



Project Brief

Maximising the benefits for Shetland's economy and long-term sustainability of transitioning to green hydrogen production using renewable wind power

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Overview

The Centre for Energy Policy (CEP) based at the University of Strathclyde has launched a new project using our expertise in economy-wide impact studies to investigate how Shetland could maximise benefits and encourage investment in energy transition activity. Specifically, this project is exploring how potential green hydrogen production enabled by harnessing Shetland's extensive wind power resources may impact the prosperity and sustainability of the local economy and affect the lives and livelihoods of its residents. In doing this, it will explore how Shetland's extensive renewable wind power, supply chain and infrastructure capacities, particularly those developed through hosting oil and gas industry activity, could contribute to the island's transition to a prosperous and low-carbon future.

One of CEP's overarching aims is to develop our research in ways that facilitate collaboration and engagement with central stakeholders including the Shetland Islands Council, industry developers, the Scottish Government and others to develop a longer-term initiative investigating and communicating how the net zero transition may affect Shetland's prosperity. Crucially, we anticipate the emergence of key lessons for Scotland, the UK and other island nations.

Work so far

This project is part of a wider £10M [Ocean-REFuel project](#) led by the University of Strathclyde and investigating the potential of harnessing offshore wind and marine renewable energy to produce zero carbon hydrogen and ammonia fuels.

In the first stage of our project, we have been working with the Shetland Islands Council to investigate the number of jobs and gross value added (GVA, or GDP) currently supported by oil and gas industry activity. This draws on previous work by the Fraser of Allander Institute to develop [economy-wide input-output \(IO\) accounts for Shetland](#). Here, we have focused initial attention on the Sullom Voe Terminal (SVT), where warehousing of oil extracted offshore is concentrated.

Examination of the Shetland IO accounts shows that in recent years around 170 full-time equivalent (FTE) workers have been employed at SVT. However, a simple 'multiplier' analysis highlights that, through upstream supply chain linkages within the Shetland economy, and how workers spend their wages, activity at SVT has supported around a further 320 jobs (making 490 in total, suggesting an employment multiplier of about 3). These indirect and induced jobs are spread across a wide range of sectors, from ports, harbours and transport (around 46 FTE jobs), through wholesale, retail and catering activities (114 FTE jobs), to communications, finance and other services sectors (around 80 FTE jobs, depending on what we include under services).

Moving the project to its next stage

The aim going forward is to understand whether the emergence of hydrogen production activity at SVT - potentially with international exports to countries like Germany running through the nearby harbour - would support and sustain such strong embedded supply chains and associated level and extensive distribution of jobs across the Shetland economy. This will involve talking to industry and policy stakeholders to explore questions such as how, and over what timeframes, the upstream supply chain of SVT may change to support hydrogen production, and where hydrogen produced will go. For example, all the oil currently going through the terminal is exported to the international marketplace (even if some comes back to Shetland and the wider Scottish economy). However, international markets for hydrogen are still maturing and the transportation requirements (and costs) will be different to oil (and may involve converting to methanol), while there could be some important uses of hydrogen within Shetland (e.g., in decarbonising land transport). The outputs that will be produced, in the form of initial economic impact studies and linked policy briefs, will constitute new evidence on how an economy like Shetland - and the people and businesses therein - may be affected by things like the repurposing



of key infrastructure (like SVT) to deliver the energy transition. This is likely to be crucial intelligence for policymakers making decisions based on the wider social value of public investment and, crucially, the private investment this should leverage - both public and private. However, moving forward through the project, it is important to build out to more sophisticated analysis that introduces consideration of the potential time path of costs and benefits, and how this affects the distribution of impacts across different sectors of Shetland's economy and the people whose livelihoods depend on the jobs and other forms of income generation affected by the transition.

Developing longer-term dynamic economy wide-impact analysis

The initial economic multiplier work will serve as a useful basis and framing for the longer-term research that we plan to undertake focusing on how electricity generated at the offshore NE1 sites (selected as part of the Scottish Government's Scotwind clearing process in 2022) could be used in green hydrogen production. However, the NE1 sites are not due to be built until the early 2030s and thus green hydrogen production will not be possible until later in that decade. While a clearer picture emerges there, our work will initially focus on how Shetland's onshore wind capacity – including the new Viking windfarm that is due to come online this year – could help establish links to new hydrogen production at SVT and other potential facilities and, thereby, help transition existing and create new supply chain linkages and jobs. To do this, we need to work with a wide range of government and industry partners to understand the following:

Current and future activity at SVT e.g.:

- How different will hydrogen production action be compared to current oil warehousing at the SVT site?
- What are the current and future supply chain requirements, and where will the hydrogen produced go and be used?

Current activity and future changes regarding Shetland's electricity sector e.g.:

- What factors will dictate the eventual routes to market of NE1 electricity?
- How much electricity will be available to produce green hydrogen in Shetland in 2025, 2030, 2035 etc.?
- What will the supply chain requirements be?

Engaging in discussions around these questions will help us both to build scenarios based on the latest data that can underpin our economic modelling and identify (drawn from the resulting analyses) economically, socially and politically feasible pathways through which positive economic and environmental outcomes can be secured for the Shetland Islands and its communities in this transition. This will constitute crucial intelligence for policymakers charged with making decisions at Shetland, Scottish and UK levels. CEP has undertaken similar (peer-reviewed) work to model similar nascent sectors that we can draw from in designing and conducting this project. One example includes modelling a CO₂ Transport and Storage sector in the UK looking at the four Track 1 and Track 2 industry clusters and understanding the wider economic outcomes regarding jobs and GDP of this deployment for both the Scottish and UK economies. This work has been undertaken as part of the [Scotland's Net Zero Infrastructure programme](#) (collaborating with partners including Storegga, Shell, SSE and National Grid) and research funded by the Industrial Decarbonisation Research and Innovation Centre (IDRIC).

Planned engagement

We have several initial engagement activities already planned, including:

- Initial stakeholder workshop in early 2024 (March) with associated 121 engagements to collect relevant data and insights to inform initial work around SVT.
- Further stakeholder workshop (May) to discuss emerging findings and consider how next steps of the work could be best taken forward.
- Published brief to be shared with key stakeholders (June).
- Future research agenda developed in consultation with stakeholders (July).

Further information and contact

The project is being led by Professor Karen Turner, the CEP Director. For further information about the project please contact Hannah Corbett, Senior Knowledge Exchange Fellow, CEP, hannah.corbett@strath.ac.uk.

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