CCSA response to the NIC
National Infrastructure Assessment Baseline Report

4th February 2022

The Carbon Capture and Storage Association (CCSA) is pleased to provide a response to the National Infrastructure Commission's Call for Evidence for the Infrastructure Assessment: Baseline Report. The CCSA brings together a wide range of specialist companies across the spectrum of Carbon Capture, Utilisation and Storage (CCUS) technology, as well as a variety of support services to the energy sector. The CCSA exists to represent the interests of its members in promoting the business of CCUS and to assist policy developments in the UK, EU and internationally to support the commercial deployment of CCUS.

Questions answered by the CCSA

Question 1: Do the nine challenges identified by the Commission cover the most pressing issues that economic infrastructure will face over the next 30 years? If not, what other challenges should the Commission consider?

The CCSA agree with the proposed challenges identified by the Commission over the next 30 years. We welcome the consideration for CO2 networks and decarbonised energy.

One area which will become increasingly prevalent as the UK heads towards net zero is the need for standalone consideration for carbon removals. The challenges categorise engineered removals under CO2 networks, however, as noted in the NIC's 2021 report[1] on engineered removals, considerations for this vital sector will extend beyond just CO2 infrastructure, and will need to be integrated into the wider energy and climate system.

The CCC note that by 2050, the majority of CO2 stored in the UK will be carbon removals (~60Mt per year in 2050)[2]. Given the critical role carbon removal technologies will play to ensure net zero can be achieved, there is merit in considering GGRs as a standalone challenge. In addition to CCS enabled GGRs, this would allow for cross sector coordination across the suite of GGR technologies and wider systems.

Finally, the CCSA would been keen to highlight that the implementation of large regional CCUS projects can provide a key catalyst to a regional levelling up agenda. As the Challenges are currently presented, levelling up focusses on transport modes and mobility, which are valid observations, however this does present levelling up in a narrow way. The CCSA believe the links between levelling up and CCUS and hydrogen projects are clear and vital to focus on. As CCSA modelling shows, for a 22Mt 2030 CO2 storage per year scenario, 10,000 jobs could be created by 2025, and 50,000 jobs protected[3].

Question 2: What changes to funding policy help address the Commission's nine challenges and what evidence is there to support this? Your response can cover any number of the Commission's challenges.

There are three main areas where improvements to funding policy can accelerate the deployment of enabling CO2 infrastructure and decarbonisation of industry and power:

[1]National Infrastructure Commission, 2021. Engineered greenhouse gas removals

[2] Climate Change Committee, 2020. The Sixth Carbon Budget – The UK's path to Net Zero. Available at: https://www.theccc.org.uk/wp-content/uploads/2020/12/The-Sixth-Carbon-Budget-The-UKs-path-to-Net-Zero.pdf

[3] Carbon Capture and Storage Association, 2021. Economic analysis of UK CCUS. Available upon request at: info@CCSassociation.org [executive summary: https://www.ccsassociation.org/resources/download?id=1172]

- **Providing long-term funding support**: As shown in the deployment of the Levy Control Framework, providing a long-term funding framework to support the business models for an emerging sector is critical to allowing a strong pipeline of projects to materialise and facilitate investor and supply chain confidence in the sector. The Government have committed to outlining a funding envelope for industrial carbon capture and hydrogen in 2022, it is essential that this funding level is proportionate to allow projects to come forward to access funding out to 2030. The CCSA analysis on the Economics of UK CCUS in 2021 noted that a funding framework is the largest gap in CCUS success when compared to the deployment of offshore wind.

- **Providing funding throughout the project lifecycle**: For FOAK and early projects to move from concept to deployment and operation, a clear route to market is required. For early CCUS projects, this often requires degrees of Government support and commitments through pre-feasibility, feasibility, FEED, Capex and Opex. As CCUS can potentially cover so many applications and sectors, funding has the potential to become segmented and disjointed.

Whilst funds like the Industrial Decarbonisation Challenge have been instrumental in bringing forward projects into FEED studies, there is no clear pathway forward for its successor and the next phase of CCUS project deployment. Support through funds like the Industrial Energy Transformation Fund and the Net Zero Hydrogen Fund has been welcome and supports many industries, this however does present a complex, often segmented approach with some sectors (such as Energy-from-Waste or novel capture technologies) falling between funding pots and not having as clear or any funding support compared to other sectors. The IETF focuses only on-site industrial technologies and excludes applications from Transportation and Storage projects and yet these form an integral part of the chain for the deep decarbonisation of all sectors. If the funding pathway is not clear, this presents funding gaps where companies may struggle to pass funding decisions, especially given the competitive (i.e., not guaranteed) nature of applying to access CO2 infrastructure. This creates an unlevel playing field in a competitive environment, risks the development of a strong pipeline of projects from a whole sector and sends a confusing message to industry.

- **Front-loading funding**: The Government approach to funding CCUS has centred on a cluster sequencing process, which looks to deploy two clusters operational by the mid-2020s (Track-1) and two more by 2030 (Track 2). The updated ambition of the net zero strategy is for 20-30Mt per year of CO2 to be stored by 2030, with at least 10Mt of that coming from the 'Track 2' clusters.

In addition, the Phased process of access to the chosen Track 1 infrastructure has attracted a high amount of industry interest. This however could also result in many applicants not receiving support in Phase 2. In addition, the gap between Track 1 and Track 2 cluster sequencing could also result in Track 2 clusters not receiving the support and finance they require to maintain course. Even with the IETF, which offers segmented funding, there are limited funding opportunities to support the full chain including Transportation and Storage With an uncertain and highly risky pathway to access funding support and infrastructure in the future, these projects may not materialise for future phases.

By front-loading funding support for CCUS projects and Track-2 clusters, this could accelerate the deployment of CCUS, increase industry confidence, decrease early user risk of the CO2 networks, accelerate cost reductions for future support phases, establish the UK as a global leader on CCUS and importantly prevent more emissions of CO2 to atmosphere. As noted in the recent discussion paper

from the UK Infrastructure Bank, the UKIB and NIC can have an important role to play in the acceleration of CO2 network deployment[4].

Question 12: What are the main barriers to delivering the carbon capture and storage networks required to support the transition to a net zero economy? What are the solutions to overcoming these barriers?

Government ambition on CCUS is clear, with the Net Zero Strategy providing key milestones for 20-30Mt of CO2 storage per year by 2030, increasing to 50Mt per year by 2035, as well as a number of commitments for capture of CO2 across a multitude of CO2 sources, including industry and engineered GGRs.

The CCSA welcome this increased ambition, what is now required is a comprehensive 10-20 year funding and policy framework which can deliver CCUS cluster projects at pace in the 2020s. This will provide the clarity that is required for private sector investors and the supply chain on the future pipeline of projects and lead-in times that are required. Visibility on the roll out programme of CCUS in the UK is also key to attracting inward investment from overseas.

The main barriers to the deployment of a CCUS sector at the scale require to achieve net zero and the intermediate targets are:

- **A strong pipeline of projects fails to maintain through the 2020s and beyond**:

BEIS announced the Track-1 CCUS clusters in 2021, however, to ensure the industry can deploy at scale, a strong pipeline of projects; both capture and storage projects will be needed in the 2020s which will expand from 2030. The industry currently has many projects looking to progress, what is vital is that Government provides certainty across three main areas:

1. *Clarity on future cluster sequencing phases and infrastructure development*

   Outside of the Track-1 and Phase-2 process for CCUS deployment, there is little clarity on the future allocation process and timelines for both the next stage of infrastructure development (Track-2) or future opportunities to access announced infrastructure. It is critical that industry can see the forward timeline for these processes to allow for applications in keeping with business timelines. At the moment, for unsuccessful clusters and capture projects or those looking to deploy later in the 2020s and beyond, the forward timelines are unknown, without clarity this will prevent projects and the supply chain materialising.

2. *A long-term funding envelope to support the business models*

   As noted in response to Question 2, it is critical that the CCUS industry is supported by a long-term funding framework, detailing future allocation rounds, through the business models. The Government have committed to outlining a funding envelope for industrial carbon capture and hydrogen in 2022, it is critical that this funding level is proportionate to allow projects to come forward to access funding out to 2030. The CCSA analysis on the Economics of UK CCUS in

[4] UK Infrastructure Bank, 2022. Discussion paper: Potential Private Sector Opportunities in Priority Sectors. Available at: https://www.ukib.org.uk/sites/default/files/2022-01/UK%20Infrastructure%20Bank%20discussion%20paper%20-%20Potential%20private%20sector%20opportunities%20in%20priority%20sectors%20Jan%202022.pdf

2021 noted that a funding framework is the largest gap in CCUS success compared to the deployment of offshore wind.

Without a proportionate framework in place, a strong pipeline of projects would not materialise as companies will not be able to justify investment with an uncertainty around the business model funding envelope throughout the contract.

3. *A clear funding framework mapped against the deployment timelines for projects*

Again, as noted in response to Question 2, it is vital that for FOAK and early CCUS projects companies are supported by a funding framework which can facilitate projects and technologies to move to deployment and market. As CCUS can potentially cover so many applications and sectors, funding has the potential to become segmented and disjointed. If this funding timeline presents funding gaps, projects may struggle to pass internal investment decisions, preventing projects moving towards deployment.

- **Uncoordinated and delayed deployment of net zero infrastructure**:

The interaction between offshore wind and CCUS in an increasingly crowded marine space was highlighted in the recently published Offshore Wind and CCUS Overlap study "*it is anticipated that there will be a number of areas that will require infrastructure in the same location*"[5].

The most pressing matter is that for a CO2 storage site to abide by the storage permit, the storage operator must frequently monitor and verify the CO2 in the subsurface before, during and for a period after injection of CO2 – monitoring today is most commonly done using a seismic surveying vessel towing receivers. This survey will need to traverse the whole storage complex, which could cover the same seabed favourable for offshore wind arrays. In addition, there are active scenarios where the same area of seabed has been leased by the Crown Estate to two technologies (CCS and offshore wind).

Both technologies can and must be deployed to meet the governments targets on reaching net zero by 2050 and the increased ambition of storing 20-30 million tonnes of CO2 by 2030. To achieve this, there needs to be an overarching net zero marine strategy that considers the needs, deployment pathways and locations of both offshore wind and CCUS.

Furthermore, onshore one of the longest lead time risks is the Development Consent Order (DCO) process for projects, which CCUS projects will require in order to build key infrastructure connecting capture units to storage sites. A DCO process is typically three years in length, with an 18 month examination and determination period. Acceleration of this process would support earlier (and lower cost) deployment of CCUS.

- **The delayed introduction of an overly restrictive regulatory regime**:

The recent publication from BEIS has named Ofgem as the appropriate regulator for the CO2 transport and storage (T&S) networks[6]. It is crucial that the regulator overseas a proportionate regulatory framework, which can enable industry growth and investment.

[5] OREC & NZTC for The Crown Estate, 2021. CCUS & Offshore Wind Overlap Study Report. Available at: https://www.thecrownestate.co.uk/media/3898/ccus-offshore-wind-overlap-study-report.pdf

[6] BEIS 2022. Carbon Capture, Usage and Storage – An update on the business model for Transport and Storage. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1045066/ccus-transport-storage-business-model-jan-2022.pdf

The regulatory structure for CO2 networks is emerging, there are however many items relating to the development of the RAB which will need to be progressed at pace in order for companies to take investment decisions and understand the network code – governing the relationship between asset owners, operators and users. The complex landscape of legal agreements, commercial arrangements, code structures and underlying government supported CO2 capture business models will need to be resolved ahead of FID, which for the first CCUS projects is needed soon to be able to deploy and achieve mid-2020s project operation. Should the implementation of the regulatory framework not be progressed in a timely manner, this would delay the deployment of the sector.

It is also worth highlighting that CCUS is a nascent industry and the transport and storage networks for the CCUS industry are yet to be built and, at least in the first few years of development, are unlikely to form a fully national network. This is clearly a very different starting point to the independent economic regulators in energy, water and telecoms that were established long after these national networks had been built.

For a nascent industry, the development of an appropriate and bespoke framework for the cost of capital and other financial indicators will be key to making the new sector an investable proposition.

Any economic regulatory framework for T&S networks in CCUS must therefore be proportionate to the nature and size of the industry and be designed to facilitate and incentivise significant investment and innovation to ensure rapid deployment and delivery of CCUS infrastructure, particularly in the initial phases. The primary duties of the regulator will need to reflect and enable this. It will also need to be flexible and able to deal with uncertainty and change, as with the reopeners and uncertainty mechanisms in the electricity and gas sectors, to address net zero. It should also be noted that a direct replication of codes from the gas and electricity markets may not be fit for the purpose.