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Publicly Owned Energy Company

SCCS evidence to the Economy, Jobs and Fair Work Committee

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1 Introduction

This paper sets out SCCS's evidence to the Scottish Parliament Economy, Jobs and Fair Work Committee's inquiry into a Scottish publicly owned energy company. Full details of the inquiry can be found here: http://www.parliament.scot/parliamentarybusiness/CurrentCommittees/109094.aspx.

2 Scottish Publicly Owned Energy Company (POEC)

2.1 General views

A Scottish publicly owned energy company would be an opportunity to address market failures and support the development of a low-carbon energy system in Scotland. It offers the opportunity to support a just transition away from fossil fuel extraction and towards a low-carbon economy.

2.2 What role should it fulfil and how?

We consider that the POEC should invest in infrastructure to support a low-carbon economy. Supporting low-carbon energy should be part of the POEC's remit: this should include supporting the deployment of low-carbon hydrogen and low-carbon electricity; and should address the greenhouse gas impacts of industry by supporting the development of carbon dioxide (CO_2) transport and storage infrastructure.

Supporting carbon capture and storage (CCS) through the POEC would be a means of supporting the just transition, as well as contributing to circular economy objectives and delivering significant value for Scotland.

CCS has been shown to be the lowest cost means of decarbonising the economy, and the only way of decarbonising industries with process CO_2 emissions, or high heat demands that cannot realistically be met with electricity[1]. CCS refers to a suite of technologies in which CO_2 is separated from the other gases emitted by an operation, compressed, and then transported to offshore geological storage, either in disused oil and gas fields, or in saline aquifers. As well as its application to emissions from existing industry, CCS can be combined with steam methane reforming (SMR) to produce low-carbon hydrogen, which is CO_2-free at the point of use and can therefore be used to decarbonise heat and transport.

Deployment of CCS means that high emitting industries can continue to produce goods and provide employment in a low-carbon economy, by using the CO_2 takeaway service that CCS provides. The skills and expertise built up in the North Sea oil and gas industry will be needed to develop and operate CO_2 stores in the subsurface, and indeed these skills are already being used to identify

[1] Parliamentary Advisory Group on Carbon Capture and Storage (2016), Lowest Cost Decarbonisation for the UK: The critical role of CCS. Available at http://www.ccsassociation.org/news-and-events/reports-and-publications/parliamentary-advisory-group-on-ccs-report/

appropriate sites for secure CO_2 storage and develop pilot projects[2]. CCS could therefore be a key part of achieving a just transition in Scotland[3].

Studies into cost-effective deployment of CCS suggest that it should be split into two parts: carbon capture, which is particular to, and therefore owned by, a specific industrial operation; and transport and storage, which should be managed as shared infrastructure that is made available to companies that capture their CO_2[4]. A 2018 report for UK Government suggested that public ownership of the transport and storage infrastructure was the most appropriate model.[5]

Although the UK Government is currently carrying out further work to review delivery and investment models for CCS[6], the establishment of a POEC gives the Scottish Government the opportunity to take a public stake in the development of CCS infrastructure. There are several oil and gas pipelines that are at risk of imminent decommissioning, but which could be repurposed for CO_2 transport at significantly lower cost than building a new pipeline[7][8]. The POEC could take over ownership and maintenance of these pipelines until they can be used in a CCS project. Not only would this support the development of CCS in Scotland, it would be enable effective re-use of existing infrastructure, and avoid the need for decommissioning.

With the potential to support industrial decarbonisation and that of heat and transport through development of CCS infrastructure, as well as the potential to invest in low-carbon electricity generation, we consider that a POEC that solely took on the role of energy supplier (as suggested in the Strategic Outline Case[9]) would be a significant missed opportunity.

2.3 What are the key challenges that the POEC should address?

The central challenge for the POEC should be to reduce greenhouse gas emissions across the energy system.

The scoping note[10] provided for the Economy, Jobs and Fair Work Committee suggests four potential purposes of the POEC, two of which would support lowest cost decarbonisation using CCS:

- *Creating new infrastructure platforms*.
  We agree that the POEC "would be well placed to support investment in new infrastructure which others, including private companies, could then 'plug in to' to innovate and provide new energy services to consumers."[11] This should include investment in CO_2 transport and

[2] Including: CO_2Stored, see http://www.co2stored.co.uk/home/index; ACT Acorn, see https://actacorn.eu/downloads; Caledonia Clean Energy Project, see http://www.ccsassociation.org/news-and-events/reports-and-publications/caledonia-clean-energy-project-feasibility-report/
[3] For more information on the potential for CCS development in Scotland see http://www.sccs.org.uk/images/expertise/reports/working-papers/WP_SCCS_2016_01_Scottish_CO2_hub.pdf
[4] Parliamentary Advisory Group on Carbon Capture and Storage (2016), Lowest Cost Decarbonisation for the UK: The critical role of CCS. Available at http://www.ccsassociation.org/news-and-events/reports-and-publications/parliamentary-advisory-group-on-ccs-report/
[5] Pale Blue Dot Energy Ltd (2018) *CO_2 transport and storage: Review of business models (phase one*), available at *https://www.gov.uk/guidance/uk-carbon-capture-and-storage-government-funding-and-support*
[6] See https://www.gov.uk/guidance/uk-carbon-capture-and-storage-government-funding-and-support
[7] D Pilbeam, A Reid (2018). *Re-Use of Oil & Gas Facilities for CO2 Transport And Storage*. Available at: https://ieaghg.org/ccs-resources/blog/new-ieaghg-technical-report-2018-06-re-use-of-oil-gas-facilities-for-co2-transport-and-storage
[8] Marko Maver (2018) *The case for re-using infrastructure for CO_2 transport and storage*. Available at: https://actacorn.eu/blog/case-re-using-infrastructure-co2-transport-and-storage?utm_source=newsletter_90&utm_medium=email&utm_campaign=sccs-newsletter-september-2018
[9] Available at: https://www.gov.uk/guidance/uk-carbon-capture-and-storage-government-funding-and-support
[10] Ragne Low (2018) *Scoping Note on a Scottish Publicly Owned Energy Company* http://www.parliament.scot/S5_EconomyJobsFairWork/Inquiries/Scoping_note-Publicly_Owned_Energy_Company-Centre_for_Energy_Policy.pdf
[11] http://www.parliament.scot/S5_EconomyJobsFairWork/Inquiries/Scoping_note-Publicly_Owned_Energy_Company-Centre_for_Energy_Policy.pdf

storage infrastructure, including retention and maintenance of disused pipelines that could be repurposed for CO_2 transport in future.

- *Accelerating wider energy system transformation*.
  As well as the examples given in the scoping note, a significant role here could be in developing the market for hydrogen, building on current work to understand the issues around hydrogen deployment and giving strategic and direct support for the deployment of hydrogen for domestic heat, transport and, where appropriate, industry.

2.4 How can the POEC be best designed to align with wider Scottish energy policy objectives?

The Scottish Energy Strategy includes two broad scenarios: "a hydrogen future" and "and electricity future". It also recognises the importance of CCS in both these scenarios[12].

A POEC that delivers (or enables the delivery of) the infrastructure for CCS, would be consistent with the Energy Strategy and Climate Change Plan[13].

2.5 Should a new Scottish POEC be more than solely a licensed energy supply company?

The POEC should certainly be more than a licensed energy supply company, not least because energy supply companies with a social remit already exist and operate in Scotland. Simply adding another energy supply company to the market would be a significant missed opportunity to make a step-change in Scotland's energy landscape.

There may be a role for a POEC in energy generation; however, the existence of a pipeline of renewable energy projects in Scotland suggests that this is not an area where there is a market failure that needs to be addressed.

Instead, the role for the POEC should be in developing the infrastructure that is needed in a low-carbon economy.

2.6 How might the POEC be designed to promote objectives and functions beyond the retail of gas and electricity?

As stated above, the POEC should have the objective of reducing greenhouse gas emissions associated with energy and should create new infrastructure platforms and accelerate wider energy system transformation.

This would enable it to more fully support the aims of the Energy Strategy and the Climate Change Plan, enabling decarbonisation across the economy, as well as supporting a just transition in Scotland.

CCS has been shown to have the potential to deliver significant economic value, which is estimated at £5 for every pound spent: an East Coast CCS network, including Scotland, Teesside, Humber and the South East, has been estimated as providing benefits of £134bn, for a cost of £34bn; creating or retaining around 225,000 jobs; and capturing and storing around 1.5Gt of CO_2[14]. The benefits accounted for in this report are likely to be an underestimate, as the report underestimates the

[12] Available at: https://www.gov.scot/energystrategy
[13] Available at: https://www.gov.scot/Publications/2018/02/8867
[14] Summit Power (2017) *Clean Air, Clean Industry, Clean Growth: How carbon capture will boost the UK economy*. Available at http://www.ccsassociation.org/news-and-events/reports-and-publications/clean-air-clean-industry-clean-growth/

potential revenue from providing a CO_2 storage service for other countries: the UK has one of the largest CO_2 storage capacity potentials in Europe[15], so is in an enviable position to charge storage fees to other countries which develop CO_2 capture but do not have stores of their own.

In addition to the potential revenue from providing storage services, CO_2 storage would provide revenue to Scottish Ministers through the Scottish Crown Estate, which includes just under half the foreshore in Scotland, the seabed out to the 12 nautical mile (nmi) territorial sea limit, and rights for subsurface CO_2 storage out to 200 nmi. These assets are crucial to the development of CO_2 storage, and of CO_2 transport by ship or pipeline. Crown Estate Scotland (CES)'s interest in the foreshore, including ports and harbours, is also relevant to the development of CCS infrastructure. There is significant future revenue for CES from licensing CO_2 storage and leasing the territorial seabed and foreshore for related infrastructure, over several decades.

3 Scottish Carbon Capture & Storage

Scottish Carbon Capture & Storage (SCCS) is a research partnership of the British Geological Survey, Heriot-Watt University, University of Aberdeen, the University of Edinburgh and the University of Strathclyde with associate member the University of St Andrews. SCCS researchers are engaged in innovative applied research and joint projects with industry and government to support the development and commercialisation of carbon capture and storage as a climate change mitigation technology.

[15] Bentham, M., Mallows, T., Lowndes, J., and Green, A (2014), *CO2 STORage Evaluation Database (CO2 Stored). The UK's online storage atlas*. Energy Procedia, 2014, 63: 5103-5113. Available at: http://www.sciencedirect.com/science/article/pii/S1876610214023558?np=y