apse association for public service excellence

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National Audit Office value for money report: Carbon Capture, Usage and Storage programme

To: All UK administrations

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1 Executive Summary

The National Audit Office has produced a value for money report into the Government's Carbon Capture, Usage and Storage (CCUS) programme. By 2030, the Department for Energy Security and Net Zero (DESNZ) intends to establish the technology in four industrial areas in the UK, with the aim of capturing and storing 20 to 30 million tonnes of carbon per year, equivalent to removing 4 to 6 million cars from UK roads each year, and supporting 50,000 jobs.

The National Audit Office report examines:

- How DESNZ has taken on the lessons from previous attempts to support CCUS when designing the current programme.
- The progress made by DESNZ with the current programme.
- The key risks and issues that will need to be addressed by the Government to meet its targets for CCUS deployment.

This briefing provides a summary of the report, with the aim of providing local authorities with an insight into CCUS and the potentially critical role the technologies may play in helping the UK transition to net zero emissions.

The full report can be found here.

2 Background

CCUS refers to several technologies which either mitigate carbon emissions from sources such as power plants and industrial facilities or through capturing carbon directly from the air, before being permanently stored either underground or under the seabed, therefore reducing emissions. Usage is an alternative to storing the carbon, where the captured carbon can be used in industrial processes which require carbon to work. CCUS has the potential to support decarbonisation across several sectors of the economy and may be the only way to decarbonise certain industrial processes where carbon emissions are unavoidable such as cement production.

There are three main types of CCUS technology:

1. Post combustion: Fossil fuels are burnt and solvents are used to extract the CO2 from the resultant gases.
2. Oxy-fuel combustion: Fuel is burnt in oxygen rather than air, thereby producing a flue gas of water vapour and CO2.
3. Direct air capture: CO2 is extracted directly from the air.

DESNZ and the Climate Change Committee (CCC) have both described CCUS as being 'essential' to achieving net zero; the Government does not have an alternative pathway to reaching net zero without CCUS, whilst CCUS also features in each of the CCC's pathways to net zero in its Sixth Carbon Budget.

Prior to the current programme, the UK Government has unsuccessfully attempted to launch two previous carbon capture, Usage and storage programmes, in 2011 and 2016. The failure of these schemes dented industry confidence in the Government's commitment to CCUS. The National Audit Office (NAO) concluded that these attempts had failed as a result of a lack of planning by the government and a failure to recognise the significant commercial risks associated with CCUS.

The current CCUS programme is led by DESNZ and aims to establish the technology in four industrial areas, known as 'clusters', across the UK, with the target of storing 20 to 30 million tonnes of carbon per year by 2030. In 2023, the first two clusters were identified, with the first spanning across north-west England and north Wales, whilst the second is to cover Humberside and Teesside. Eight emitter projects have been shortlisted to be covered by these clusters and DESNZ is currently conducting commercial negotiations with these projects. DESNZ intends to launch two further clusters in Peterhead and in Humberside.

3 Key findings from the report

3.1 Setting up the CCUS programme

- The report highlights that if the Government is to be successful in deploying commercial-scale CCUS facilities, it must manage a range of risks. Risks surrounding uncertainties around the potential capacity and performance of storage sites and defining and agreeing allocation of risk between the Government and private investors, as well as between companies involved in projects, will be crucial to the success of the programme.

- In relation to learning the lessons of the previous failed attempts to set up CCUS, the report states that these lessons have been identified and addressed within the current approach. For example, DESNZ identified that a major factor in the failure of previous attempts to launch CCUS was that projects had to handle all steps in the CCUS chain, meaning that issues within any part of the process would have a knock-on effect and could derail the entire project. To mitigate this, the new approach splits the transport and storage functions away from the emitter projects, allowing for specific risks to be allocated to the relevant parts of the chain.

- In response to lessons from past failings, DESNZ and HM Treasury have committed up to £20bilion to the early deployment of CCUS. DESNZ aims to create a "self-sustaining CCUS market" by 2035. However, NAO found that there is uncertainty around the funding that will be available for future stages for the programme, adding that HM Treasury will be required to play a key role in ensuring that there is a clear plan for funding for the CCUS programme.

- When the design process of the current CCUS programme began in 2018, the Government's ambition was to reduce carbon emissions by 80% by 2050. At that time, the Government aimed to have the option to 'deploy CCUS at scale during the 2030s'. However, in 2019, the Government's 2050 net zero target was established which led to DESNZ increasing its reliance on CCUS with the adoption of ambitions to deploy carbon capture by 2030. The NAO report found that despite these changes to Government ambition, DESNZ has not fully considered whether this should result in changes to the programme's design.

3.2 Progress to date

- To date, £630 million has been spent on the CCUS programme by the Government, with this primarily made up of grants to support the early development of projects.

- DESNZ is behind schedule in agreeing support for the first two CCUS clusters. It originally aimed to have these clusters operational by the mid-2020s. However, this has been downgraded to "supporting" two clusters by the mid-2020s. DESNZ has delayed the Final Investment Decision for the first two clusters to September 2024, which is 9-months later than originally planned.

- Delivery constraints in one of the clusters has led to DESNZ reducing the amount of carbon that it expects the first two clusters to store.

- The CCUS programme has attracted significant investment from the private sector, DESNZ states that this has been a result of its creation of business models that allocate costs and risks between government and investors.

- HM Treasury and DESNZ are developing a framework to assess the value for money of the first two CCUS clusters to decide whether to award them with Government support. It has been made clear that the Government's Final Investment Decision will be subject to value for money assessments. As well as financial considerations, the Government will also need to consider the potential downsides of not awarding support such as increasing the likelihood of the Government's failing to reach its net zero targets.

3.3 Future risks to manage

- The future progress of the CCUS programme is heavily dependent on reaching Final Investment Decisions for projects within the first two clusters. In 2016, the cancellation of the previous CCUS programme had a significant impact on the confidence of investors to work with the government on CCUS. Not reaching decisions on the projects within the first two clusters could result in a similar outcome and therefore, it is important for the government to ensure that investors are confident that they will see a return on their investment in CCUS.

- Following the achievement of a Final Investment Decision, new risks for DESNZ will emerge as the programme moves into the next stage of implementation such as the technical issues surrounding the installation of carbon capture facilities, uncertainty surrounding proposed methods and the efficacy of solvents.

- The report states that as a result of the slower than expected progress so far, DESNZ will struggle to achieve its 2030 ambitions for carbon capture.

4 Report recommendations

The report includes a number of recommendations to DESNZ and HM Treasury which are included below.

4.1.1 DESNZ and HM Treasury should:

- Ensure that the criteria for considering value for money, ahead of deciding whether to proceed with Government support for the Track-1 projects, considers the follow-on benefits that will be achieved by launching a new technology in the UK.

- Consider which sectors of the UK economy are most reliant on CCUS to decarbonise and what viable alternative means of decarbonisation may be available for the UK to achieve net zero.

- In light of the outcome of Track-1 negotiations and prior to commencing negotiations on Track-1 expansion, consider what actions the Government needs to take to sustain investor confidence in the CCUS programme. This might include agreeing and communicating indicative funding available for Track-1 expansion and Track-2.

4.1.2 DESNZ should:

- Identify lessons from its Track-1 negotiations, particularly relating to business models, resourcing and maintaining competitive tension, and ensure that these are carried over to its subsequent work on Track-1 expansion and Track-2.

- Ensure it maintains sufficient oversight of the progress of Track-1 projects during construction and operation so that it can identify early any issues arising that impact on the CCUS programme's objectives, such as delays to construction or lower-than-planned injection capacity, and so that it can draw technical and commercial lessons that can inform projects in later stages of the programme.

- Ensure that the scale and timing of these next steps are achievable, given the resources available to it and, in turn, whether this enables the CCUS programme to achieve the emissions reductions required under Carbon Budget 6.

5 APSE Comment

Although the CCUS programme is not directly related to the day-to-day work of local authorities, DESNZ and the Climate Change Committee have described CCUS as being 'essential' to reaching net zero emissions, something which is underlined by the fact that the Government does not have a credible pathway to reaching net zero by 2050 without the implementation of CCUS.

Though CCUS is unlikely to be mainstream in nearly all UK local authorities, nature-based solutions for removal of greenhouse gases from the atmosphere have scaled up considerably at a local level – namely with the proliferation of local council trees, woodlands and biodiversity strategies. In February 2023, Natural England announced six projects would receive funding to research how nature-rich woodlands, grasslands, wetlands and urban habitats take up carbon; indicative of the huge role nature-based carbon-capture solutions can play across the UK.

APSE hopes that, through a combination of CCUS and the pioneering nature-based solutions being conducted at a local level, decision-makers at a local and national level can step up progress towards achieving the target that all UK emissions reach net zero by 2050. Whilst, at the same time, equipping the UK economy with tens of thousands of new, well-paid jobs and world-leading green skills.

All APSE members can sign up to APSE's Climate Change and Renewables Network, which is an online network providing four learning events across the year, with expert speakers from across local government and the wider climate change sector. You can sign up to the network using this link.

Many local authorities are unaware of the extent to which their existing assets have the potential to generate new revenue streams – helping to ease the pressure on budgets and assist in the fight against climate change. APSE Energy can provide a full range of expert consultancy services to member local authorities and public bodies on energy, climate change and green economy related matters. Our experts provide strategic advice, technical feasibility and business case development and project management expertise to support local authority energy projects. We also provide facilitation and stakeholder engagement. For more information on what APSE Energy offers, and the local authorities we have successfully worked with, click here.

James Jefferson, Principal Advisor – APSE Energy

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