ECONOMIC ANALYSIS OF UK CCUS

A report to Carbon Capture and Storage Association

JUNE 2021

cambridge econometrics
clarity from complexity

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CONTACT DETAILS

Bradley Steel
bradley.steel@afry.com
+44 7587 034177

Hector Pollitt
hp@camecon.com
+44 1223 533100

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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 CO_2 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.

CCUS is seen as essential to achieving Net Zero

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 CO_2 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 Paper[1] 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.

Annual CCUS support costs by 2030 are likely to be £1.2b–£2.6b depending on ambition

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

[1] Energy White Paper: Powering out Net Zero Future, Dec 2020.

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.

Exhibit 1.1 – Estimated support level required for projects to 2030

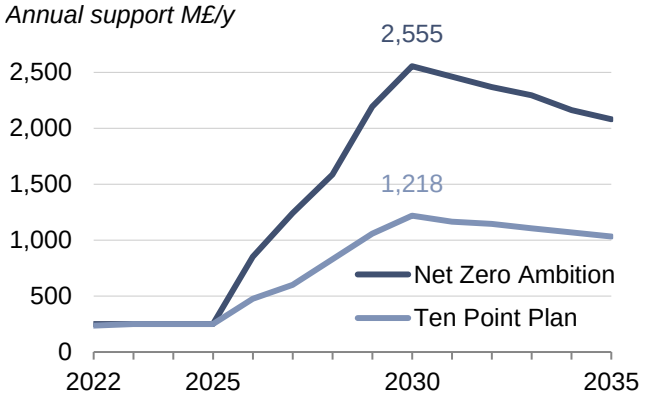
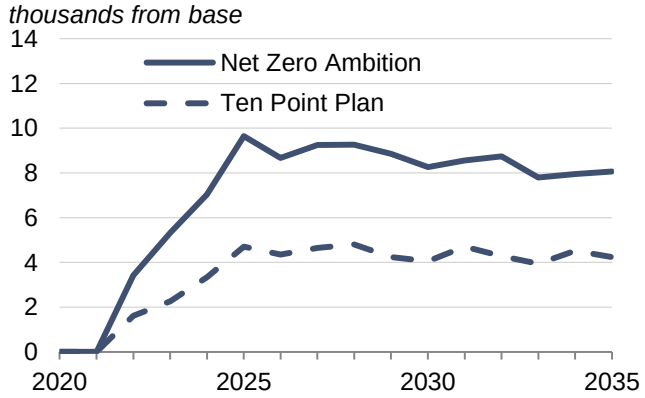


Exhibit 1.2 – Impact on UK jobs



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.

CCUS could create 10k UK jobs by 2025 and help protect 50k more

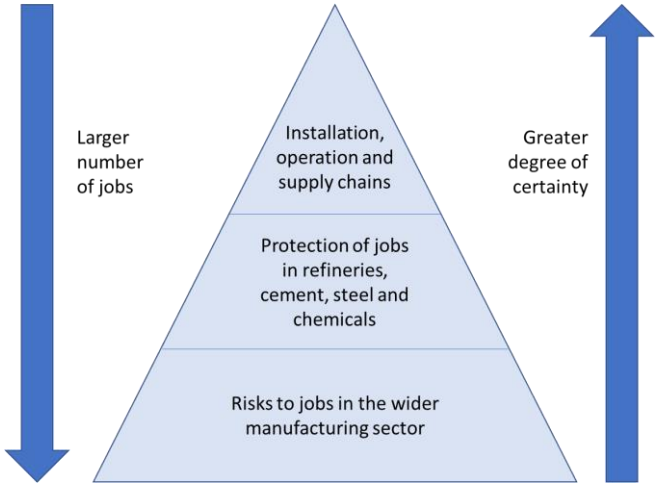
Lower levels of ambition, such as the current 10Mtpa target, will deliver similar types of benefits, but with a smaller overall impact. This will include

[2] Control for low carbon levies, House of Commons Library, 20 December 2017. Quoted in 2016/17 prices.

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.

Exhibit 1.3 – Interpreting the impacts on employment

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



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 1.4 – 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.

	Current status	GAP Analysis
1 **Certainty of funding**	Clear targets are in place Some CIF grant money available for early T&S	**Funding framework needed**
2 **Supportive policy & communications environment**	Currently supportive signalling from Gov. Public awareness low, but 93% supportive or ambivalent	Need ongoing supportive messaging from Gov. Public communication requirements may need further work, but consultations underway
3 **Building the industry**	Early stages: Track 1 in progress, Track 2 announced. Potential in UK, with industrial clusters + O&G experience	Continual procurement needed Optional: Design in local content if want UK to produce & export. Policy required.
4 **Financeable model**	BEIS in process of addressing: 3 business models released, 2 to be released shortly	(Dependent on BEIS release)
5 **Broad industry buy-in**	Industrial Decarbonisation Challenge Phase 2: £171m Gov./£342m Industry. CCUS Cost Challenge Task Force	(Contingent on 1-4)

Status legend On track | In progress | Not on track

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AFRY Management Consulting Limited
King Charles House
Park End Street
OX1 1JD
Oxford
United Kingdom

Tel: +44 1865 722 660
afry.com
E-mail: consulting.energy.uk@afry.com