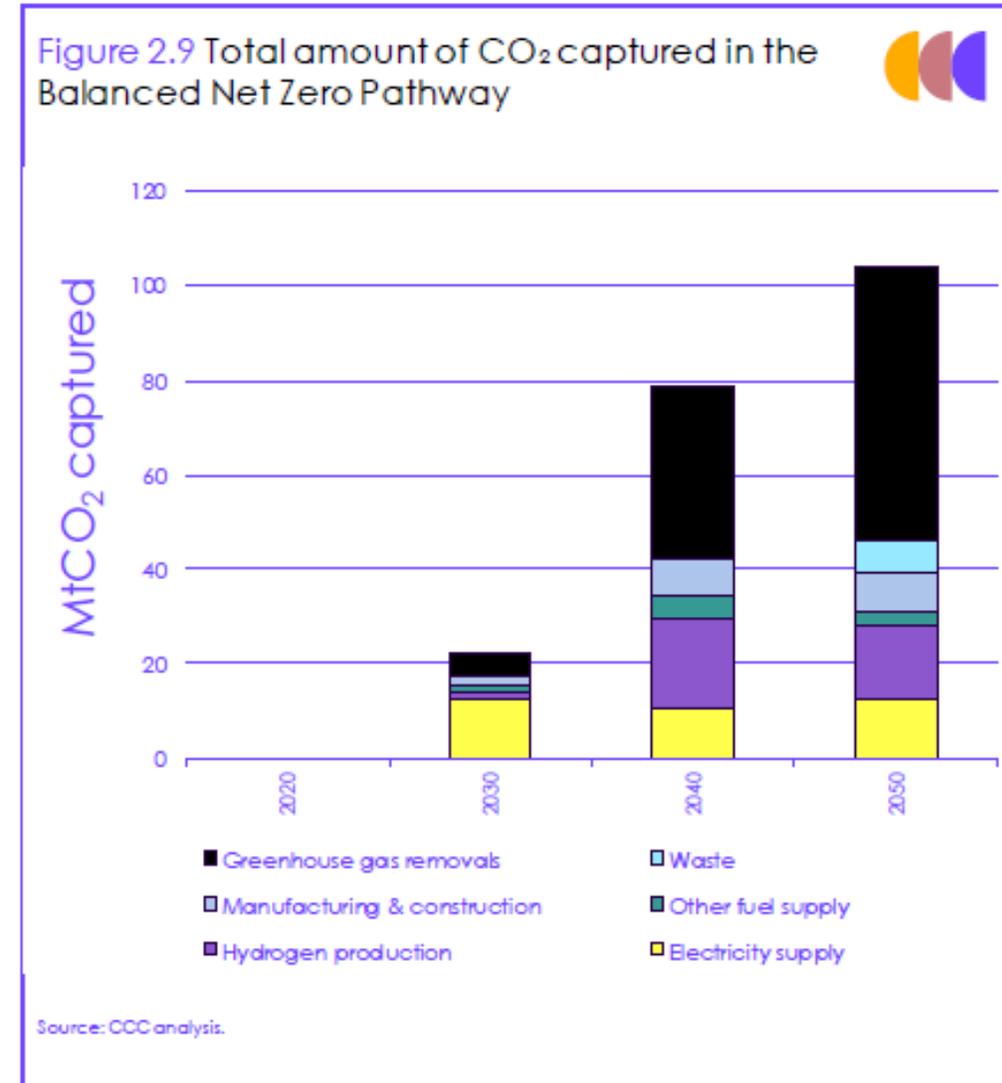
- Introduced an ambition to capture 10 MtCO<sub>2</sub> a year by 2030
- Four CCUS clusters with two operating by the mid-2020s and another two by 2030
- An extra £200m for the CCS Infrastructure Fund (CIF), now totalling £1bn
- Aim of having 5GW of hydrogen production capacity by 2030 with an interim goal of 1GW by 2025. Aided by a £240m Net Zero Hydrogen Fund

Investing in carbon capture usage and storage could potentially deliver...		
Support for around <b>50,000 jobs</b> by 2030 <sup>3</sup>	Up to <b>£1.bn</b> of public investment by 2025	Savings of around <b>40MtCO<sub>2</sub>e</b> between 2023 and 2032, or <b>9%</b> of 2018 UK emissions



# CCC 6<sup>th</sup> Carbon Budget Advice

- The UK needs to establish;
  - At least two CCS clusters in the mid-2020s, at least four by the late 2020s, and further clusters around 2030.
  - Commercial scale hydrogen and ammonia production, and GHG removal plants operational.
- The UK will require 75-180Mt of CO<sub>2</sub> storage pa by 2050
- In the Balanced Net Zero Pathway, the UK requires 104Mt of CO<sub>2</sub> storage pa by 2050.
  - 22Mt pa in 2030
  - 53Mt pa in 2035
  - 79Mt pa by 2040.



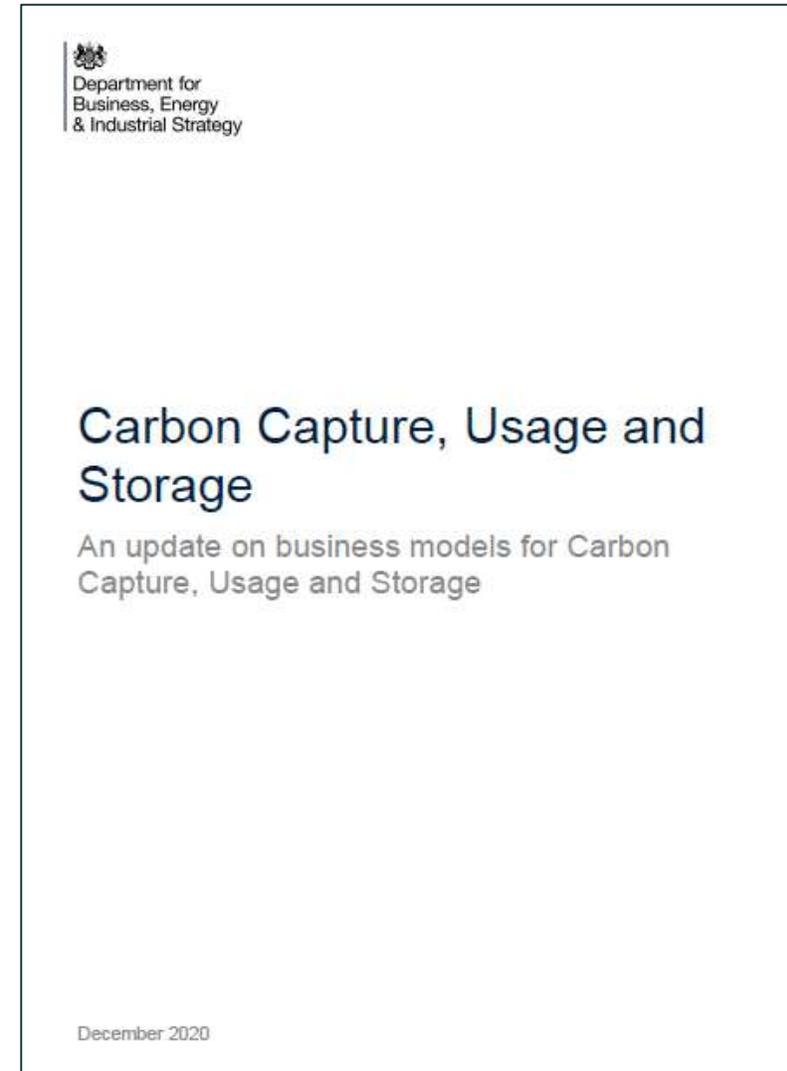
# BEIS Update on CCUS Business Models

## CCUS Programme Objectives

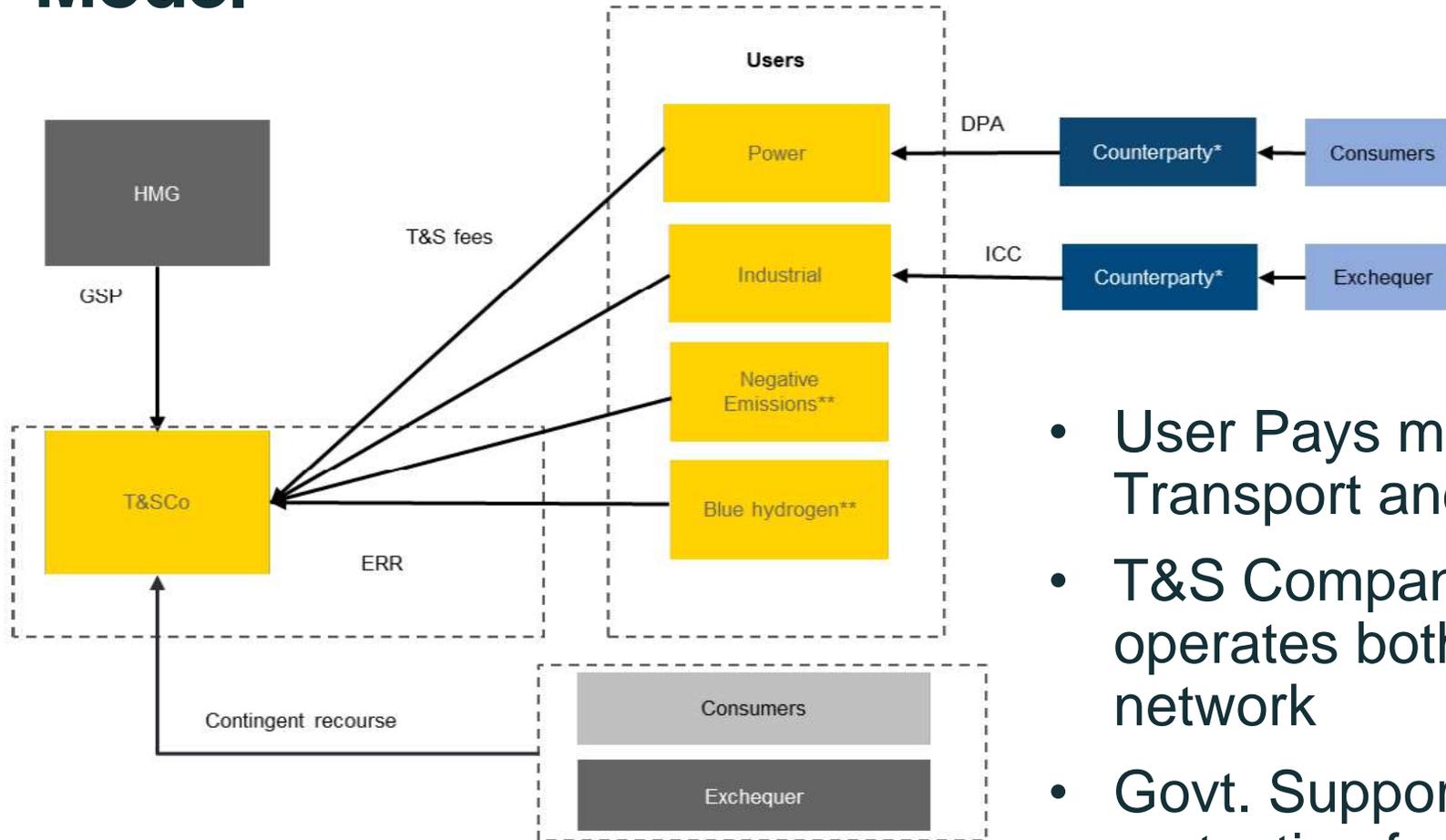
1. Establishing a new CCUS sector
2. Enabling low-cost decarbonisation in multiple sectors
3. Developing a market for carbon capture

## Business Model updates on;

- CO<sub>2</sub> Transport and Storage Regulatory Investment Model (TRI)
- Dispatchable Power Agreement (DPA) for power CCUS
- Industrial Carbon Capture (ICC) contract



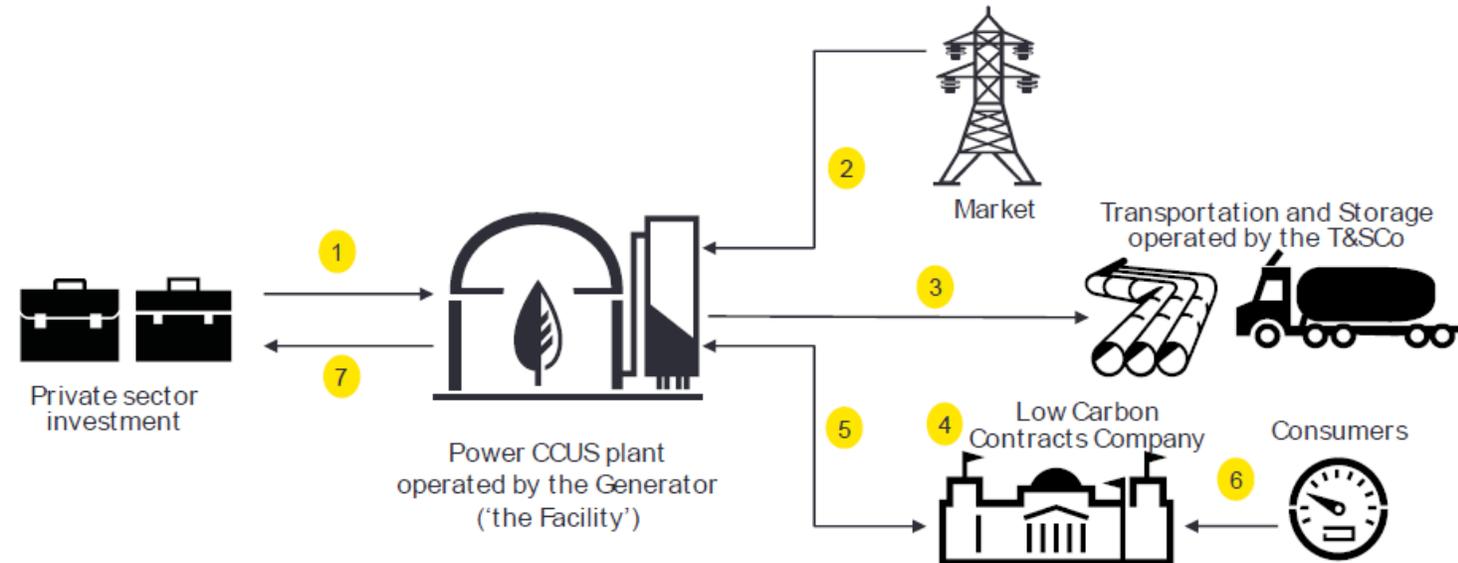
# CO<sub>2</sub> Transport and Storage Regulatory Investment Model



- 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) – 5

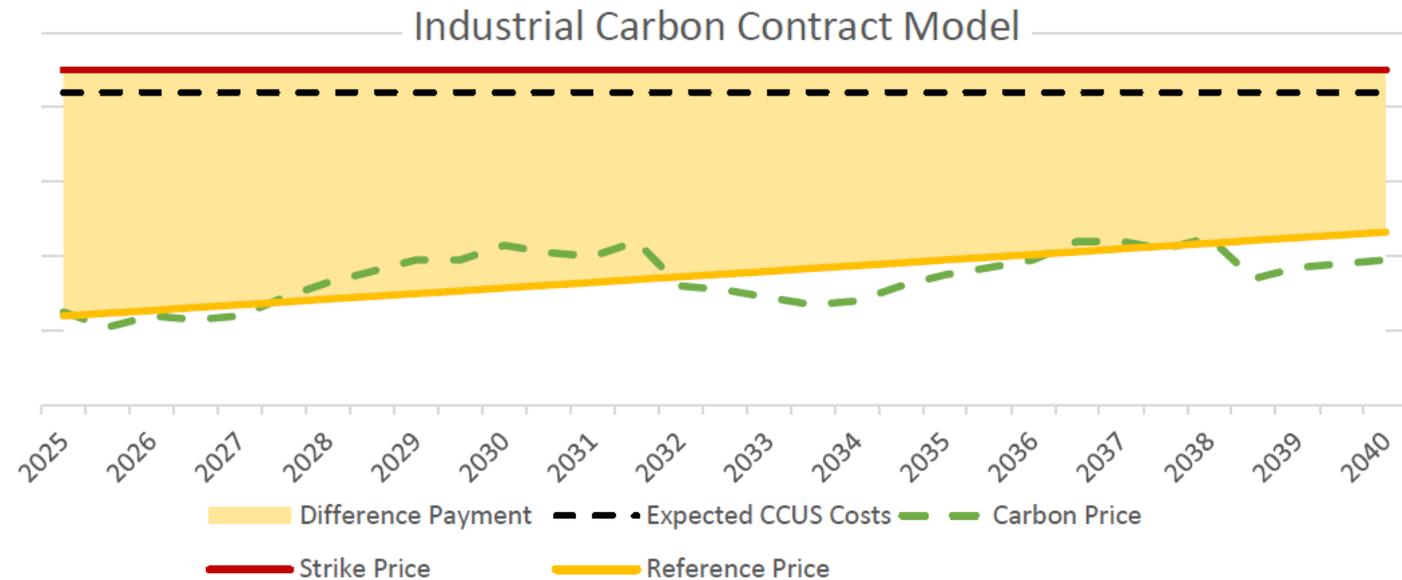
# Dispatchable Power Agreement (DPA) for power CCUS

1. Private sector investment and construction of facility with carbon capture technology
2. The Power CCUS Plant provides dispatchable, low carbon power at the market price in the wholesale and balancing markets and provides ancillary services to the Electricity System Operator
3. The Generator pays T&SCo T&S fees for captured carbon
4. LCCC acts as counterparty to the DPA
5. DPA provides the Generator with payments comprising of an availability and variable payment
6. Consumer subsidy funds availability and variable payment
7. Return on investment back to private sector



# Industrial Carbon Capture (ICC) contract

- ICC contract – overall duration of 15 years possibly profiled (10 + 5 yrs)
- Negotiated bi-laterally for initial projects
- Govt. capital co-funding available for the initial projects
- Subsidy reduces as carbon prices rise and low-carbon product markets emerge



# CCUS Business Models – initial reactions



- Good progress & strong foundation – critical now to address details & enable projects to progress

## **CO<sub>2</sub> TRI Model**

- Provides a clear vision for the future of UK CO<sub>2</sub> T&S infrastructure
- Overall the revenue structure and risk allocation seems sensible – key details still required, e.g. utilisation risk, allowed returns, capital recovery, etc
- Draws heavily on existing regulated networks in mature industries – may need adjusting for FOAK CCUS
- Government Support Package welcomed – proposes approach to address some key CCUS risks

## **Power DPA**

- Good progress on the model – very detailed Heads of Terms annex – desire to work on details now
- Model focussed on mid-merit plant (e.g. gas & hydrogen) – need models for other generation sources, e.g. BECCS, CHP, EfW, etc.

## **Industrial ICC**

- Good progress, not as advanced as DPA - key issues outstanding, e.g. Reference price, free allowances.
- Further consideration: capture plant boundary, supporting new plant investment, dispersed sites, etc

## **Hydrogen**

- Consult Q2 on business models – completed by 2022

# Greenhouse Gas Removal (GGR) Policy

- Government are beginning evidence gathering to inform GGR policy, with two open 'Call for Evidences' on GGRs
- It is clear that engineered solutions (BECCS, DACCS and minor wood in construction) will play a critical role if the UK is to achieve net zero. With the CCC estimating 45-112Mt of engineer removals per year needed in 2050.
- The Calls for Evidence are broadly split into three themes:
  1. Technical and cost evidence gathering on all GGR technologies including BECCS and DACCS
  2. Incentivising investment and market mechanisms, investigating what policy mechanisms would help deploy a GGR sector
  3. Supportive and enabling policies to ensure critical BECCS and DACCS projects can deploy.
- The consultations do not sub-categorise BECCS into individual components (e.g. BECCS in power production, hydrogen production, bioethanol , EfW...)
- The development of investable business models for GGRs is much further behind that other CCUS busines models



# Funding available for CCUS projects

CCUS Infrastructure Fund (£1bn) 2022-2024/5	Net Zero Hydrogen Fund (£240m) ?	Industrial Decarbonisation Challenge (£170m) 2019-2024
Industrial Energy Transformation Fund (£289m) 2020-2024	UKRI GGR Demonstration Programme (£30m) 2020-2024	BEIS DAC and GGR Innovation Programme (£70m) 2020-2024
Clean Steel Fund (£250m) 2023-2027	Scotland low-carbon hydrogen production fund (£100m) 2021-2026	Additional IETF Funds (£500m) 2024-2028

# CCUS Supply Chain

Ten Point Plan – announcements made in context of contribution to “Building back better, supporting green jobs”

- Attraction CCUS is perception that well aligned with these goals
- CCUS supply chain – central priority for BEIS, key part of the strategic case for CCUS investment
- Expected to be an enduring priority – extensive set of activities be progressed alongside the deployment of clusters



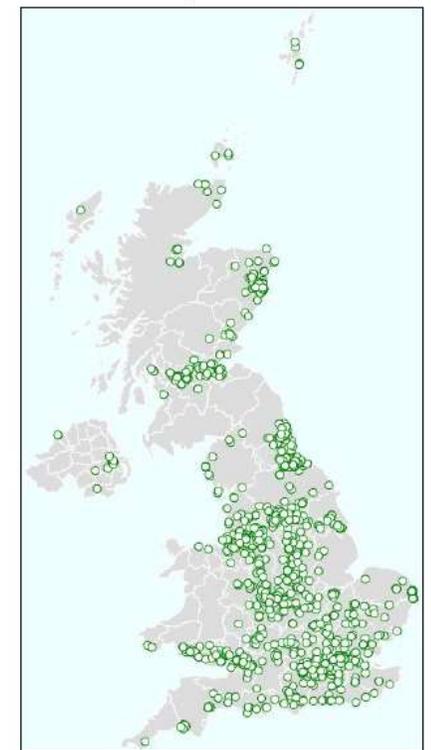
Wells

Pipelines

CCSA / EIC collaboration – UK Supply Chain capabilities, released October 2020

CCUS Council – adopted ToR for programme to identify the UK opportunities and develop strategies that deliver

- CCSA established a Supply Chain Working Group to progress this in early 2021
- Will collaborate with other initiatives, North Sea Transition Deal, Offshore Wind arrangements, etc



# Forward milestones

No	CCUS and related policies	Indicative date
1	Cluster consultation	Q1/2 2021
2	Hydrogen Business Model consultation	Q2_2021
3	TRI Model update (including revenue model, ERR and GSP)	Q2 2021
4	DPA Model update	Q2 2021
5	Industrial Carbon Capture business model update	Q2 2021
6	Supply chain plan	Q2 2021
7	T&S decommissioning regime	Q3 2021
8	Biomass Strategy Position Paper	Q3 2021
9	CCUS Regulatory framework update	Q3 2021
10	T&S connection arrangements	Q3 2021