ECONOMIC ANALYSIS OF UK CCUS

A report to Carbon Capture and Storage Association

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Executive summary

The UK is in the early stages of developing a CCUS industry, with ambition to deploy four clusters and capture at least 10 million tonnes of CO₂ annually by 2030. We explore the economic impacts of this deployment, review some lessons from the success of the offshore wind industry to highlight policy gaps, and estimate the ongoing funding levels that will be required to roll-out CCUS in the UK.

The benefits of Carbon Capture, Utilisation and Storage (CCUS) to support decarbonisation in the United Kingdom have been recognised for many years, and the Climate Change Committee (CCC) states that CCUS is essential to achieving Net Zero at the lowest cost. With the government supporting the capture of 10 million tonnes of CO₂ per annum (Mtpa) by 2030, the first track of the cluster sequencing progress will select at least two clusters to progress near the end of 2021. It therefore looks likely that the UK will develop a CCUS industry through the 2020s and be amongst the early movers globally at developing large scale decarbonisation-driven CCUS.

We have explored the impacts of rolling out CCUS on the UK economy under two scenarios. The first, the Ten Point Plan scenario, delivers on the UK Government’s ten point plan and Energy White Paper¹ commitment to deliver 10Mtpa of CCUS by 2030, before then scaling up in the 2030s. The second scenario, Net Zero Ambition, models deployment at the level recommended in the CCC’s Sixth Carbon Budget, deploying 22Mtpa by 2030 and then more than tripling capacity through the 2030s.

The support costs required to roll out CCUS in our two scenarios are shown in Exhibit 1.1. Deploying CCUS to 2030 across our two scenarios would require a peak in ongoing support of £1.2 and £2.6 billion per year, although significant uncertainty over required funding levels remains with the key risk

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factors including CCUS and commodity costs and policies around funding and revenue streams for hydrogen and carbon removals. These funding levels could therefore move up or down as these uncertainties are resolved. There is precedent for decarbonisation spending at this level to develop a new industry; the 2020/2021 UK budget for renewable support schemes is set at £8.6 billion\(^2\), with around half of this for offshore wind.

Many of the cost uncertainties should narrow over 2021 through the cluster sequencing process. Continuing CCUS deployment beyond 2030 would require increased funding, although cost reductions should drive a significant reduction in support requirements as the industry develops towards a long-term goal of merchant-driven deployment.

Using Cambridge Econometrics’ E3ME model, we have also explored the economic impacts of CCUS deployment across the UK. In both scenarios, significant economic impacts are seen, with growth in both jobs and GDP. Significantly, these are ‘net jobs’, including supply chain and multiplier effects as well as the loss of jobs from displaced activities and the costs of paying for CCUS support.

Exhibit 1.2 shows up to ten thousand new jobs created under the Net Zero Ambition scenario against a counterfactual where industry continues to emit CO\(_2\). In practise, given the Government’s commitment to net zero and enshrining the sixth carbon budget in law, not deploying CCUS risks forcing highly emitting industries offshore in the early 2030s to meet UK ETS emission limits, with around 50,000 existing jobs at risk through the 2030s from the iron and steel, cement, chemicals and refining industries, as visualised in Exhibit 1.3. The UK is likely to be early mover in the global CCUS space, driven by the UK’s relatively ambitious decarbonisation targets, favourable conditions for CO\(_2\) storage and a relevant skill-base. This creates an opportunity to build a CCUS export industry with the potential to create additional jobs.

Lower levels of ambition, such as the current 10Mtpa target, will deliver similar types of benefits, but with a smaller overall impact. This will include

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\(^1\) Estimated support level required for projects to 2030
lower job creation and protection, and will potentially miss other stated government targets (e.g. on hydrogen production). CCUS development under both scenarios brings significant benefits and establishes infrastructure allowing further CCUS rollout.

We have also reviewed lessons from the success of the offshore wind industry, which ten years ago shared a number of similarities with the CCUS industry of today. We have drawn out five key components of offshore wind’s success, and compared the steps taken to support offshore wind with the steps being taken to support CCUS today. This is summarised in Exhibit 1.4, and while many areas show good progress with CCUS broadly on target, it highlights needs in three policy areas. Two are long-term needs: establishing continual procurement of CCUS over time, and ongoing, consistent supportive messaging around the industry. The third is an immediate need: de-risking CCUS today requires visibility of a long-term funding framework, providing an equivalent to the Levy Framework which provided both funding visibility and consumer protection for renewables a decade ago. Funding within this framework should increase over time to signal continual, rather than stop-start, procurement. Parallels with renewables, and discussions with the industry, suggest this framework should extend to around 2030 to provide sufficient certainty to industrial developments needed now.

Exhibit 1.3 – Interpreting the impacts on employment

CCUS investment delivers jobs directly, but also acts to protect jobs in carbon exposed industries.

Exhibit 1.4 – GAP analysis for CCUS on 5 main components of offshore wind success

UK CCUS needs funding certainty and an ongoing supportive policy environment to flourish.
ÅF and Pöyry have come together as AFRY. We don’t care much about making history.

We care about making future.