

The House of Commons Scottish Affairs Committee at Westminster has opened an inquiry into low carbon hydrogen production in Scotland as a follow up to their recent inquiry in 2021 on renewable energy in Scotland.

To what extent are the ambitions of the UK Hydrogen Strategy, published August 2021, adequate for Scotland?

We welcome the UK hydrogen strategy. However, in terms of grid-scale storage of hydrogen, it should be noted that the current hydrogen storage technology of hydrogen storage in solution-mined caverns developed in naturally occurring beds of halite is not a viable option onshore in Scotland (due to the absence of such rock types). We would therefore encourage alternative large-scale and inter-seasonal storage options to be researched. This should include assessing the storage of hydrogen in depleted hydrocarbon reservoirs or porous rocks, and could take the form of a research programme tailored to investigate the effect of hydrogen on bedrock units at elevated temperatures and pressures. In the case of hydrogen storage in porous rocks, this research should also include the potential for hydrogen storage to trigger the stimulation of microbial populations that may impact the efficiency of the storage unit. Additionally, the identification of suitable sites for cavern storage in the North Sea should be carried out.

If hydrogen storage is envisaged to be rolled out at scale, we would also recommend a review of the start-of-the-art for current monitoring strategies, and the development of innovative and appropriate monitoring strategies to ensure the safe and environmentally appropriate operation of storage facilities.

What role should the oil and gas industry play in achieving a “just transition” to blue and green hydrogen in Scotland?

We consider that the oil and gas industry has a potentially important role to play in a transition from blue to green hydrogen production. Recently completed research in the UK- and EU-funded ELEGANCY project indicates a substantial increase in the volume of carbon dioxide (CO₂) for permanent storage with implementation of large-scale blue hydrogen production in Scotland¹. Anticipated CO₂ supply is summed by year from publicly available industry plans and concepts. The summed values indicate the annual rates of supply planned by industry from present day to 2055. There is an increase from less than 2 million tonnes (Mt) CO₂ per year to approximately 9 Mt per year in 2030 with the planned implementation of blue hydrogen production in Scotland. The annual

¹ Tools and options for hydrogen and CCS cluster development and acceleration – UK case study, ELEGANCY project. *Proceedings of the 15th Greenhouse Gas Control Technologies Conference 15-18 March 2021*

rates of supply are indicated to continue to increase at a similar rate in the following decades to 2055. Plans for large-scale implementation of blue hydrogen should, therefore, also include appraisal and operation of CO₂ storage capacity. It is noteworthy that Scotland has a very substantial offshore subsurface geological storage resource and storage capacity is not a limiting factor. Options for green hydrogen production include generation of hydrogen from wind (including offshore wind) and solar energy sources. The potential co-location of suitable generation sites with storage sites in the offshore environment, taking advantage of existing oil and gas infrastructure (including platforms, pipelines and connectors) should be assessed in order to reduce initial capital outlay and re-use of infrastructure where possible.