



Policy Brief

Policy trade-offs in delivering and maximising the benefits of CCS: a focus on the economic and labour market challenges

Summary

Transitioning the UK economy to meet net zero emission targets could deliver substantial wider economy benefits. However, it will require significant changes across many sectors and, crucially, in the UK labour market. UK Government publications, such as the [Prime Ministers Ten Point Plan for a Green Industrial Revolution](#), highlight the significant potential to create jobs in new or growing sectors such as offshore wind, nuclear and Carbon Capture and Storage (CCS), with near term opportunities for possibly extended transitory employment gains at infrastructure development stages across the broad and ongoing net zero transition space.

However, the impacts of recent labour shortages bring into sharp focus crucial questions around whether workers, with appropriate skills and expertise, will be available in suitable numbers to service both net zero needs and the economic opportunities the transition offers. Here we consider this challenge in the context of CCS, which is broadly identified as a necessary element of our net zero transition mix, and where the UK Government has already initiated early investment and deployment activity.

Some key insights from the emerging evidence generated by our research at the University of Strathclyde's Centre for Energy Policy are as follows:

- 1. Large scale investment activity in condensed timeframes could have significant displacement effects.** For example, our economic modelling of the wider economy impacts of first investing and then operating a new UK CO₂ Transport and Storage (T&S) industry shows that condensed investment (needed to service the Phase 1 CCS Clusters announced in late 2021) can have very mixed and marked short term impacts on the UK labour market. The condensed investment in the T&S sector shows potential for job creation with transitory net employment gains of 31,500 full time equivalent (FTE) jobs across the UK. Unpicking this, we find that transitory gross job gains are concentrated in the UK construction industry, where we estimate an additional 56,500 FTE workers may be required from the outset. However, the more limited net gain means that employment is displaced in other (particularly more labour intensive) sectors, not just through direct competition for skilled workers, but due to wage pressures triggered across the constrained UK labour market.
- 2. The choice of funding approach plays a key role in driving outcomes.** Our research indicates that the funding approach utilised for different decarbonisation actions will also determine the short and long-term impact on the UK labour market, and on the wider economy. In the CCS example, our results show that under an 'industry pays' approach to deploying carbon capture and/or T&S activity, increased costs to producers could have damaging competitiveness implications that could cause the economy to contract. While the number of jobs created in new (initially supported) industries like T&S may not be directly impacted, the implications of an 'industry pays' funding approach could trigger ripple effects that lead to substantial gross and net job losses across other sectors and the wider economy, with these potentially concentrated in the regions that host our industrial clusters.



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Summary continued

- 3. Even time-limited public support could lead to greater opportunities for ‘green growth’ but this will be limited by labour supply constraints.** Where public funding to guarantee the demand for T&S services involves government running a deficit or socialising the cost via a household pays approach, our results indicate the potential for economy wide expansion, for example, sustaining up to 11,657 FTE jobs and an additional 0.07% of GDP per annum by 2040. However, wage and price responses in a labour supply constrained economy ultimately act to limit the magnitude of expansion across the economy. Thus, issues such as the lack of available workers to meet specific sectoral demands could present a real barrier to delivering deep emissions reduction targets, but also realising opportunities for near and longer term economic gains that could help make outcomes more sustainable and equitable.
- 4. Policy intervention is required to ensure a timely supply of skilled labour to support new projects at both investment and operational stages.** This is crucial in alleviating displacement and wage pressure in the labour market when the economy is growing. It could also be key in transitioning workers where the approach to delivering and funding the transition leads to job losses in some sectors. However, it is important to account for the time required for different initiatives (e.g., training, education, and apprenticeships) to deliver, and to ensure a coordinated approach between government and industry, in consultation with trade unions and training providers to ensure timely labour supply solutions to service both transitory and permanent new labour requirements in decarbonising the UK economy.

1. The Challenge

The transition to interim (2030) and mid-century net zero emissions will drive changes to both the nature and structure of the economy in the UK over the coming decades. This systemic and transformative shift will also interact with other circumstances and global factors, including the current Covid-19 recovery, Brexit, and the geopolitical issues emerging from the conflict in Ukraine. As already witnessed in the context of the current [cost-of-living crisis](#), wider factors such as these can pose major economic challenges. This is particularly the case when set in the context of existing (and exacerbated) economic problems, such as the labour supply constraints faced by all UK sectors. These can trigger challenges and trade-offs around higher labour costs and sustaining real wage incomes, feeding through to and increasing consumer prices and with implications for the nature and extent of economic growth.

As recognised in the UK Government’s [Net Zero Strategy](#), efforts to decarbonise the UK economy will bring new demands and require significant changes in the UK labour market. The Strategy states that of the 6.3million jobs in the UK, about one in five are likely to be affected by the transition to a green economy with workers experiencing either an increase or decrease in the demand for their skills.

The [Prime Minister’s Ten-point plan for a green industrial revolution](#) notes the potential to create and support up to 250,000 green jobs throughout the UK. These job projections reflect recognised opportunities to create jobs in new or growing sectors within the UK economy, feeding an ‘green jobs’ and wider ‘green growth’ narrative that has gained traction in political discourse since Brexit and the Covid-19 pandemic.

However, despite the fact that the transition will involve redeploying many existing workers from current activities – including but not limited to Oil and Gas (O&G) extraction and supply chains, and which is understood to be crucial to deliver a ‘[Just Transition](#)’ - recent challenges around [labour supply and shortages](#) raise real and critical challenges. This is particularly (but not exclusively) important in the context of the near term need for a substantial ramp up in infrastructure development to support new energy supply and other net zero activities.

CEP’s research has examined the challenges and potential transitory and lasting consequences of labour market and funding constraints impacting net zero investment activity across a range of decarbonisation actions, including [enabling residential energy efficiency](#) and the projected [EV roll-out](#). In this policy brief, we focus on the example of rolling out a new UK CO₂ Transport and Storage (T&S) industry needed to the decarbonisation of key industrial clusters. As in our other works, key questions and concerns emerge around:

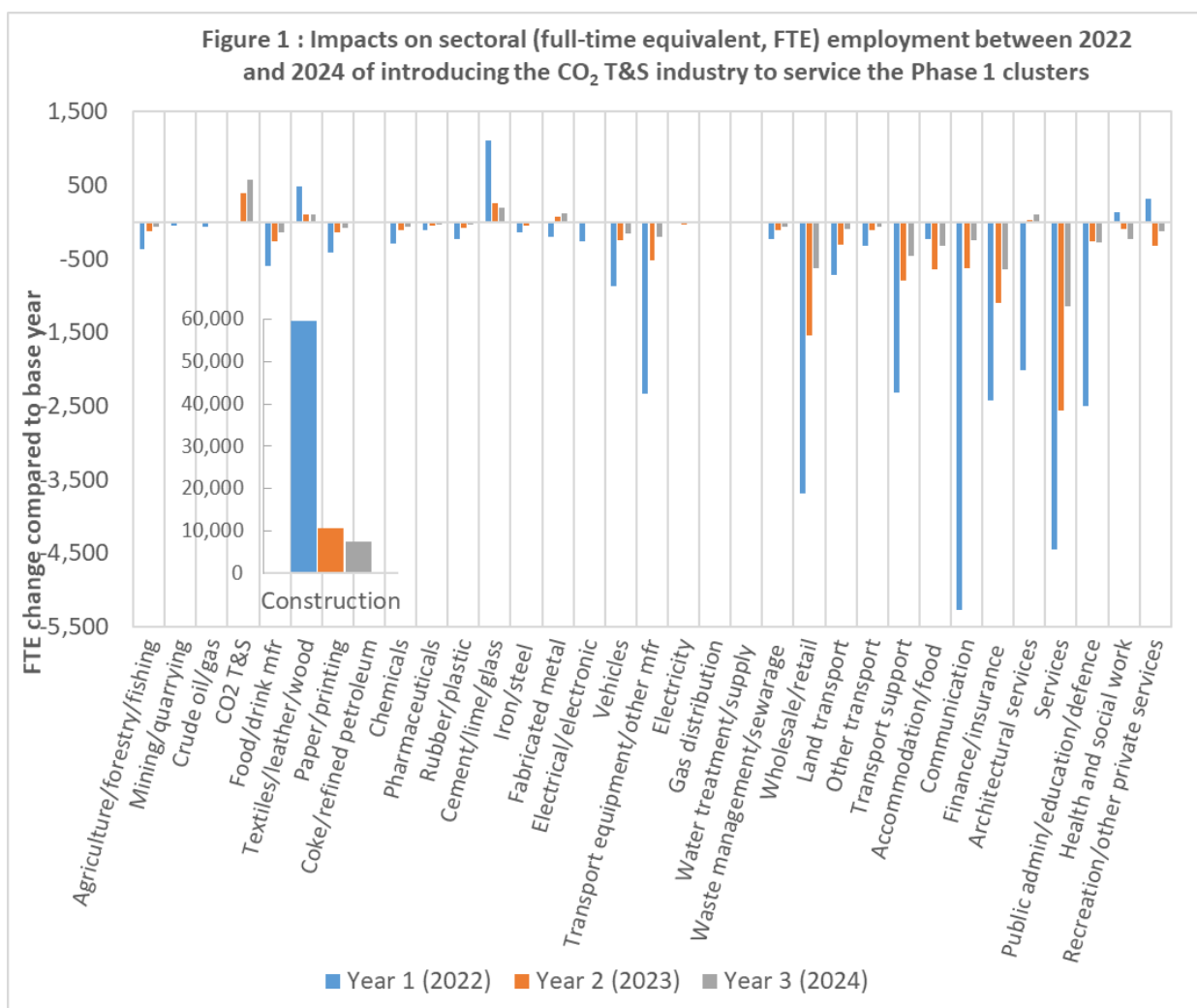
1. How the level and timing of investment of any decarbonisation action/solution such as those associated with CCS deployment will be affected by labour supply constraints challenges.
2. How the labour supply constraints, particularly when interacting with funding constraints and different approaches to ‘who pays’, may affect the economy wide outcomes.

We interrogate these questions by drawing on CEP's [Net Zero Principles Framework](#) (NZPF) in combination with economy-wide scenario simulation modelling to identify and understand the near-term impacts and implications of what we term the 'enabling stage', involving the infrastructure development activities, and the longer-term implications of the subsequent 'realising stage', involving the operational phase and servicing a new industry. We draw on findings reported in a [CEP report](#) published in autumn 2021 and a subsequent [policy brief](#) resetting our near term scenario simulations in the context of the outcomes of Phase 1 of the CCUS [Cluster Sequencing Competition](#).

2. The near-term challenge of labour supply for net zero delivery

Our central finding is that the wider economy and labour market outcomes of investing in and deploying (potentially initially oversized) T&S capacity to support UK CCS depend on both the level and timeframe of the investment spending for the T&S infrastructural development, and the funding model adopted to guarantee the demand for T&S services. Our research considers different 'who pays' cases involving government financing a deficit versus transferring costs to households/taxpayers or to industry via a basic polluter approach. The latter proves most challenging in terms of potential negative wider economy impacts over time. However, in focussing in on the emerging Phase 1 roll out, a key challenge arises regardless of the funding model adopted to sustain the emerging industry. Crucially, the Phase 1 plans imply that relatively substantial upfront investment spending is required in an accelerated deployment timeframe between 2022-2024 (3-year period).

On the one hand, this has the potential to lead to transitory net employment gains of around 31,500 full-time equivalent (FTE) jobs across the UK. On the other, such a level of condensed investment could bring disruptive near-term wider economy impacts in the context of challenging labour supply conditions. In our results, the transitory gross jobs gains are concentrated in the UK construction industry, which we estimate will require an additional 56,500 FTE jobs workers from the outset (in the first year). The gross vs. net contrast for jobs created means that employment is displaced in other (particularly more labour-intensive) sectors (see Figure 1), which, in turn, leads to a mix of (albeit marginal) GDP gains and losses across the three year time period (see Figure 3 below).



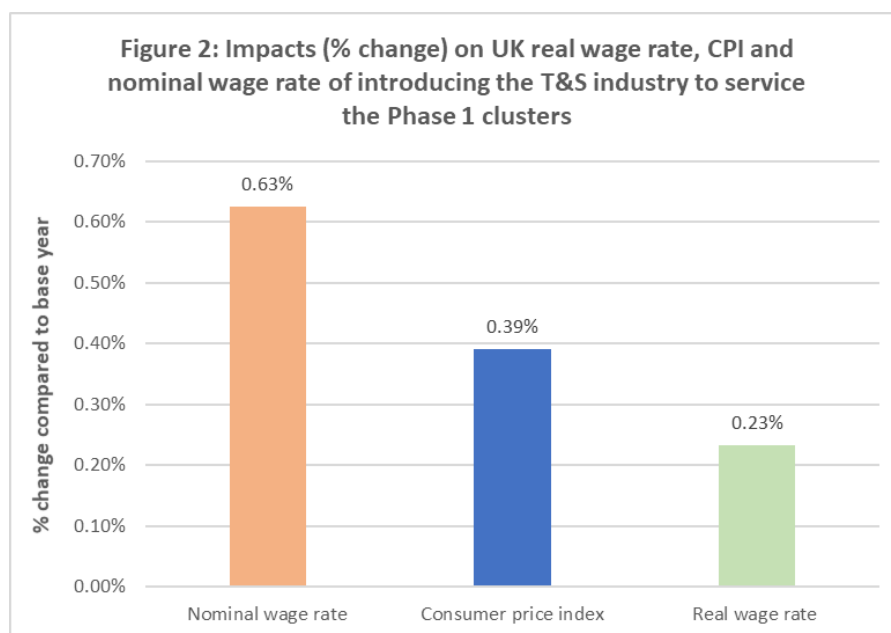


Figure 2 summarises how wage rates faced by all sectors are impacted by the surge in demand for labour linked to the Phase 1 T&S investment where the total UK labour supply is constrained. Crucially, when labour demand increases (and unemployment falls), real wage rates may be expected to rise, and this will equate to increased nominal wages facing producers, and an increase in the consumer price index (CPI), which both erodes real take home wages and exacerbates cost-of-living pressures for all households.

Of course, where enabling the new T&S industry involves repurposing and/or transitioning of existing O&G industry capacity, international labour market transactions could play a role, where workers who are contracted overseas do not directly compete in the local/domestic labour market. Thus, more investigation is required into what the specific labour market outcomes and wider economy implications may be, and what the particular challenges are around global competition for skilled and internationally mobile workers, particularly where oil and gas industries around the world are evolving and transitioning in different ways.

3. Understanding the longer-term impacts of combined labour and funding constraints on wider economy outcomes

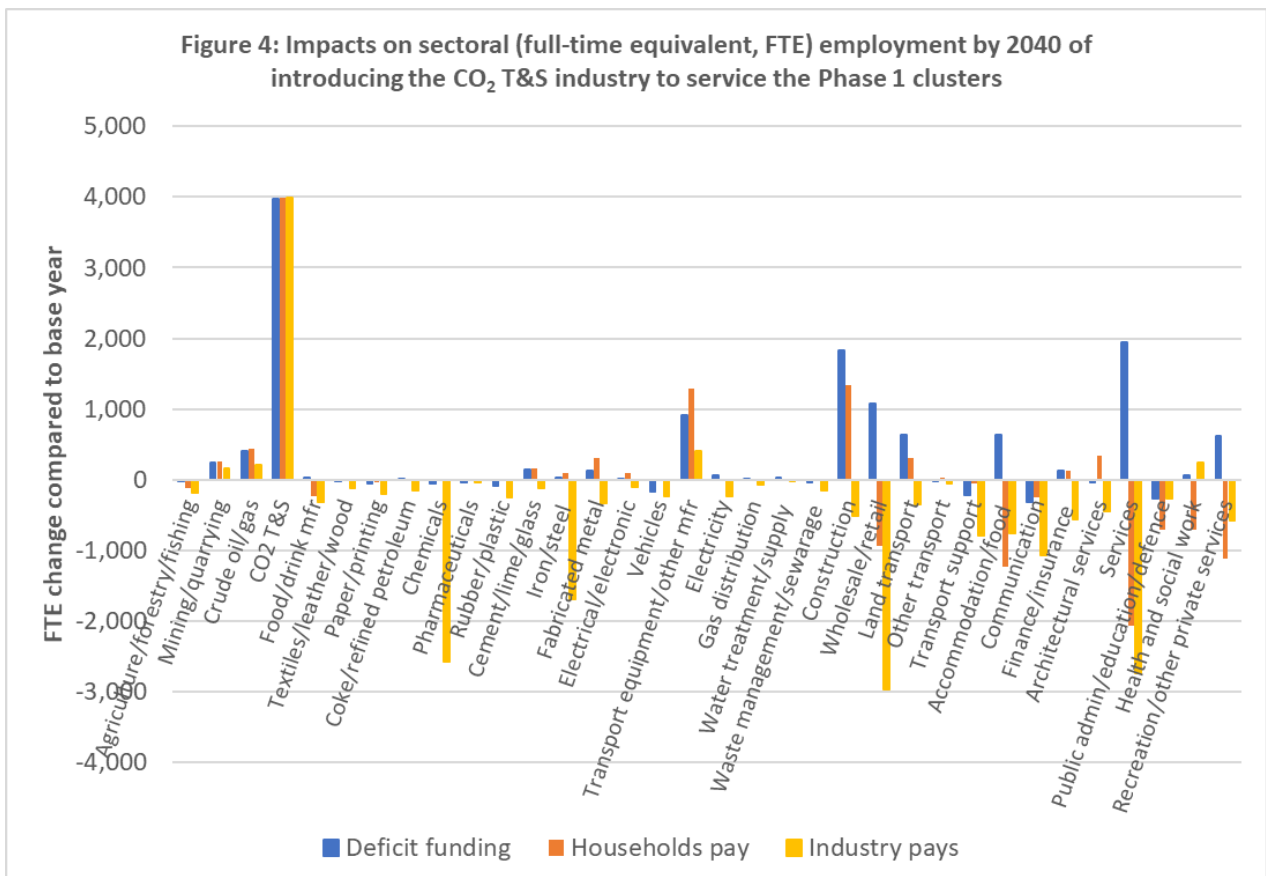
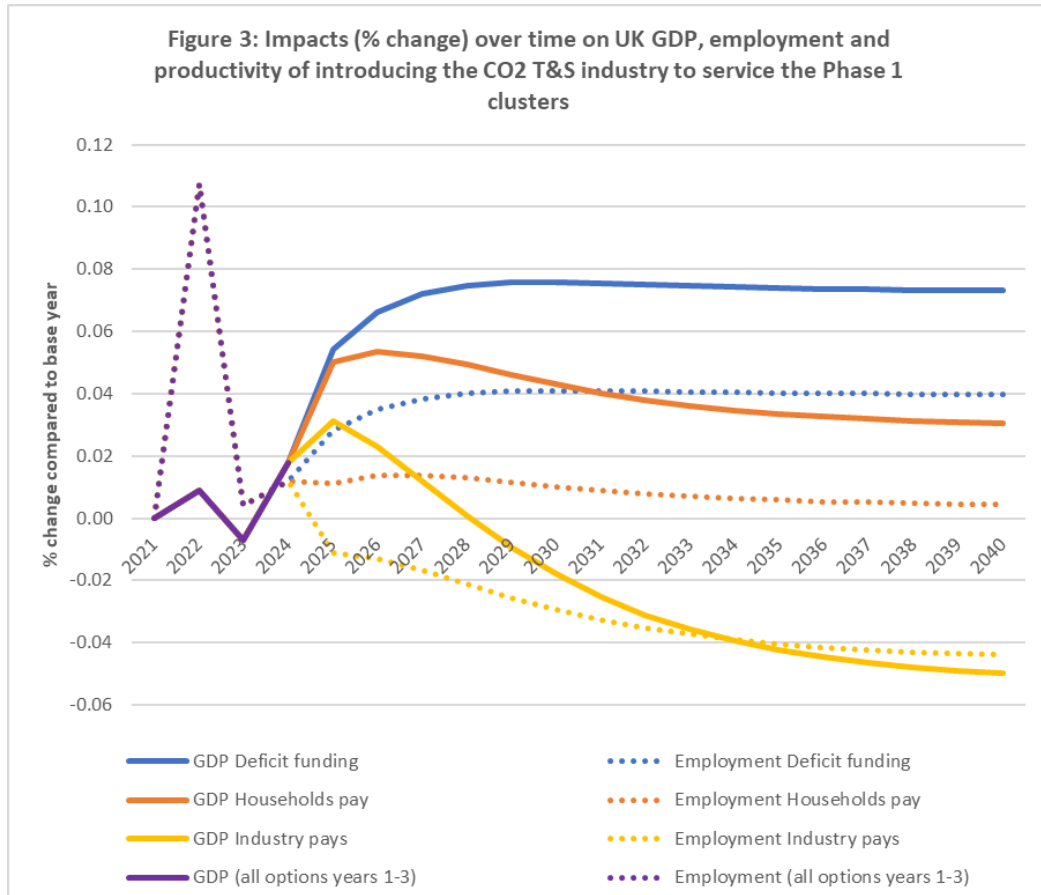
Over time, our research demonstrates that the economic challenge becomes that of the interaction between the labour supply constraint and the funding approach/constraints in guaranteeing the demand of the T&S services over time, and this will add to complex competitiveness-centred challenges around the industrial capture element of CCS.¹

Here, we more fully reset our [earlier scenario simulations](#) around the economy-wide impacts of introducing a new T&S sector to the UK economy in the context of the Phase 1 projects (we have previously published peer reviewed research on the impacts of introducing CCS to the Scottish cluster using the same methodology²).

Generally, our earlier findings are reinforced: where public funding to guarantee the demand for T&S services involves government running a deficit or socialising the cost via a household pays approach, the combined effect of the labour market constraint and the wage bargaining acts to constrain the expansion of the economy.

Essentially, where workers are bargaining wages upward this will constrain any economy wide expansion, which occurs in both our 'deficit funding' and 'household pays' cases (see Figure 3). However, over time this involves less displacement of workers (see Figure 4) than in the initial investment stage (i.e., compared to the picture emerging in Figure 1).

On the other hand, with an industry/polluter pays option - the UK government's preferred funding approach, at least over the medium-term - contractionary pressure emerges where increased costs to producers have damaging competitiveness implications. Here, wage bargaining works to help the economy, by limiting cost pressure in production and limiting job losses as activity contracts. Nonetheless, our 'industry pays' scenario raises critical distributional, regional, and economy wide challenges and issues. Crucially, losses are likely to be concentrated in the regional economies that host the clusters and where worker households spend their disposable incomes.





Conclusions

All of these emerging issues and challenges related particularly but not exclusively to our 'industry pays' scenario for CO₂ T&S pose challenges to the delivery of a 'Just Transition', with the creation of jobs from one activity potentially displacing activity in others. Indeed, the picture could become very complex where creation of new CO₂ T&S industry capacity could, over time, potentially displace activity and jobs in the very sectors that should benefit from the provision of CCS.

Generally, our results suggest that over time tensions could emerge between the UK government's 'green growth' and regional 'Levelling up' agenda. Perhaps the key point is that the introduction of CCS – aimed at delivering deep emissions reduction and a more resilient low carbon economy and industrial landscape over time – should not be expected to automatically deliver the type of wider economy and regional outcomes that also support the regional 'Levelling up' agenda. The latter will require dedicated policy attention more generally and, in the context of deploying solutions like CCS, targeted and timely interventions to help to mitigate increased production costs and prevent offshoring of current industry activity (including jobs and GDP alongside global emissions).

In the context of the UK industrial cluster mission and commitment as well as wider UK net zero agenda, it could be case that the type of near-term disruptive economy wide outcomes associated with condensing the investment spending (here focussing on the example of CCS) might be a 'prize' worth paying. However, policy makers may need to intervene to reduce the pressures on the economy and ensure 'just transition' outcomes for workers and communities. In the context of the labour market challenges and risks we have focussed on here, a crucial policy intervention will involve coordination with industry, trade unions and providers of training to ensure a timely supply of skilled labour to support to both alleviate pressure in the labour market and ensure transition pathways for affected workforces in different sectors and regions.

References

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