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| Network Innovation Competition 2020 Supplementary Answer form | | |

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| Project Name | H100 Fife | | |
| Question number | #5 | Pro forma section | 3 |
| Question date | 20/08/20 | Answer date | 24/08/20 |
| Question summary | Please explain why an 'end-to-end' demonstration project is required to deliver data on cost. Further, please identify where those unknown costs in the H2 economy lie, ie in networks, production, storage, domestic appliances. | | |

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## Answer (please retain document formatting and do not exceed 2 pages unless otherwise agreed with Ofgem)

Also referenced in Q2 of Supplementary Questions, in order to facilitate the demonstration of a 100% hydrogen network, an end to end system from production to final use is required to provide critical evidence and learning on whole system interdependencies to policy makers, industry, the gas networks, customers and stakeholders.

The proposed project will allow the trade-offs and interdependencies between different components in the whole system to be visible and analysed, allowing system optimisation and technology learnings that can lead to cost reduction opportunities, supported by the integrated control system. This submission can offer insight which is scalable and will help to answer unknowns such as system optimisation through sequencing and profiling of hydrogen production and storage to offset redundancy. In addition, this project will help shape the required commercial and regulatory models for the operation of a 100% green hydrogen network all the way from turbine blade to customer use. We expect to gain a greater understanding of costs associated with appliance operation, hydrogen distribution, green hydrogen production, hydrogen storage, system redundancies, control system optimisations (from operational history) and all interactions between whole system components and the cost trade-offs between them. As with all innovation projects, the cost trade-offs for first of a kind are disproportionately higher than at scale, but the project seeks to provide clarity on future cost reduction opportunities. The project has been designed at all stages to maximise value for money and reduce cost uncertainty as referenced in Section 4.2.2.

More widely, H100 Fife will provide SPEN (and other DNOs) and the offshore wind industry with detail of the demand profile for power from the grid for scalable hydrogen production to inform future planning requirements. This will allow the power sector to work with the GDNs to develop future power to hydrogen connections for heat and make cost of capacity assumptions to support this. H100 Fife will also enable learnings for Scottish Water to improve their understanding of scalable hydrogen production and the potential impact on its future demands for abstractions such as reservoirs and asset investments.

The construction and operation of H100 Fife will unlock access to data on the system optimisation, engineering maturity and cost learning of all components across the system and how they interface together.