

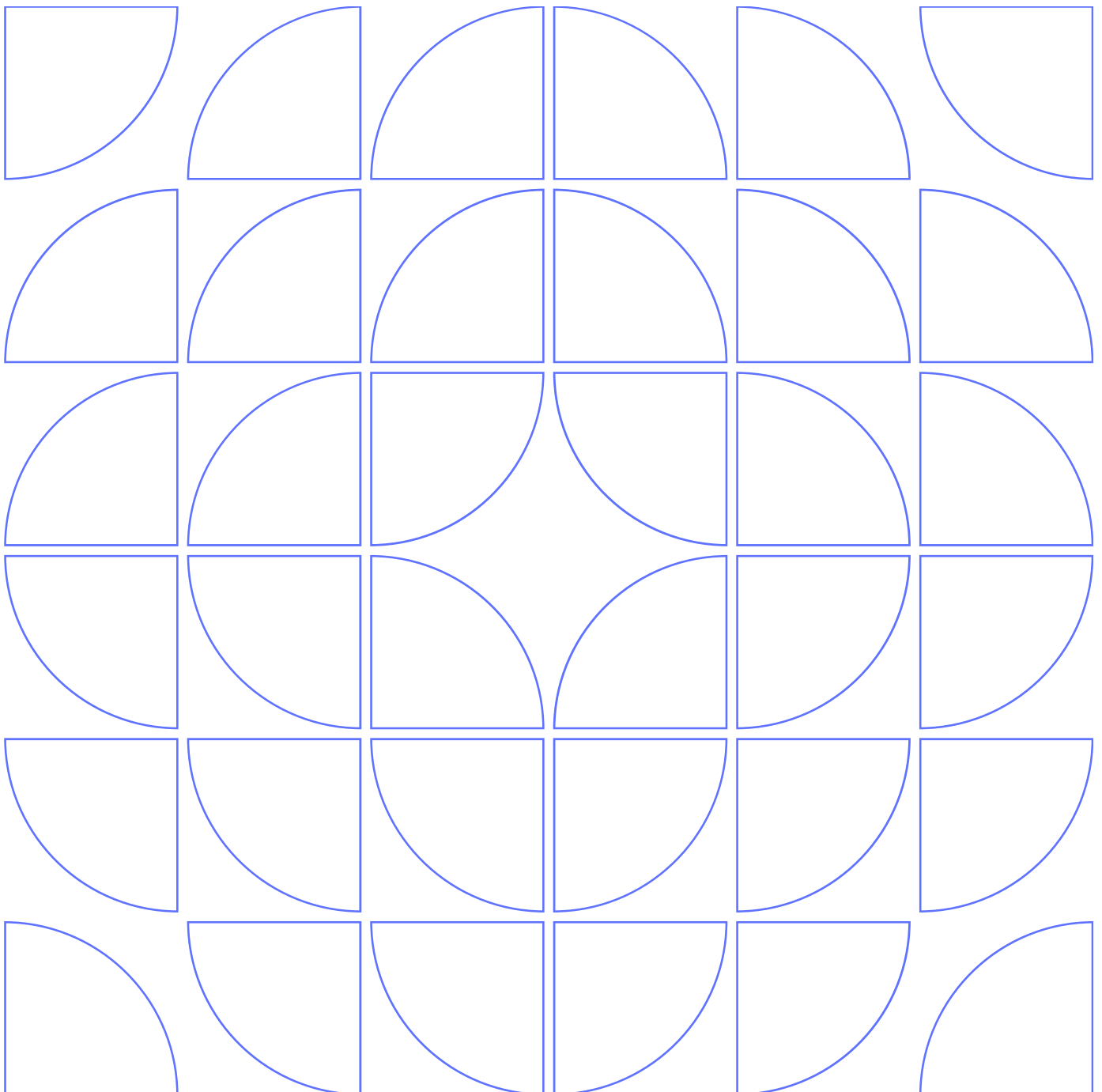


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This report is an output from IDRIC project **IAF 4\_03 Informing understanding and decision-making on jobs and skills in relation to the decarbonisation of UK industry clusters**



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# Policy Brief: Providing certainty and acting with urgency – addressing skills and worker shortages for industrial decarbonisation

## Summary

Decarbonising industrial clusters is a critical component of the UK Government's efforts to transition to net zero by 2050 (2045 in Scotland). In its recently published (December 2023) Carbon Capture Utilisation and Storage (CCUS) Vision, the UK Government argues that establishing a new CCUS industry could add £5BN to the economy by 2050, support 50,000 jobs by 2030 and create storage capacity equivalent to taking 6M cars off the road.<sup>i</sup> Yet achieving these economic as well as environmental gains will require concerted efforts from across Government, industry, educational institutions, and others to address persisting skills and worker shortages.

The Centre for Energy Policy (CEP) has undertaken research funded by the Industrial Decarbonisation Research and Innovation Centre (IDRIC)<sup>ii</sup> which explores the impact of these shortages on industrial decarbonisation efforts, with particular focus on a nascent CO<sub>2</sub> transport and storage (T&S) sector, and how they are playing out in the Track 1 and Track 2 T&S systems. This research follows a mixed methods approach and includes a combination of economy-wide scenario simulations<sup>iii</sup> and targeted workshops with stakeholders across Track 1 and 2 clusters. Our analysis highlights a number of key findings that can inform urgently required policy action, including the development of the UK Government's Net Zero and Nature Workforce Action Plan, which provides certainty to industry and enables the development of the necessary supply chains, avoiding congestion and displacement through effective coordination and resourcing and maximising potential economic gains. These findings include:

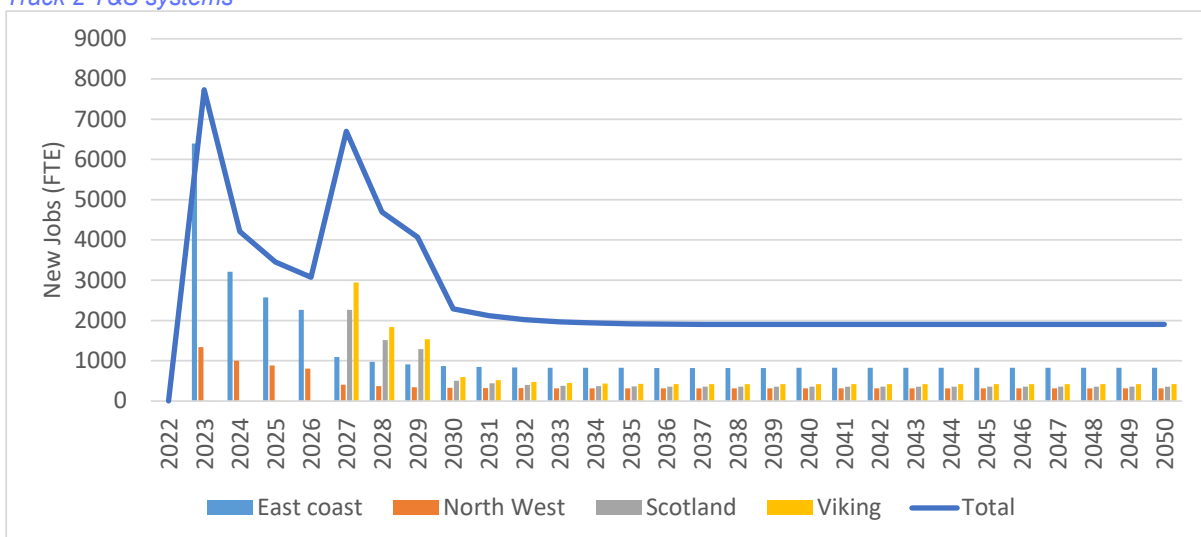
- 1. Understanding peaks in labour demand associated with a nascent CO<sub>2</sub> T&S sector:** Likely transitory peaks in construction sector jobs, particularly during the investment phase of a new CO<sub>2</sub> T&S sector, need to be factored into CCUS deployment. Our research finds that over 7,700 UK full-time equivalent (FTE) construction jobs will be required in the first year of Track 1 T&S systems (Hynet North West and East Coast Cluster) activity, with a second peak of 6,700 FTE jobs as work starts on Track 2 (Acorn and Viking CCS). These peaks need to be considered within the context of wider net zero workforce planning and multiple net zero projects operating simultaneously and hence competing for a limited labour supply.
- 2. Mitigating the risk of job displacement:** Addressing worker and skills shortages can help mitigate the risk of job displacement (which could peak at 4,000) across UK regions and sectors as a result of wage pressures related to increased labour demand for construction and related supply chains in the deployment of the CO<sub>2</sub> T&S sector. They are concentrated in sectors such as retail, services and hospitality, particularly in London and other southern regions where the composition of employment consists of more of these types of jobs.
- 3. Delivering a coordinated approach and sustained investment for a skilled workforce:** Ensuring the skilled and agile workforce required to deliver net zero will require coordination and sustained investment from both Government and industry to both train new workers and retrain/upskill existing workers. These investments, particularly from industry and business at all levels, need to be underpinned by certainty around project timelines and financing.

4. **Innovating and overcoming potential barriers to recruitment:** Attracting new and existing workers to emerging sectors such as a CO<sub>2</sub> T&S sector will require innovative recruitment approaches that include a focus on improving diversity (in terms of gender and ethnicity) and be underpinned by certainty around career paths and long-term employment. Consideration of messaging and in particular the use of the term 'green jobs' and an appreciation of place-based cultural issues which could pose barriers to developing local supply chains also need to be taken into account.
5. **Ensuring consistent approaches to assessing employment requirements:** Existing assessments of employment requirements and economic impacts across clusters vary widely, not allowing for direct and fair comparison between assessments and hindering understanding on the scale of the challenge. This could limit the effective planning and coordination required to inform action on addressing and mitigating labour shortages and other potential negative economic outcomes.

## Understanding peaks in labour demand associated with a nascent CO<sub>2</sub> T&S sector

Our analysis as part of the IDRIC-funded *Labour market and other wider economy challenges in decarbonising the UK's industry clusters (LAB-CLUSTER)* project suggests that there will likely be transitory peaks in construction sector jobs associated with the establishment of a new CO<sub>2</sub> T&S sector, particularly during the investment phase.<sup>iv v</sup> As set in Figure 1 below, our research finds that over 7,700 UK full-time equivalent (FTE) construction jobs will be required in the first year of Track 1 T&S systems (Hynet North West and East Coast Cluster) activity, with a second peak of 6,700 FTE jobs as work starts on Track 2 (Acorn and Viking CCS). This is based on a £3.274M investment between 2023 and 2029 across Track 1 and 2 T&S systems.

Figure 1. Employment impacts on the construction sector of investing and operating CO<sub>2</sub> T&S on the Track 1 and Track 2 T&S systems



It is worth noting that these peaks come from our consideration of 2023 as year 1 (which is also when we develop our analysis), starting with CO<sub>2</sub> T&S deployment for Track 1 clusters and 2027 (year 5), which is when Track 2 starts CO<sub>2</sub> T&S implementation activity, and then completed by 2030. These assumptions relate to the UK Government target to have CCUS

developed in four industry clusters by 2030.<sup>vi</sup> However, we understand that previous timelines associated with CCUS deployment may have now shifted into the future. Despite this, our finding around the likelihood of two peaks in construction labour demand, albeit at slightly later time points, remains valid.

Our research across the net zero space, including on residential heat decarbonisation as well as industrial decarbonisation, points to the increased labour demand from sectors, particularly construction, which will need to be effectively managed.<sup>vii viii ix</sup> This is set in the wider context of a tight labour market and although labour supply constraints are easing in the UK, the number of unfilled vacancies remains 131,000 above pre-COVID levels.<sup>x</sup> Anecdotally, from conversations with those working in the clusters, competition for a finite labour force is already playing out. For example, sectors such as offshore wind and nuclear which are at a more advanced stage of deployment and able to pay premium wages are more able to attract and retain labour.

Importantly, our research also demonstrates that where issues around worker and skills shortages are addressed, the size of the prize that can be derived from introducing a new activity or sector in the economy, such as a CO<sub>2</sub> T&S sector, can be maximised.<sup>xi</sup> It is therefore critical that coordinated action is put in place, through frameworks such as the Green Jobs Delivery Group and the Net Zero and Nature Workforce Action plan, to sequence activity in a way that smooths congestions and eases bottlenecks, as well as incentivise and resource the development of the required skilled workforce.

### Mitigating the risk of job displacement

As well as supporting the creation of new jobs, economic growth and industrial decarbonisation, the establishment of a new CO<sub>2</sub> T&S sector could also displace jobs across UK regions and sectors (potentially peaking at around 4,000 jobs). This is due to wage pressures related to increased labour demand for construction and as Figure 2 demonstrates below, associated with the CO<sub>2</sub> T&S sector deployment activity only (i.e. not considering other activities or changes in the economy).

Figure 2: Regional employment changes (FTE) for Track 1 and Track 2 T&S activity relative to baseline – focus on key activity years: 2023 and 2027, and sectors: construction and CO<sub>2</sub> T&S

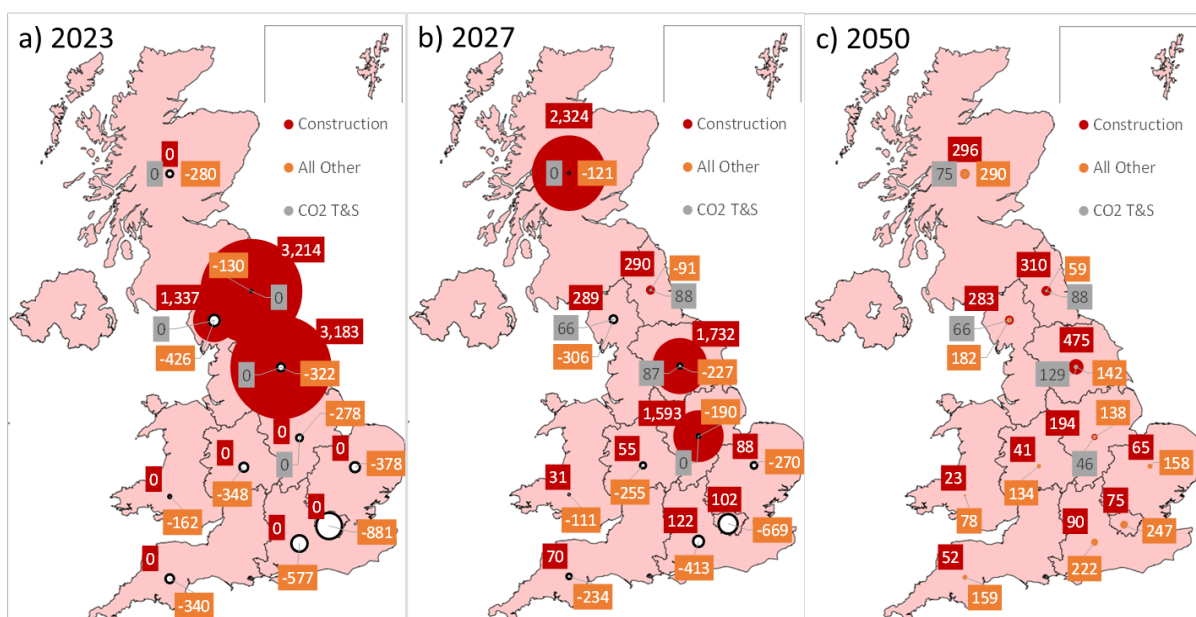


Figure 2 also shows, particularly in the first two frames, that these losses are concentrated in London and other southern regions. This is because job losses mostly happen in labour intensive sectors such as retail, services and hospitality, and the composition of the local economy and related employment in London and the South consists of more of these types of jobs. Although this settles in the long-term (see the right-frame, year 2050, of Figure 2), it is vital that the risks around displacement are considered as part of wider workforce planning, both in terms of how workers in sectors could be reskilled and/or incentivised to relocate, and also, more broadly in relation to just transition and addressing regional inequalities policy agendas.

## Delivering a coordinated approach and sustained investment for a skilled workforce

Deploying CCUS and maximising the economic gains from this will, as previously highlighted, require persistent worker and skills shortages to be addressed in a coordinated fashion, with plans for the sequencing of activity across projects put in place. Sustained, adequate and flexible investment will also be essential. Not least to provide certainty, in the form, for example, of timely financial investment decisions, that will enable industry and business at all levels to have confidence to invest in training the workforce, in the knowledge that projects and a pipeline of jobs are secure.

Conversations with businesses and industry at all levels in the Track 1 and Track 2 clusters highlighted five other areas related to coordination and investment for attention.

1. The need for flexibility, particularly around funding mechanisms such as the apprenticeships levy, and to be able to direct resources to both investing in training a new workforce, as well as reskilling the existing workforce.
2. Considering how best to support and resource on-job training and mentorship which requires business investment, which they may be more reluctant to provide if certainty around project financing and jobs pipeline is not guaranteed.
3. Linked to the previous point, further attention needs to be focused on how those retiring from key sectors and industries can be incentivised to take up roles in further education to train and upskill both the new and existing workforces.
4. What more needs to be done, including the role of new technologies in training provision e.g., virtual reality and welding simulators to ensure further education institutions have adequate resourcing to provide training in line with new sector and industry requirements.
5. Identifying how learning around best practice can be shared across regions and sectors and crucially, enabling better coordination across local, regional and national levels to try and avoid the fragmentation of initiatives and/or duplication of efforts.

## Innovating and overcoming potential barriers to recruitment

Through conversations with the clusters, a number of issues arose that related to the recruitment and retention of a CO<sub>2</sub> T&S sector and broader net zero workforce. The first was around the usefulness of the 'green jobs' label in promoting and categorising jobs. It was suggested that there was a lack of understanding around the term and clarity around what defined a green job. For example, were existing and well-established trades such as welding, considered 'green jobs' and if so, how did that align with perceptions of those already working in those trades. As raised previously, certainty around career paths and long-term employment was also widely discussed, with industry and business at all levels

stating that was essential if they were to invest in training and upskilling programmes. Challenges around recruitment were also cited, and a recognition that early engagement at primary school level was key, as were more innovative approaches to recruitment, for example in relation to the use of social media platforms such as Tik Tok and in increasing diversity. A common discussion within each of the clusters linking to all of these issues emerged around the need for a public information campaign.

Another important issue that was raised within cluster discussion was around the barriers that existed to people taking up new ‘green job’ opportunities linked to place-based cultural issues. For example, in regions that had experienced historical industrial decline, there was a reluctance or cynicism around new ‘green jobs’ opportunities; some of which issues are being explored by other projects funded by IDRIC.<sup>xii</sup> This suggests that these issues need to be taken into account as part of engagement with communities in efforts to develop local supply chains.

## Ensuring consistent approaches to assessing employment requirements

Existing assessments of employment requirements and economic impacts across clusters vary widely. This was a finding highlighted in a recent (2023) report published by UKRI<sup>xiii</sup> and is demonstrated in Table 1 below which we have compiled to highlight the divergence.

*Table 1: Comparison of UK industry cluster plans employment estimates*

IDC Cluster plan	Job creation reported	Methodology	Reference
<b>Humber Industrial Cluster Plan (HICP)</b>	The creation of over 22,000 direct jobs	System model developed by Element Energy and Cambridge Econometrics	HICP, Humber Industrial Cluster Plan: Together it is Possible, 2023, pg. 52.
<b>Net Zero North West (NZNW) Cluster Plan</b>	34,500 jobs	Economic multipliers Developed by MACE group	NZNW, North West Cluster Plan, 2023, pg. 5.
<b>Repowering the Black Country (RtBC)</b>	50-500+ jobs per hub (with 60 hubs expected to be required)	N/A	Repowering the Black Country (RtBC), Exploitation Plan, 2023, pg. 4
<b>Scottish Net Zero Roadmap (SNZR)</b>	Average of 5,000 jobs per year between 2023-2045	Input-output approach (Element Energy)	NECCUS, SNZR - A Net Zero Roadmap for Scottish Industry, 2023, pg. 5.
<b>South Wales Industrial Cluster (SWIC) Cluster Plan</b>	Help retain 113,000 industrial and manufacturing jobs in the region	N/A	SWIC, South Wales Industrial Cluster Plan: A Plan for Clean Growth, 2023, pg. 24
<b>Tees Valley Net Zero (TVNZ) Cluster Plan</b>	Up to 30,000 new jobs by 2040	N/A	TVNZ, TVNZ Key Findings Report, 2023, pg. 4.

The varying approaches pose challenges to drawing for direct and fair comparisons between assessments and could potentially hinder understanding around the scale of the challenge. In turn, this could limit the effective planning and coordination required to inform action on addressing and mitigating labour shortages and other potential negative economic outcomes. Our own research highlights that transparency, consistency and continual evolution of modelling nascent sectors such as CO<sub>2</sub> T&S is absolutely vital.<sup>xiv xv</sup>

## Policy implications

In line with our findings set out above we have identified a number of areas for policy action going forward.

1. **Providing certainty through sustained political and financial commitment:** In efforts to realise the UK Government’s CCUS Vision, and address the challenges posed by persistent worker and skills shortages which will be central to this, the certainty

offered by sustained political and financial commitment will be vital. Both in terms of guaranteeing the pipeline of projects and jobs for the future and/or existing workforce that industry and businesses at all levels are investing in to develop, and ensuring the infrastructure, for example around further education, is adequately resourced.

2. **Improving coordination through the development of national-level plans to address workforce issues:** In developing frameworks such as the Net Zero and Nature Workforce Action Plan and the Scottish Government's Green Industrial Strategy, consideration should be given to how congestion and bottlenecks associated with competition for a limited labour pool to deliver multiple net zero projects can be eased through effective sequencing as well as investment in developing a skilled workforce. Avoiding or mitigating the risk of congestion and targeting sustained investment could also help maximise the economic gains from establishing new sectors such as CCUS and ensure the negative economic and societal impacts of declining industries such as oil and gas are minimised.
3. **Attracting, retaining and developing a skilled workforce:** Transitioning to net zero will require a skilled, flexible and more diverse workforce and consideration needs to be given to how best to attract, retain and develop both new and existing workers. This includes flexibility around funding mechanisms such as the apprenticeship levy, thought into how these jobs are presented, how far the term 'green jobs' is useful, and attention to establishing long-term initiatives to engage with young people from primary school level. This includes consideration of a public information campaign and innovative approaches with, for example, targeted use of appropriate social media platforms to promote career opportunities. Moreover, sharing learning at local, regional, devolved and national levels to support best practice and avoid and fragmentation and duplication of efforts.
4. **Learning the lessons from CCUS in establishing a new sector:** The CO<sub>2</sub> T&S industry is a nascent sector with data around its size, employment requirements, economic impacts and timelines continuously evolving. There are important lessons to be drawn by other emerging sectors such as hydrogen around adopting consistent and transparent approaches to modelling the sector to accurately understand the economic impacts, as well as plan for and facilitate the delivery of projects.

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  - Carbon Capture and Storage Association
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  - Cheshire College South and West
  - Cheshire and Warrington Local Enterprise Partnership
  - ECITB
  - Edwin James Group
  - Harbour Energy
  - HCUK Training
  - Hull College
  - IDRIC



- Ineos
  - National Gas
  - NECCUS
  - Net Zero North West
  - Priestley College
  - Progressive Energy
  - OLG
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  - For further information please contact CEP@strath.ac.uk, The Centre for Energy Policy, School of Government and Public Policy, Humanities and Social Science, McCance Building, 16 Richmond Street, Glasgow, G1 1XQ

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## References

<sup>i</sup> <https://www.gov.uk/government/publications/carbon-capture-usage-and-storage-a-vision-to-establish-a-competitive-market>

<sup>ii</sup> <https://www.strath.ac.uk/humanities/centreforeenergypolicy/ourprojects/idric/>

<sup>iii</sup> We employ a computable general equilibrium (CGE) of the UK economy, a top-down economy wide modelling approach. This allows us to look at changes in employment across the whole economy driven by the development of the nascent CO<sub>2</sub> T&S sector, including direct, indirect and induced employment impacts. However, due to the nature of the information required for this approach there will be differences compared to analysis that uses a bottom-up approach (e.g. cluster economic impact assessments).

<sup>iv</sup> Calvillo, C., Katris, A., Corbett, H., Race, J. and Turner, K. (2024) Regional employment implications of deploying CO<sub>2</sub> transport and storage to decarbonise the UK's industry clusters, Local Economy (under review).

<sup>v</sup> Calvillo, C., Katris, A., Corbett, H., Race, J. and Turner, K. (2024), Understanding jobs demand and displacement outcomes of decarbonising UK industry clusters, Policy brief, 2024 (forthcoming).

<sup>vi</sup> <https://www.gov.uk/government/publications/carbon-capture-usage-and-storage-a-vision-to-establish-a-competitive-market>

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- vii <https://strathprints.strath.ac.uk/86820/>
- viii <https://strathprints.strath.ac.uk/83992/>
- ix <https://strathprints.strath.ac.uk/85736/>
- x <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/bulletins/jobsandvacanciesintheuk/february2024>
- xi <https://strathprints.strath.ac.uk/85736/>
- xii <https://idric.org/project/ia-3-1-delivering-a-place-based-just-transition-in-industrial-clusters/>
- xiii <https://www.ukri.org/publications/enabling-net-zero-a-plan-for-uk-industrial-decarbonisation/>
- xiv <https://strathprints.strath.ac.uk/86711/>
- xv <https://strathprints.strath.ac.uk/87969/>

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