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Policy Brief

An early shift to low-carbon fuel production at the Sullom Voe Terminal ('SVT') could provide the backbone for a successful transition of the Shetland economy

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Phase 1 of planned low-carbon fuel ('LCF') production at SVT could alone mitigate the risk to jobs across the Shetland economy from the projected decline in oil processing activity and boost the islands' GDP by at least £2.8 million per annum.

Summary

Could Veri Energy's proposed Phase 1 of low-carbon fuel production mitigate job losses and local GDP leakage associated with the projected decline in oil processing activity at SVT, thereby helping avoid another Grangemouth or Mossmorran? We investigate this question using our Shetland Economy Model ('SEM') to conduct scenario simulations informed by a combination of local authority data and industry projections. In a linked CEP policy brief we present findings showing that, particularly if current regulatory and fiscal headwinds, such as the continuation of the UK Energy Profits Levy ('EPL'), prevent the Clair oilfield extension going ahead, 234 full-time equivalent ('FTE') jobs (80 at SVT and 154 across the local supply chain) would be lost across the Shetland economy by the mid-2030s. Job losses would rise over time to up to 402, and Shetland's gross regional domestic product ('GRDP') would fall by up to £30 million per annum.

Early action on a transition to low-carbon fuel production at SVT would save up to 350 jobs across Shetland in the 2030s and would limit long-term job losses to a maximum of 55.

When we reran our scenario simulations introducing the proposed deployment of Phase 1 LCF production at SVT, we find that there is likely to be a short-term boost to employment across Shetland; a net loss of 34 jobs associated with reduced oil processing activity at SVT becomes a net gain of 269 jobs as deployment of the LCF Phase 1 project begins in 2030. Moreover, 240 of these jobs would be located beyond the terminal's gates, in sectors such as construction, services, ports and harbours, and renewable power feeding LCF Phase 1 production at SVT.

However, whether such gains are possible depends crucially on whether wage costs are driven up in Shetland's very constrained local labour market as the economy expands. On the other hand, by the mid-2030s and beyond, competition in the local labour market will help limit net job losses, which we estimate would be capped at 55 over the long term, and could even be entirely mitigated.

Phase 1 of LCF production at SVT could provide a strong backbone for Shetland's transition, with net local GRDP gains of between £2.8 million and £6 million.

Crucially, the shift to LCF production at SVT makes better use of Shetland's limited labour resources (In addition to reusing existing infrastructure and land, while avoiding redevelopment costs). This is reflected in our finding that the net impact on Shetland's GRDP is positive in all timeframes, i.e., the positive impacts of Phase 1 of LCF production at SVT more than offset the negative impacts of the decline in oil processing activity. A peak in annual GRDP growth of £8-23 million (depending on labour market and other cost/price conditions) would occur in the early 2030s. From 2040, Phase 1 LCF production at SVT could deliver a sustained boost in income generation of between £2.8 million and £6 million per annum.

Early action supporting LCF production at Shetland's Sullom Voe Terminal is an essential step in laying the foundation for the UK's net zero ambitions.

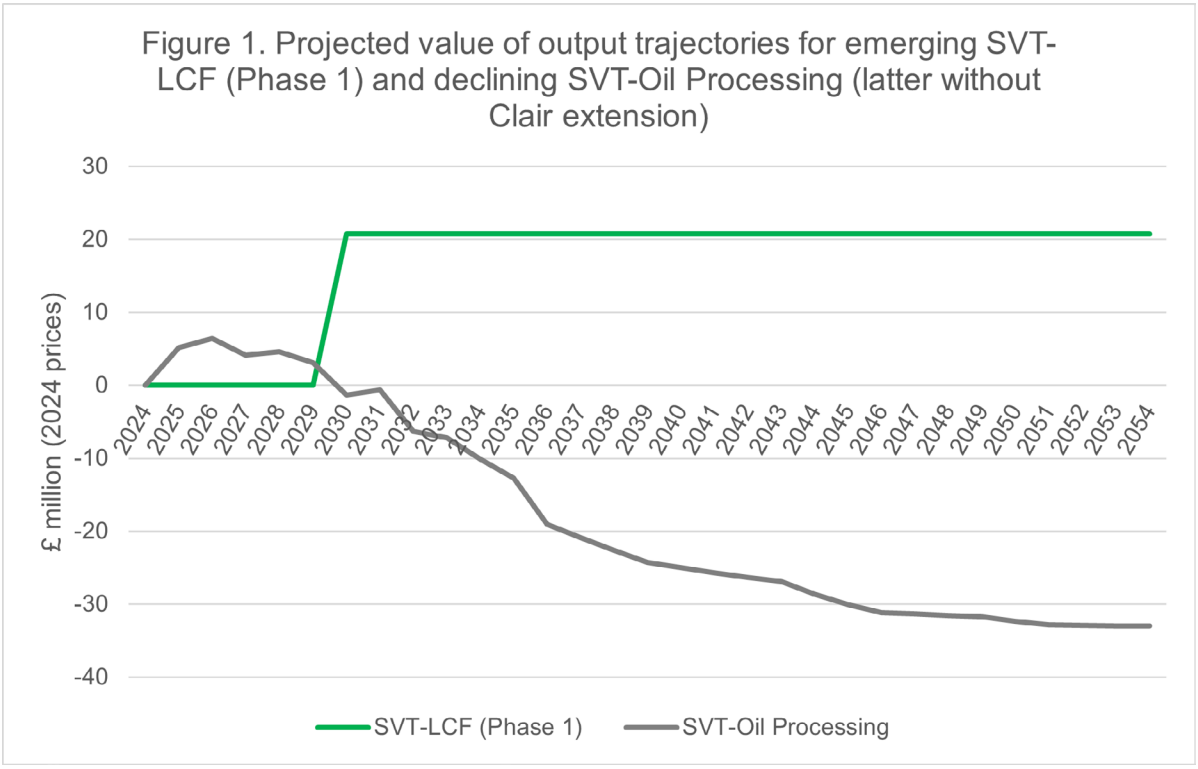
1. The challenge

Through the EPSRC-funded Ocean REFuel project and the UKRI Energy Demand Research Centre (EDRC), the University of Strathclyde's Centre for Energy Policy (CEP) is examining the impacts of the net zero transition on the Shetland economy, beginning with the future role of SVT.

For half a century, SVT has been a nationally significant infrastructure asset. It has been the cornerstone of Shetland's export-oriented energy economy, supporting local employment and supply chains through its role in processing oil extracted from North Sea fields to the east and west of Shetland. The oil processing activity carried out at SVT has made Shetland's ports the third busiest in the whole of the UK in terms of oil and gas traffic.[i] However, as the UK progresses towards net zero and investment in fossil fuel activities is expected to decline, Shetland faces growing uncertainty around long-term economic sustainability and development pathways.

In this context, plans being developed by Veri Energy (a subsidiary of SVT operator and part-owner, EnQuest) offer clear potential for SVT and its local supply chain to transition towards low-carbon fuel production, including e-methanol. These plans aim not only to sustain local jobs and income generation but also to support a broader reorientation of SVT's role, from an export-based oil processing hub to an energy processing hub which uses the islands' available clean energy, resources and skills to produce clean fuels for domestic hard to decarbonise sectors such as fishing and marine transport.

Figure 1. Projected value of output trajectories for emerging SVT-LCF (Phase 1) and declining SVT-Oil Processing (latter without Clair extension)



Source: Produced using Wood Mackenzie projections and LCF Phase 1 scenario data provided to the CEP team.

In this briefing paper, we report on the first stage of an investigation into quantifying and understanding the economy-wide implications of Phase 1 of Veri Energy's plans for LCF production at SVT. This involves producing e-methanol from green hydrogen generated by renewable wind power at the local Neshion Energy Park over the timeframe indicated by the green line in Figure 1. Our research focuses on how this project will impact employment and income generation (GRDP) across the Shetland economy set against the backdrop of the decline in from oil processing activity projected in the dark grey line in Figure 1 (the Wood Mackenzie projections around a 'worst case' resulting from cessation of production from East of Shetland fields where BP's proposed Clair extension does not go ahead).

2. What we did

We used the SEM[ii] to conduct simultaneous dynamic scenario simulations of the planned deployment of Phase 1 of Veri Energy's LCF project and the 'without Clair' projection affecting oil processing activity at SVT using the projected timelines and values in Figure 1. Note that SEM is calibrated on a database that incorporates Shetland's 2017 input-output tables[iii] as the most recently available. We adjust the price base of those data to reflect a 2024 baseline, and to introduce two nascent sectors to the SEM model.

The first represents LCF activity at SVT - labelled SVT-LCF (Phase 1) - which we benchmarked to current oil processing activity at the site (labelled SVT-Oil Processing). Here we have adjusted for the different supply chain requirements (including electricity to be purchased from the Neshion Energy Park) and a shift to more capital/less labour-intensive production detailed by Veri Energy. The scenario simulations involve introducing the projected value of LCF Phase 1 output to be produced at SVT from 2030, which stimulates the required investment to support the direct and local supply chain activity required.

The second represents onshore renewable wind power generation activity at the Neshion Energy Park to meet this new supply chain requirement at SVT, informed by consultation with Shetland Aerogenerators. In the scenario simulations demand for this new sector's output is stimulated by emerging activity in SVT-LCF (Phase 1).

We ran three alternative scenarios to consider the impact of potential responses in Shetland's highly constrained labour market and how changing labour costs may affect outcomes:

1. **Competitive labour market** – any increase/decrease in labour demand drives local labour costs up/down as sectors compete for workers with a fully utilised (and unchanging) Shetland labour supply reallocating across local sectors.
2. **Imperfectly competitive labour market** – the impact of any increase/decrease in labour demand on local labour costs depends on worker bargaining power linked to the local unemployment rate (i.e., assuming there is some excess capacity in the local labour supply).
3. **Flexible labour market** – despite worker shortages, local wage pressure and competition between sectors is limited. This scenario mimics a case where workers will leave the economy when labour demand falls and comes in if it rises, thereby limiting local wage pressure.

3. What we found

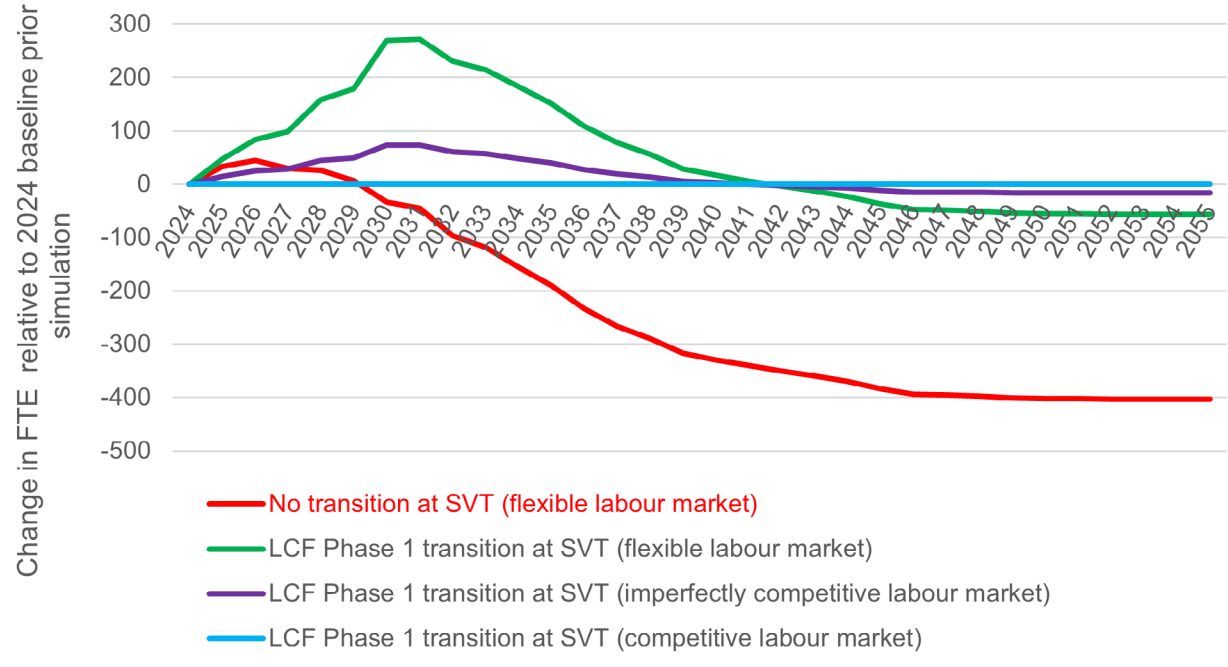
3.1 No transition (the 'do nothing' at SVT case)

Key finding #1 – A worst-case 'do nothing' scenario (with no Clair extension) has such extensive negative impacts for income generation and employment across the Shetland economy that avoiding another Grangemouth or Mossmorran requires urgent action now

The 'do nothing' or 'no transition' at SVT scenario is examined in a linked policy brief, with and without the Clair extension. Here, we revisit our results from the 'without Clair case', presented in the grey trajectory in Figure 1 as the value of the negative demand stock to the existing SVT-Oil Processing sector. This focus is partly motivated by 'without Clair' scenario being the more likely, given the challenging UK regulatory and fiscal policy context. However, it also allows us to focus on the question of whether activity across the Shetland economy, stimulated and supported by deployment of Veri Energy's LCF Phase 1 development, may be sufficient to offset the negative effects of this 'worst case' trajectory for oil processing activity at SVT.

In considering the 'worst case' in terms of the likely labour market response, the flexible labour market case outlined above (and focused on in the first policy brief) is likely most relevant in the face of an economic contraction. That is, rather than potentially accepting lower wages to continue working in existing or other roles in Shetland (thereby helping cushion the blow to the economy), workers are likely to simply leave the islands in search of equivalent employment in a more supportive geography. Local labour market bargaining and competition only come into play where positive forces exist, here through the LCF Phase 1 deployment at SVT (see Sections 3.2-3.3).

Figure 2: Change in total full-time equivalent (FTE) employment across Shetland associated the combined shock of SVT-Oil Processing decline and SVT-LCF Phase 1 deployment (under different labour market conditions)



Source: CEP's simulation using SEM.

To summarise the key results of this analysis (as reflected in the 'no transition at SVT' results shown in red in Figures 2-4 for employment), we find that 80 full-time equivalent (FTE) jobs are likely to be lost at SVT from 2036, compounded by a further 154 job losses across other sectors of the Shetland economy as supply chain requirements and worker incomes decline. By 2050 (assuming SVT continues to operate throughout the projected pathway of decline), we estimate that total job losses at SVT would rise to 144 and a further 258 across the Shetland economy.

This is associated with a decline in total income generation reflected in a steady decline in Shetland's GRDP, which would ultimately fall by £30 million per annum (in 2024 prices), with the trajectory for decline shown in the 'No transition at SVT (flexible labour market) in Figure 5.

3.2 LCF Phase 1 Jobs Transition

Key finding #2 – Early action on a transition to LCF production at SVT would save up to 350 jobs across Shetland in the 2030s and limit long-term job losses to a maximum of 55.

We reran our simulations introducing the transitional scenario of LCF production deploying at SVT with the timeline as illustrated in Figure 1. That is, we simultaneously simulated the decline in activity in the existing SVT-Oil Processing sub-sector and the emergence of the new SVT-LCF (Phase 1) activity so that the results in all the charts reflect net impacts under each of the three labour market assumptions.

The headline finding (reflected in Figure 2) is that, despite LCF production being less labour-intensive than oil processing, the scale of economic activity associated with supporting SVT-LCF Phase1 operations would significantly offset the negative employment impacts of the decline in SVT-Oil Processing. However, the extent to which this is the case depends on the assumptions we make about labour market behaviour and responses.

Flexible labour market case

We begin by taking a closer look at the flexible labour market case that we have focused on for the 'no transition' or 'no change' at SVT case. This is where we assume that local wage-cost impacts are limited because the labour supply is more flexible, with workers entering and leaving the Shetland labour market as labour demand changes. The employment results are shown in the green trajectory in Figure 2 (total employment) and bars in Figures 3-4 (sectoral impacts in the selected years of 2036 and 2050).

The green trajectory in Figure 2 shows that more flexible labour market conditions deliver the most positive total employment outcomes up to the early 2040s. Here, a relatively substantial (for Shetland) net gain in employment peaks at over 250 FTE jobs in the early 2030s (269 in 2030 and 271 in 2031), when activity to support the LCF Phase 1 roll-out is at its peak.

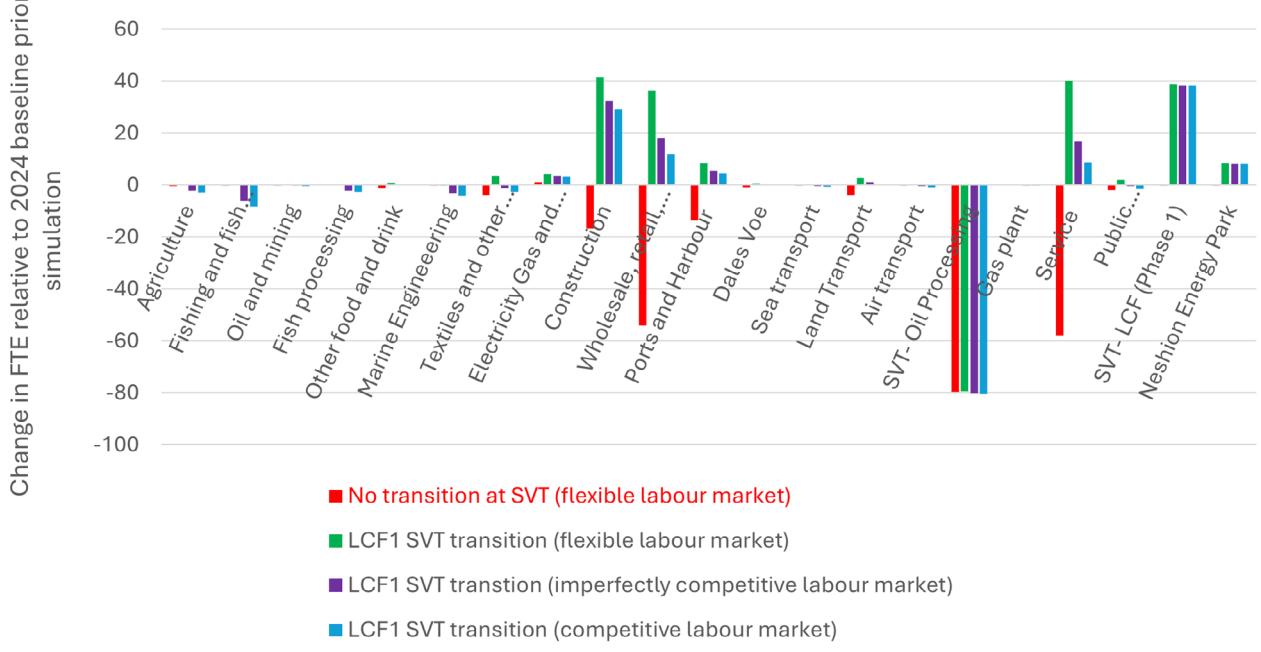
Our findings indicate that the new LCF Phase 1 sub-sector at SVT will initially gain 35 jobs in 2030 (this result is the same in all labour market cases, with SVT-LCF (Phase 1) being the direct target of expansion) set against six jobs lost in SVT-Oil Processing (as the projected decline there begins). Outside of SVT, the additional net job creation most directly related to the SVT-LCF (Phase 1) expansion is concentrated in Shetland's construction sector (+52 FTE in 2030), the Neshion

Energy Park (+6), and ports and harbours (+17). The latter may change over time as SVT's links to the locally publicly owned/operated jetties and other harbour infrastructure evolve, including through the potential to import biogenic CO_2 from industrial emitters elsewhere in the UK to support LCF production.

Two other broad sector groupings are expected to see net increases in employment in 2030 and benefit markedly from increased income generation and spending as the Shetland economy grows: wholesale and retail (+70) and other services (+76).

However, note that under the flexible labour market assumption, we abstract from any local wage cost pressure triggered by such as substantial increases in labour demand, so that there is limited crowding out of employment in other sectors (only a job here or there). Thus, employment impacts are broadly positive across the Shetland economy, with 240 of the net 269 jobs created in 2030 being located beyond the terminal gates.

Figure 3: Sectoral employment change in total full-time equivalent (FTE) associated the combined shock of SVT-Oil Processing decline and SVT-LCF Phase 1 deployment (under different labour market conditions) by 2036



Source: CEP's simulation using SEM.

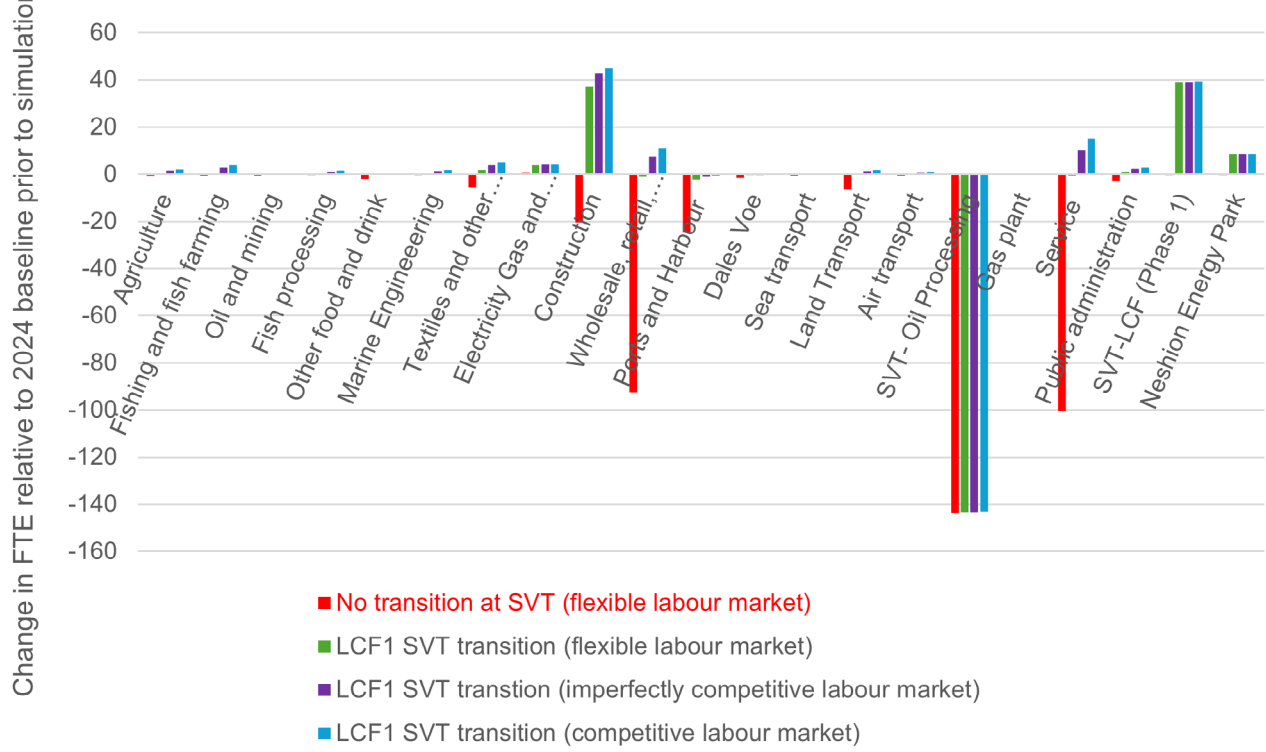
Over time, net gains in employment across the Shetland economy ease off as the decline in SVT-Oil Processing activity gains pace. Moreover, this causes the sectoral distribution of net job gains and losses to shift by 2036 (see Figure 3) relative to the 2030 picture set above.

Nonetheless, the number of jobs saved (and created) by the deployment of SVT-LCF Phase 1 does grow in the medium term, for example, with 234 jobs lost in the 'do nothing' or no transition

case, more than offset to deliver net gains of 109 jobs in 2036. Over time, positive net job creation becomes increasingly concentrated across SVT-LCF (settling at +39 from the mid-2030s), Shetland's construction sector (where net gains slowly erode slightly, ultimately settling at +37 over time) and the Neshion Energy Park (settling at +8 from the mid-2030s).

For all other sectors, reduced activity and employment ultimately translate into job losses as the decline in SVT-Oil Processing activity fully takes hold. The net uplifts are enough to limit total job losses to -55 by 2050, reflecting the negative shift of the green 'flexible' labour market trajectory in Figure 2 from 2043 on, with the distribution of long-term impacts shown in the green bars of Figure 4.

Figure 4: Sectoral employment change in total full-time equivalent (FTE) associated the combined shock of SVT-Oil Processing decline and SVT-LCF Phase 1 deployment (under different labour market conditions) by 2050



Source: CEP's simulation using SEM.

Is this a picture of a 'just' transition?

The distribution of 'losers' and 'winners' across sectors does raise questions about whether this is a picture of a 'just' jobs transition, and the results reported in Figures 3 and 4 demonstrate that question remains across all the labour market closures here. Of course, LCF Phase 1 activity is just that, a first step in the transition of Shetland's energy sector and economy, where freeing up of labour capacity across all sectors could itself be regarded as an important transitional step, particularly given the challenging nature of the remote region labour market constraints.

Moreover, as discussed in Section 3.3 below, the shift to LCF production makes better use of Shetland's limited labour market resources, certainly at the terminal itself, and the net impact on

Shetland's GDRP in Figure 5 is positive in all timeframes. That is, even under the flexible labour market assumption, where there are negative total jobs impacts in the long term, the positive income generation impacts of Phase 1 of LCF production at SVT more than offset the negative impact of the decline in oil processing activity.

Impacts of varying the labour market assumptions

However, it is worth considering other labour market assumptions. While the flexible labour market case gives us the maximum job gains in the short- to -medium term, it also maximises job losses when the SVT-Oil Processing decline is at its deepest. The other two labour market cases considered here help us understand how the picture may change if more competitive forces come into play in Shetland's highly constrained labour market.

First, consider what we have labelled the imperfectly competitive labour market, where we assume that the total labour supply is constrained, but there is some excess capacity with at least some transitory unemployment as the economy adjusts (from a starting point where Shetland does record relatively low unemployment). Here, we also assume that workers will consider the real wage rates on offer and have some bargaining power to raise them when labour market conditions are tight, but will also accept lower real wages when unemployment is rising. The main consequence is that any expansion will be constrained by upward cost-price pressure, while any contraction will be 'cushioned' by the opposite effect.

This is reflected in how the total employment trajectory shifts in moving from the green 'flexible labour market' to the purple 'imperfectly competitive' labour market trajectory in Figure 2. Underlying this is a larger spike in wage costs, which reflects greater upward pressure on the local consumer price index (CPI) in the latter case. The outcome, as reflected for 2036 in Figure 4, is smaller net job gains in sectors other than SVT-LCF and the Neshion Energy Park, and slightly more 'crowding out' in net job loss sectors.

On the other hand, over time, as the contractionary pressure from the decline in oil processing activity at SVT declines, the relaxation of labour cost pressures has the opposite effect, with slightly more employment growth in the purple 'imperfectly competitive labour market' bars compared to the green 'flexible labour market' ones. This ultimately reduces long-term net job losses from 55 to 16 as we move from the green to purple total employment trendline in Figure 2.

If we take the extreme labour market assumption of no net job creation or loss overall in the fully 'competitive labour market' case (blue trend lines and bars in Figures 2-5), where a fixed Shetland labour supply simply reallocates across sectors, there is more cost-price pressure and more cushioning of positive and negative impacts. Thus, total employment flatlines in Figure 2, and there is slightly more displacement across sectors in all timeframes, with Figures 3 and 4 taking 2036 and 2050 as key milestone years.

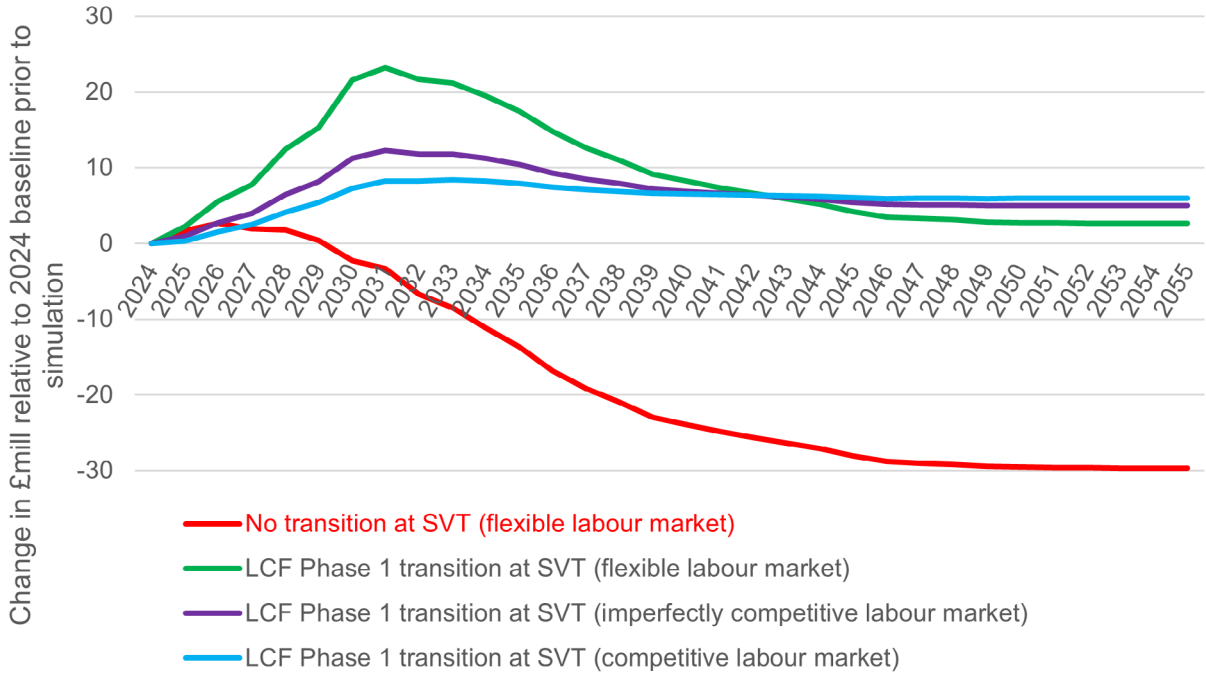
The actual employment outcomes (overall and across sectors of the Shetland economy) will lie somewhere between the extremes of the flexible and fully competitive (and fully constrained) cases discussed here. However, we can draw broad conclusions in that (a) throughout the 2030s jobs 'saved' (the difference between the no transition at SVT and LCF Phase 1 transition cases) range from a minimum of the 34 that would otherwise be lost under fully competitive case in 2030 to a maximum of around 270 in 2030-31 in the 'flexible labour market' case.

3.3 LCF Phase 1 Income Generation Transition

Key finding #3 - Phase 1 of LCF production at SVT can be expected to deliver sustained net gains in income generation across the Shetland economy of between £3 million and £6 million per annum, with peaks of up to £23 million (in 2031) if wage cost and price pressures are limited.

As highlighted above, however, a central result of our analysis is that the net impact of the Phase 1 LCF deployment at SVT is sufficient to more than offset the negative impacts of the decline in oil processing activity at the terminal across all timeframes. Moreover, Figure 5 shows that this finding is qualitatively robust across all alternative labour market closures, which capture the extremes of how Shetland labour market conditions may play out. This finding is driven by the fact that the shift to LCF production at SVT makes better use of the terminal's and Shetland's limited labour resources, including through the shift in local supply chain activity with LCF production relying on capital-intensive power input from the Neshion Energy Park.

Figure 5: Change in Shetland GRDP across Shetland associated the combined shock of SVT-Oil Processing decline and SVT-LCF Phase 1 deployment (under different labour market conditions)



Source: CEP's simulation using SEM.

The specific figures underlying Figure 5 tell us that the maximum likely peak in the net positive impact on Shetland's GRDP occurs in 2031 with a boost of £23.25 million (in 2024 prices) under the 'flexible labour market' assumption (green trendline). The peak would be minimised if the labour market were fully competitive and constrained, at £8.26 million in 2031, though in that case the peak would come later, in 2033, with an £8.45 million boost. Under our 'imperfectly competitive labour market', a slightly higher peak of £12.32 million is achieved in 2031.

However, as reflected in the job results above, less flexible labour market conditions deliver a steadier, more sustained boost to Shetland's GRDP. Figure 5 shows how the GRDP trajectories converge on a sustained net-positive long-term outcome, with the minimum positive long-term per annum impact by 2050 of just under £2.8 million under the 'flexible labour market' case and almost £6 million under the fully competitive/constrained one. Again, the 'imperfectly competitive' labour market case projects a more positive constrained outcome, with a long-term boost of £5 million per annum.

Thus, we can conclude that Phase 1 LCF production at SVT could, on its own, deliver a sustained boost in income generation across all time frames sufficient to offset losses associated with the decline in oil processing activity.

4. Conclusion

This briefing paper has presented the headline findings from our analysis of the potential economic impacts of introducing LCF production at Shetland's SVT in the context of a 'worst case' for the projected decline in oil processing activity, as extraction in the East and West of Shetland oil fields without BP's proposed Clair extension.

The headline finding emerging is that an early shift to low-carbon fuel production SVT through Veri's Phase 1 LCF plans could provide the backbone for a successful transition of the Shetland economy. Our results show that this one development could be sufficient to largely, if not entirely, mitigate the total job losses across the Shetland economy and has strong potential to deliver net positive impacts on Shetland's overall economic performance and the GRDP that it generates.

Of course, there are clearly questions to ponder around the distributional impacts of the transition that we analyse here. However, it is important to note that what we have considered here is just one of a number of new energy developments being proposed, not just as SVT (where a Phase 2 of LCF production and carbon storage activity is also planned). Here, local supply chain capacity freed up by the decline in oil processing activity will constitute an essential resource if the Shetland economy is to transition to a sustainable and prosperous future.

Thus, the key message is that early action supporting Phase 1 LCF production at SVT is an essential step in laying foundations for a successful energy transition if another Grangemouth or Mossmorran is to be avoided in transitioning the Scottish and UK economies to a net zero future.

CONTACT

The quality and usefulness of our research depend on the input of local stakeholders and experts. Please reach out to the CEP research team (cep@strath.ac.uk), led by Professor Karen Turner (karen.turner@strath.ac.uk), if you have any inputs, thoughts or suggestions.

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End-notes and references to underlying research

i See p. 24 of 'Shetland in Statistics 2024' at https://www.shetland.gov.uk/downloads/file/10684/no-44-shetland-in-statistics-2024.

ii The Shetland Economy Model is currently undergoing initial peer review. It is a regional CGE model sharing key properties with the Scottish AMOSENVI model (e.g., see the peer reviewed paper by Figus et al., 2019 published in Regional Studies at https://doi.org/10.1080/00343404.2018.149001). In introducing nascent activities like LCF production and linked onshore power generation at the Neshion Energy Park we follow the approach developed for introducing new sectors in a regional context established in the peer reviewed works of Turner et al., (2023), published in Local Economy at https://doi.org/10.1177/02690942231203932, and Turner et al., (2024), published in the Journal of Cleaner Production at https://doi.org/10.1016/j.jclepro.2023.140084.

iii The Shetland 2017 IO tables were constructed by the Fraser of Allander Institute at the University of Strathclyde: all documents and data are available for download at https://fraserofallander.org/publications/shetland-economic-accounts-2017/.