

Notes on Completion: Please refer to the appropriate NIA Governance Document to assist in the completion of this form. The full completed submission should not exceed 6 pages in total.

NIA Project Registration and PEA Document

Date of Submission

Dec 2021

Project Reference Number

NIA2_SGN0009

Project Registration

Project Title

H100 Fife Phase 2 Village Pre-FEED

Project Reference Number

NIA2_SGN0009

Project Licensee(s)

SGN

Project Start

October 2021

Project Duration

0 years and 7 months

Nominated Project Contact(s)

Stephen Tomlinson, H100 Fife Programme Lead
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Project Budget

£750,000.00

Summary

In November 2020, the Prime Minister's 10-point plan set out the low carbon ambitions for the UK including the route to hydrogen, highlighting the UK's world leading status in hydrogen for heat and giving direct mention to the H100 Fife demonstration (Phase 1) intending to deliver hydrogen for heat to 300 homes. This commitment sets out the aim to deliver a 'Hydrogen Neighbourhood' by 2023 (H100 Fife NIC), a 'Hydrogen Village' by 2025 and a 'Hydrogen Town' before the end of this decade. The UK Government, specifically BEIS, has adopted this strategy to deliver its Hydrogen Trials Programme, which it is looking to the GDNs to deliver and have extensively engaged with SGN and the other GDNs in doing so. This has culminated in the development of the programme, which will be run as a competition for both the 'village' and the 'town'. The Project will deliver the pre-FEED to support the delivery of a future hydrogen village trial.

Third Party Collaborators

Arup

Nominated Contact Email Address(es)

sgn.innovation@sgn.co.uk

Problem Being Solved

The gas networks have set out a portfolio of work to deliver evidence for the transformation of the network in the form of a pathway to decarbonisation.

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(H100 Fife NIC), a 'Hydrogen Village' by 2025 and a 'Hydrogen Town' before the end of this decade. The UK Government, specifically BEIS, has adopted this strategy to deliver its Hydrogen Trials Programme, which it is looking to the GDNs to deliver and have extensively engaged with SGN and the other GDNs in doing so. This has culminated in the development of the programme, which will be run as a competition for both the 'village' and the 'town'. The Project will deliver the pre-FEED to support the delivery of a future hydrogen village trial.

Method(s)

The Pre-FEED stage will align to the following method:

1.1. Trial project summary

To determine the population and geographical coverage, number and range of gas customers and the strategies that could be employed for hydrogen conversion

1.2. Plan, timetable and scope of work for subsequent stages

The development of a plan for detailed design and a high-level plan and schedule for other stages of the trial

1.3. Evidence and benefits plan

The evidence/benefits plan will provide an assessment of the quality and comprehensiveness of evidence the trial project will provide. The plan will include the benefits, when the benefits will be realised and an explanation as to how the trial will enable these benefits

1.4. Cost estimates, for the full lifetime and the full costs of the trial project

the expected costs and profile of expenditure over the full lifetime of the project

1.5. Organisation of responsibilities and liabilities

a description of the proposed organisational, funding and legal arrangements with project delivery partners, and suppliers, describing their respective responsibilities and liabilities, including for procurement, ownership and delivery of assets and services and associated liabilities

1.6. Safety Case Development Strategy

The document will include the planned technical approach to risk assessment and mitigations, the main potential hazards, the plan for delivering the necessary risk assessment and a roadmap to meet the requirements of the relevant health and safety regulatory framework

1.7. Regulatory plan

a summary of regulatory frameworks potentially impacting on the design, feasibility or timeline of the project (eg. GDN licence conditions, planning regulations, environmental requirements) with a timetable of regulatory compliance activities and a description of any regulatory barriers

1.8. A statement of the options identified for meeting requirements for hydrogen supply and resilience

identification of reliable and resilient hydrogen supply solution(s) for the proposed trial site and evidence of support from any third parties who would be partners on the project and responsible for delivering hydrogen production

1.9. A statement of infrastructure requirements

a description and an outline strategy and timeline for the design, procurement, construction and/or adaptation of infrastructure required

1.10. Public engagement evidence

evidence of engagement with local partners, local representative authorities and/or consumer groups, including stakeholders that support consumers with additional needs and consumers in vulnerable situations, and a summary of feedback received

1.11. Public engagement strategy

the plan for extending engagement and consultation with communities, local authorities, and representative organisations in the

Detailed Design stage.

1.12. Proposals for a consumer strategy, ensuring fair treatment for all gas consumers in the trial locality

a strategy for establishing all customers requirements, assessment of risks and planned approaches and outline of billing solutions

1.13. Supply chain strategy

assessment of the required range and volume of appliances, ancillary devices (eg meters), and any other necessary installations,

1.14. Workforce capability, skills and training plan

identification of the workforce and training requirements needed to successfully deliver the proposed trial, and a plan to show how these needs would be met (eg recruitment, certifications, competency assessments)

1.15. Exit plan

1.16. outline plans for two possible scenarios: 1. the continuation of the project; 2. ending the project within 1-3 years of trial commencement and the reinstatement of natural gas supplies

2. Proposal for delivery of FEED study (Stage 2)

proposal including a level 2 project plan to meet all identified Counterparty deliverables required for FEED (stage 2) with a high-level route map to scale H100 Fife Phase 1 to meet the requirements of a 'Hydrogen Village' and a 'Hydrogen Town'.

3. Identify an initial concept design for the H100 Fife Village Trial that considers the balance of deliverability/programme, value for money and Evidence Benefits

Completed cost/benefit of a project utilising the existing neighbourhood electrolyser and current site vs a 2000 home concept

Scope

This study focuses on the preliminary and detailed design of a hydrogen village trial with elements of grid conversion and customer opt-in. The outputs will include a report to BEIS setting out the business case across the categories of safety, technical, delivery, customer acceptance, economics and data, providing an overall assessment for H100 Fife progressing into the build phase of the hydrogen village trials programme. It will scope out the work package breakdown for the FEED phase, including a roadmap and level 3 programme, with provision for stakeholder engagement, communications and project management support function

Objective(s)

The objectives of the Project are to determine the;

- outline design for a logical expansion of H100 Fife to 1000+ homes
- schedule for delivery
- hydrogen conversion strategy
- Capital cost estimate
- Regulatory milestones and constraints
- Training and competency requirements
- Exit strategy
- FEED project plan
- Key stakeholders

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

This is a desktop-based study and therefor does no impact consumers in vulnerable situations

Success Criteria

Success criteria for the project will be as follows:

Delivery of a pre-FEED report outlining the Objectives

Project Partners and External Funding

Arup

Potential for New Learning

The learnings of this project will provide knowledge to BEIS and industry on pre-FEED methods for domestic hydrogen conversions. The learnings will be shared through the Smarter Networks Portal

Scale of Project

The Project is focusing on the Levenmouth area of Fife, Scotland. The learnings from the project (pre-FEED hydrogen conversion methods) can be replicated across the UK.

Technology Readiness at Start

TRL2 Invention and Research

Technology Readiness at End

TRL4 Bench Scale Research

Geographical Area

Levenmouth, Fife

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

£750,000

Project Eligibility Assessment Part 1

There are slightly differing requirements for RIIO-1 and RIIO-2 NIA projects. This is noted in each case, with the requirement numbers listed for both where they differ (shown as RIIO-2 / RIIO-1).

Requirement 1

Facilitate the energy system transition and/or benefit consumers in vulnerable situations (Please complete sections 3.1.1 and 3.1.2 for RIIO-2 projects only)

Please answer **at least one** of the following:

How the Project has the potential to facilitate the energy system transition:

The Project forms part of the Government's Ten Point Plan for a 'Hydrogen Village'. The Project will provide the necessary information to progress to demonstration phase if successful in Government funding bid

How the Project has potential to benefit consumer in vulnerable situations:

N/A

Requirement 2 / 2b

Has the potential to deliver net benefits to consumers

Project must have the potential to deliver a Solution that delivers a net benefit to consumers of the Gas Transporter and/or Electricity Transmission or Electricity Distribution licensee, as the context requires. This could include delivering a Solution at a lower cost than the most efficient Method currently in use on the GB Gas Transportation System, the Gas Transporter's and/or Electricity Transmission or Electricity Distribution licensee's network, or wider benefits, such as social or environmental.

Please provide an estimate of the saving if the Problem is solved (RIIO-1 projects only)

N/A

Please provide a calculation of the expected benefits the Solution

N/A

Please provide an estimate of how replicable the Method is across GB

The Pre-FEED Method can be replicated to determine the suitability of any particular locations for hydrogen conversion

Please provide an outline of the costs of rolling out the Method across GB.

To be determined as will be a function of geography and technology options

Requirement 3 / 1

Involve Research, Development or Demonstration

A RIIO-1 NIA Project must have the potential to have a Direct Impact on a Network Licensee's network or the operations of the System Operator and involve the Research, Development, or Demonstration of at least one of the following (please tick which applies):

- A specific piece of new (i.e. unproven in GB, or where a method has been trialled outside GB the Network Licensee must justify repeating it as part of a project) equipment (including control and communications system software).
- A specific novel arrangement or application of existing licensee equipment (including control and/or communications systems and/or software)
- A specific novel operational practice directly related to the operation of the Network Licensees system
- A specific novel commercial arrangement

RIIO-2 Projects

- A specific piece of new equipment (including monitoring, control and communications systems and software)

- A specific piece of new technology (including analysis and modelling systems or software), in relation to which the Method is unproven
- A new methodology (including the identification of specific new procedures or techniques used to identify, select, process, and analyse information)
- A specific novel arrangement or application of existing gas transportation, electricity transmission or electricity distribution equipment, technology or methodology
- A specific novel operational practice directly related to the operation of the GB Gas Transportation System, electricity transmission or electricity distribution
- A specific novel commercial arrangement

Specific Requirements 4 / 2a

Please explain how the learning that will be generated could be used by the relevant Network Licensees

The Pre-FEED Method can be utilised by the GDNs to determine the suitability of any particular locations for hydrogen conversion

Or, please describe what specific challenge identified in the Network Licensee's innovation strategy that is being addressed by the project (RIIO-1 only)

N/A

Is the default IPR position being applied?

- Yes

Project Eligibility Assessment Part 2

Not lead to unnecessary duplication

A Project must not lead to unnecessary duplication of any other Project, including but not limited to IFI, LCNF, NIA, NIC or SIF projects already registered, being carried out or completed.

Please demonstrate below that no unnecessary duplication will occur as a result of the Project.

A pre-FEED study for the conversion to hydrogen in Levenmouth, Fife is not being progressed elsewhere. In addition the proposal is that Safety Case work will be shared across the GDN's and pooled as a common appendix for all submissions to avoid unnecessary duplication.

If applicable, justify why you are undertaking a Project similar to those being carried out by any other Network Licensees.

N/A

Additional Governance And Document Upload

Please identify why the project is innovative and has not been tried before

The production, storage, distribution and utilisation of hydrogen for domestic heat has not been done before. The end-to-end system is novel.

Relevant Foreground IPR

N/A

Data Access Details

Any consumer data gathered throughout this project will be compliant with General Data Protection Regulations (GDPR) and the UK Data Protection Act. Any compliant data can be made available for review upon request

Please identify why the Network Licensees will not fund the project as part of it's business and usual activities

Development of hydrogen networks is not yet a business-as-usual activity

Please identify why the project can only be undertaken with the support of the NIA, including reference to the specific risks(e.g. commercial, technical, operational or regulatory) associated with the project

Development and operation of hydrogen networks is still in the R&D phase. NIA funds need to be utilised to raise the TRL to 7-9.

This project has been approved by a senior member of staff

Yes