

14 May 2020



Dear Clare,

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Scottish Hydrogen Assessment Questionnaire

Scottish Water welcomes the opportunity to respond to the Scottish Hydrogen Questionnaire.

Please find Scottish Water's response in the attached appendix (1). In this we have focused our response on where Scottish Water is well placed to make a contribution towards the development of the hydrogen economy in Scotland.

Together with our wholly owned subsidiary Scottish Water Horizons we have already delivered significant reductions in carbon emissions from our activities, increased energy efficiency and the deployment of cutting edge renewable technologies.

We have delivered exemplar projects in biogas generation and recovering energy from waste water, and we are now harnessing internal and external industry and academic expertise to explore the generation of green hydrogen on our assets to form part of a portfolio of actions to deliver on these ambitious targets. We would therefore welcome the opportunity to engage in the development of the *Hydrogen Strategy for Scotland*.

Please send any enquiries or further information to the email address above.

Yours sincerely

Simon Parsons
Director
Strategic Customer Service Planning

ENCS – Appendix 1 – Questionnaire; Appendix 2 – Respondent Information Form

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Appendix 1

Scottish Water's Response to the Scottish Hydrogen Assessment Questionnaire

12. In your view, what are Scotland's key natural and physical assets that can support the development of hydrogen energy systems?

The availability and quality of water is a key consideration when identifying suitable locations for hydrogen production, be it green hydrogen or blue hydrogen. The nature of our water environment is changing with recent weather patterns resulting in increased pressure on drinking water supplies in some regions of Scotland, which could be exacerbated in future by Climate Change. We would ask that Scottish Water is closely involved in the preparation of the strategy and decision on the future location of hydrogen production facilities, particularly where there could be an impact on drinking water sources and wider water resource availability noting that these impacts are often location specific.

Rather than relying on freshwater or water treated to drinking water standards, we believe that opportunities for using recycled water in hydrogen production should to be explored in developing Scotland's Hydrogen Strategy.

Our ongoing Hydrogen Feasibility Study will evaluate the technical and economic viability of producing hydrogen through electrolysis of recovered final effluent (the end product at our waste water treatment works, usually discharged to a nearby waterbody) and surface water discharges from sustainable urban drainage systems. The study combines existing proven technologies for effluent polishing, electrolysis of final effluent for hydrogen and oxygen production, and use existing renewable energy to power the process. Moreover, oxygen produced through the process can be readily used in the wastewater treatment processes onsite to optimise the aeration process and reduce energy consumption.

Our largest wastewater treatment works are located in large population centres, providing an accessible outlet for this green hydrogen either as a transport fuel, for injection into the gas grid or to store and use again in fuel cells or CHP.

The results from our study will be ready for publication later this year. Should these projects prove viable, the technology could be employed at a number of our treatment centres.

More generally, smaller scale hydrogen production facilities have the potential to exploit existing curtailed capacity of renewable energy, particularly smaller scale wind, solar and hydro schemes in more rural settings. We have many smaller scale renewable assets and we will continue to use our landbank to promote and develop growth in renewable energy generation such as hydrogen production. In collaboration with Stirling Council we are now providing low-carbon heat distributed along Stirling Council's District Heat Network. The heat generated by the heat from wastewater technology alongside a combined heat and power engine is stored and distributed through the local District Heat Network when required. These emerging district heating networks could also utilise by-product heat from electrolysis, hydrogen fuel cells or boilers to create decentralised district heating systems.

13. What is your view on Scotland's preparedness for an expansion of hydrogen within our energy systems?

We have limited our response here to hydrogen for use as a transport fuel based on our views as a potential consumer.

We operate a large and diverse fleet, which serves our assets and communities nationwide. As part of our efforts to reduce carbon emissions, we evaluate opportunities to replace our existing fleet with electric or alternative fuel vehicles as part of our standard vehicle replacement cycles, taking into consideration vehicle capability (payload, range etc.) and additional capital costs (vehicle purchase price and infrastructure). We have been trialling electric vehicles on our fleet for the last year and are now trialling our first van powered by electric and hydrogen fuel cell extender in Aberdeen, where hydrogen infrastructure is already in place. We see a role for hydrogen as the future fuel for larger commercial vehicles and HGVs. To enable this, a network of hydrogen production and distribution facilities will be required to facilitate the transition.

15. Should you wish to make any further comments or observations around the current state of the hydrogen economy in Scotland, or how you think it is likely to develop, please make these below.

Scottish Water is keen to be an active participant in the development of the hydrogen economy in Scotland. We believe Scottish Water to be a key stakeholder in identifying locations involving potable or treated water for use in any part of the production process; particularly in view of the possible water resource impacts.