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| Network Innovation Competition 2020 Supplementary Answer form | | |

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| Project Name | H100 Fife | | |
| Question number | #20 | Pro forma section | 5 |
| Question date | 10/09/20 | Answer date | 14/09/20 |
| Question summary | Why do you think there may be a business model developed by the project that can be adopted more widely given that the GB-scale build of a dedicated hydrogen network is not a feasible solution? | | |

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

You are correct to point out that understanding the rollout potential of hydrogen conversion of distribution networks is critical to the success or otherwise of hydrogen as a decarbonisation solution. Replacement of 280,000km of distribution pipe is unlikely to be deliverable in time to meet net zero. Thus, understanding the suitability of the distribution system and customer aspects is of primary importance. Other aspects of the system, such as the future of the local transmission, system operation and the national transmission system are also very important, but any solution for these aspects will be determined by what we need to do at a distribution and customer level. It is anticipated for example that the early hubs for hydrogen production will align with the industrial clusters, therefore understanding the potential for hydrogen for heat will have a significant bearing on the design of these systems and assets.

The H100 Fife project will evidence critical understanding of network management and operation. For example, to understand how to scale hydrogen production and storage requirements, we need to understand how to match supply and demand. This will help determine interventions required for the networks, such as additional storage requirements for within day and intra-seasonal. This evidence is needed not only for GDN’s, but for a range of stakeholders, from water companies and power system operators to renewables investors and operators. The project will also provide full visibility of the regulatory aspects, from turbine tip to burner. This insight will support future regulatory models.

It is not true to suggest that no models for local production will be evidenced by the project. The project will deliver an end to end system that can be scaled for roll-out to sections of the network or areas in GB where alternative decarbonisation solutions may not be the most cost-efficient, feasible or desirable solution for the customer. Where there is an abundance of renewable energy that is constrained, hydrogen can afford maximum economic recovery of energy when paired with storage. Off-grid areas like Machrihanish where the feasibility and FEED study undertaken during H100 NIA demonstrated that installing a hydrogen end to end system could result in lower customer heating bills (currently all electric) if local renewable production investments were scaled up and if H100 Fife is successful. The business model developed by H100 Fife supports investment in hydrogen generation and appliances, creating a market for renewable hydrogen systems for use in domestic, commercial and transportation applications. For appliances, it is possible to link heat policy decisions, such as the mandating of hydrogen ready boilers to the success of the project, which would significantly reduce conversion costs in the early 2030’s.

The construction and operation of a hydrogen production and distribution system with future opportunities for expansion to industry and transport, demonstrates the versatility of a hydrogen economy and sets out a proposed pathway to an inclusive, replicable hydrogen hub in Levenmouth, Fife. The business model developed by H100 Fife will be a catalyst for the hydrogen market allowing commercial clusters, hubs and facilities to be replicated in hydrogen ‘hotspots’ across the country i.e. areas of constrained wind, abundant water sources, geological storage locations.