

CCSA Workforce & Skills Position Paper

Summary – July 2023



The CCSA

The Carbon Capture and Storage Association (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 accelerating the commercial deployment of CCUS in the UK, EU and internationally through advocacy and collaboration to achieve Net Zero emissions by 2050.

Contributors



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This position paper was produced by the CCSA and the views and recommendations in the report are those of the CCSA and are not expressly the views of the contributors to the work.



Executive Summary

This position paper has been produced by the CCSA Skills & Training Task Subgroup, operating under the CCSA Supply Chain Working Group.

Its purpose is to present the CCSA's stance on and understanding of the skills and workforce challenges that are currently facing the Carbon Capture, Utilisation and Storage (CCUS) sector. It offers a high-level overview of the existing skills and training landscape for the CCUS and low carbon hydrogen workforce, encompassing jobs across the entire value chain from capture to transport & storage during the construction and operational phases. This includes an examination of the skills and training obstacles faced by the current workforce, as well as those who are currently in the education system and will constitute the future workforce.

The UK CCUS and Carbon Capture and Storage (CCS) enabled low-carbon hydrogen sector is encountering a scarcity of skilled personnel, particularly in design and engineering construction. This shortage has the potential to significantly impede the timely completion of CCUS projects and have adverse effects on the UK's Net Zero objectives. The competition for skilled labour not only exists within the CCUS sector but also extends to other large-scale infrastructure projects who require the same skilled workforce to deploy across the UK within similar timeframes. The need to replace or re-train an ageing and non-diverse workforce, along with the challenge of attracting a significant number of school and college graduates to an industry that may not be perceived as glamorous, further intensifies the urgency of attracting and training new workers.

According to the CCSA's modelling, the CCUS sector in the UK will generate over 70,000 new jobs and safeguard up to 77,000 jobs in carbon-intensive industries at risk of being relocated abroad. The development of CCUS and low-carbon hydrogen presents opportunities to create and protect employment in regions that have historically experienced economic disadvantages, thereby contributing to the Government's levelling up agenda. This would enhance the UK's prosperity through the production of goods and services necessary for establishing a new industry, as well as the establishment of robust UK CCUS supply chains, which possess significant export potential.

The position paper outlines a series of crucial recommendations that are key to ensuring the availability of resources to facilitate the transition to Net Zero through the implementation of CCUS. The CCSA acknowledges its pivotal role in supporting the sector, as well as specialised stakeholders and groups involved in skills and training development, such as OPITO, ECITB, the Green Jobs Delivery Group, and the Hydrogen Skills Alliance, to name but a few. Collaboration with these entities by the Government and industry is crucial to guarantee the success of their efforts in rapidly cultivating a skilled workforce capable of delivering the first two Track-1 clusters by 2030 and successive clusters thereafter.



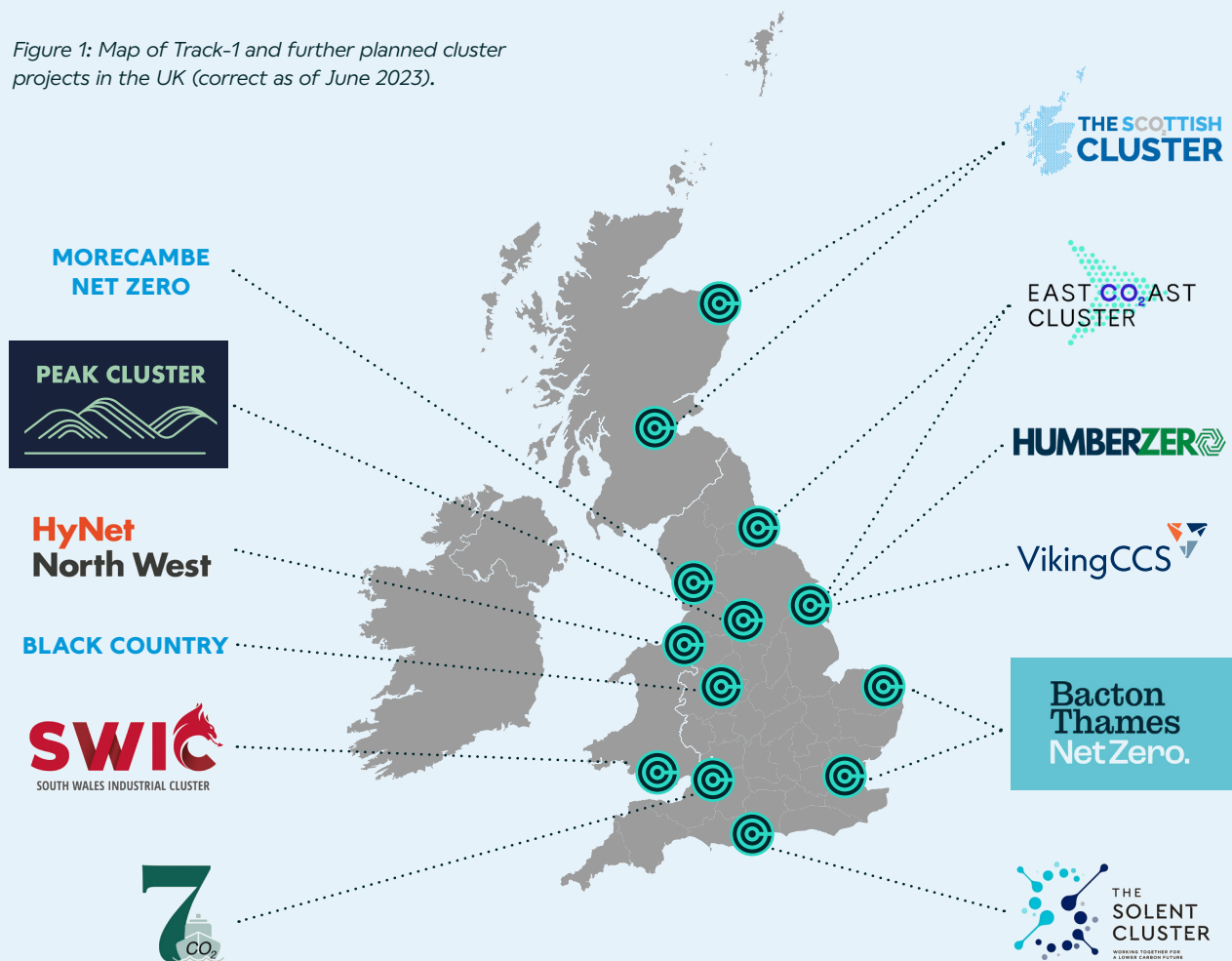
Introduction

The UK Government have developed a CCUS deployment programme to address industrial decarbonisation as part of the Net Zero Strategy¹.

The strategy states the UK Government ambition to capture 20–30 million tonnes of carbon dioxide a year (MtCO₂/yr) by 2030, and an indicative pathway rising to over 50MtCO₂/yr stored by 2035. It includes 2030 targets for CO₂ capture from different sectors, to be achieved by delivery of four CCUS clusters, with at least two operating by the mid-2020s (“Track-1” clusters) and another two by 2030 (“Track-2” clusters). All of which will require a skilled workforce to deploy and operate, without which the transition to Net Zero and the corresponding economic and environmental opportunities and benefits cannot be realised.

HyNet Northwest and the East Coast Cluster have been selected as Track-1 clusters, with the Scottish Cluster selected as Track-1 reserve cluster. Both the Scottish and Viking clusters have been flagged by the Government as suitable for Track-2 selection (at time of publication). Further potential clusters are located at; Morecambe Bay, Peak District/Staffordshire (Peak Cluster), Grangemouth, Bacton, Thames Estuary, Southampton (Solent Cluster), and South Wales (Figure 1). In March 2023, the Government announced that £20 billion would be allocated to the funding and implementation of CCUS projects in the UK, alongside a Powering up Britain; Net Zero Growth Plan² and Energy Security Plan³, which details that the Government has committed to publishing a joint government-industry Net Zero and Nature Workforce Action Plan in the first half of 2024.

Figure 1: Map of Track-1 and further planned cluster projects in the UK (correct as of June 2023).



1. UK Net Zero Strategy: Build Back Greener (2021)

2. Powering Up Britain – The Net Zero Growth Plan (2023) (p.10)

3. Powering Up Britain – Energy Security Plan (2023)



The Government also released a shortlist of eight projects which would proceed to final negotiations to access Track-1 cluster infrastructure and plans were laid out for an expansion of new/previously unsuccessful projects onto Track-1 infrastructure, and for the streamlining of the sequencing process for Track-2. With Track-1 CCUS projects moving forward to construction and operational phases there is an urgent need to understand what the subsequent demands on the UK supply chain and workforce will be, in order to deliver these projects on time.

The development of a UK CCUS and CCS enabled low-carbon hydrogen industry to realise the Government's Net Zero goals, provides a huge domestic opportunity to address the Government's levelling up agenda, by creating jobs in the UK's industrial heartlands which have more recently been disproportionately less well-performing parts of the UK. This would boost the UK's prosperity as a result of the manufactured goods and services required to deliver a new industry, as well as develop strong UK CCUS supply chains with a huge export potential opportunity (the 2019 CCUS EINA study predicts the Engineering Procurement Construction (EPC) sector alone has an exportable value of £2.1bn per annum by 2050)⁴.

However, there are risks of a design and EPC skills bottleneck occurring within the UK skills landscape that must be mitigated if we are to ensure a sufficient supply of adequately skilled workers to deliver CCUS projects on time and capitalise on the ability of the UK to capture the economic opportunity the CCUS industry presents. This is both in terms of maximising local content versus importing of goods and services, as well as exporting UK CCUS services, which will hinge on the sector's global competitiveness and competitiveness of its workforce. Whilst the UK has a strong base of skilled workers in construction and design services across a range of complex infrastructure classes, there are significant concerns among capture project developers regarding a lack of volume of skilled labour for use in CCUS and low carbon hydrogen projects needed to achieve the Government's 2035 CCUS ambitions.

This is not only due to competition between CCUS projects, but also against other large infrastructure projects which will draw on the same skills and competencies occurring over the same timeframes. This is compounded by an urgent need for the engineering construction industry to replace or re-train an ageing and non-diverse workforce in time to meet demand, which will require attracting tens of thousands of new and re-skilled people into extensive training programmes.

Expected CCUS jobs demand

The CCSA undertook modelling to provide national figures on jobs created and jobs protected and estimate that CCUS will create a peak of over 70,000 new jobs, as Opex and Capex is spent in cluster regions and their supply chains⁵. Carbon capture technology will help protect up to 77,000 jobs in carbon-intensive trade-exposed industries, which are at risk of offshoring as carbon prices rise. The largest shares of which are in Yorkshire & Humber (21%), Wales (17%) and the Northwest of England (15%)⁶.

The East Coast Cluster state they are aiming to create and support an average of 25,000 jobs per year between 2023 and 2050. With 21,700 direct and indirect jobs in construction per year and 15,500 direct and indirect jobs in operations per year⁷. The same situation is reflected in the HyNet North West cluster, who estimate the cluster will support 75,000 jobs across the UK by 2035 with 6,000 of these being local permanent jobs in the region⁸.

Whilst these numbers may differ, what they do demonstrate is that the skills challenge facing the CCUS sector is considerable. Yet with concise realisation of the challenges and timely action, the UK can still adequately resource the transition to reach Net Zero.



4. Energy Innovation Needs Assessment: Sub-theme report: Carbon capture, utilisation, and storage (2019)

5. Public First updated the estimates on economic benefits (jobs created; direct, indirect, and induced) and increased GVA as a result of investing in these projects and jobs. These numbers were sense-checked with clusters, individual projects, and DESNZ.

6. Public First analysis of the Business Register and Employment Survey. Energy-intensive trade-exposed industries were defined as including manufacture of refined petroleum, iron and steel, cement, industrial gases, petrochemicals, synthetic rubber, man-made fibres, and glass.

7. East Coast Cluster webpage [accessed 11th May 2023]

8. HyNet North West webpage [accessed 11th May 2023]



Conclusions

The CCUS and CCS enabled low-carbon hydrogen industry is currently heading towards a bottleneck in skilled personnel in the UK workforce, with design and engineering construction being particularly affected. Without preparation now to scale up the CCUS supply chain and skilled workforce at pace, industry faces significant obstacles to the timely completion of CCUS projects, thereby undermining the achievement of the UK's Net Zero objectives. The review of skills and training challenges in this paper has highlighted that challenges for the existing workforce remain around:

- Enabling the movement of the existing workforce from other sectors into CCUS. We need to ensure there are clear pathways for skills transferability from one industry to another with information readily available on which skills are relevant for use in the CCUS sector.
- The type of skills/workers needed for CCUS projects in the development/construction phase are the same as those for other large infrastructure projects developing across the UK on the same timelines. This poses geographical challenges and strains where it is not practical or possible for large volumes of workers to travel to often remote locations at dispersed sites to work on these projects. To address this, a local workforce relevant to the two Track-1 CCUS clusters needs to begin being developed now, by upskilling and re-training the current local community in preparation.
- Retaining teachers in training positions is becoming problematic as many are retiring from the sector or being enticed by higher-paying industry roles, resulting in a lack of qualified trainers.

The recommendations in the table below set out the key actions outlined in this paper. Of topmost priority is the need to develop a coordinating body identified by the Government, tasked with looking across all sectors utilising the same workforce for large infrastructure project development in the UK with the aim of producing a delivery plan for the development of a skilled workforce at scale and pace. This includes proposed funding timelines and plans for training schemes.

In order to develop a strong pipeline of workers to deliver on CCUS projects, decarbonise industry, and deliver on Net Zero goals, we must ensure the upcoming workforce (those currently in the education system), are aware of the career opportunities in the CCUS sector and have access to new broadened training and education pathways.

It is critical that whilst building the workforce at scale and pace we are also championing Ethnicity, Diversity, and Inclusion (EDI) to ensure the workforce composition better reflects society. Overall, there remains a lack of robust EDI data collection across industry which needs to be resolved swiftly to ensure more informed decisions can be made, which will improve representation of under-represented groups in the workplace. Industry and training boards/skills bodies need to take positive, sustained action to reach broader demographics, particularly where geographical distribution of resources may shape the inclusion and diversity of those who can access them. For example, apprenticeships need to be located and offered close to the Track-1 cluster locations which could then support transition into a job role within the CCUS clusters.

Finally, challenges and opportunities for exporting and importing supply chains and skills exist internationally. The import of skills is a very real prospect, as the UK currently does not have the number of domestic skilled workers that will be required to work on planned large infrastructure projects, particularly in the upcoming construction phases of CCS projects. Moreover, many other countries, including historical sources of labour such as Eastern Europe, have similar challenges and aspirations. The UK is internationally recognised for providing excellent training programmes. If well managed, this provides an opportunity to export training services abroad and benefit the UK economy. If we can first incentivise trainers to remain in teaching roles rather than move into industry themselves and build our domestic trainers and skilled workforce to meet UK demand, we can then unlock the export potential of these services further down the line.

The skills challenge facing the CCUS sector is considerable. Yet with concise realisation of the challenges and timely action on the recommendations outlined in this position paper, the UK can still adequately resource the transition to reach Net Zero.



Key Recommendations

Skills Area	Recommendation	Owner	Time scale
Existing workforce skills and training	Government to identify a cross-sector coordinating body (e.g. the Green Jobs delivery group) to produce a delivery plan with funding timelines for skills and training at scale and at pace.	• DESNZ • Green Jobs Delivery Group • Training providers for CCUS • Industry	2023-2024
Existing workforce skills and training	Review existing training availability and effectiveness and develop cross-sectoral mechanisms to promote easy mobility of workers between sectors and build 'local' workforces, particularly in dispersed site locations.	• Industry • Training Providers • Local Authorities (LSIP schemes) • Green Jobs Delivery Group	2023-2024
Future workforce skills and training	Broaden new entry pathways, with clarity on career progression to stimulate greater uptake of careers in the CCUS sector and relevant professions.	• Training/Education providers • Industry • Department for Education	2024-2030
Future workforce skills and training	Simplify the Apprenticeship Levy Fund, with easier access, to ensure increased funded apprenticeship uptake and availability with a view to expand and create a fund for general skills training.	• Government	2023
Equality, diversity and inclusion	Implement targeted recruitment measures and work with third sector organisations with links into under-represented communities to reach more diverse workforce demographics, ensuring jobs and skills transferability opportunities are a central objective for future communication plans for the CCUS industry.	• DESNZ • Industry • Green Jobs Delivery Group	2024-2030
Equality, diversity and inclusion	Increase data collection to measure EDI: • Improved reporting on ethnicity and gender pay gaps • Government to mandate the collection of EDI data.	• Government • Industry	2024 onwards
International supply chain & skills	Build on previous UK capability and capacity mapping to identify CCUS supply chain export economic opportunities, including the export of training services.	• Industry • Trade associations & stakeholders (CCSA, ECITB, OPITO, Hydrogen UK) • Training providers	2024
International supply chain & skills	Develop a global roadmap to demonstrate the strengths and weaknesses of the global CCUS supply chain and skills.	• Trade associations • Industry • UK Export Finance • DIT • DESNZ	2024



