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NIA Project Registration and PEA Document

Date of Submission

Feb 2022

Project Reference Number

NIA2_SGN0016

Project Registration

Project Title

Glenmavis Masterplan Options Appraisal

Project Reference Number

NIA2_SGN0016

Project Licensee(s)

SGN

Project Start

January 2022

Project Duration

0 years and 8 months

Nominated Project Contact(s)

Alastair.Scott@sgn.co.uk

Project Budget

£49,000.00

Summary

SGN own a number of sites across Scotland and the South of England, many of which sit largely underutilised but have significant potential for development as part of the end-to-end net zero gas network system of the future. This project will undertake pre-concept work on the Glenmavis and Dunfermline sites to assess the use of integrated infrastructure in order to support wider SGN decarbonisation objectives. This project proposes to assess the potential for blue and/or renewable energy/green hydrogen production at the Glenmavis site and the potential for renewable energy generation/green hydrogen production at the Dunfermline site.

The major focus of this project is Glenmavis, which has significant potential to act as a key energy hub in SGN's vision for a net zero network in Scotland.

Third Party Collaborators

Wood PLC

Nominated Contact Email Address(es)

sgn.innovation@sgn.co.uk

Problem Being Solved

The Scottish Government have committed to reducing greenhouse gas emissions to net zero by 2045, with challenging interim targets including one million domestic properties on net zero heating technologies by 2030. 80% of properties in Scotland are heated by natural gas boilers, and the system transition of the gas networks from natural gas to 100% hydrogen offers to customers and policy makers, a potentially low disruption and low-cost decarbonisation pathway of the heating demand of Scotland's housing stock and industry, retaining the continued use of SGN's extensive and advanced gas network infrastructure. SGN, working collaboratively with the wider gas industry, aims to prove and demonstrate the safe and practical transportation of 100% hydrogen through its networks by 2026.

In parallel, significant work, in conjunction with industry and prospective hydrogen producers, is ongoing to develop regional infrastructure construction and conversion plans to enable the timely conversion of the gas networks to hydrogen, in line with mandated Government decarbonisation targets, once policy, underpinned by R&D and demonstrations workstreams, permits such work.

SGN own a number of sites across its networks, sitting underutilised but with significant potential for development. This project will consider two sites in Scotland at Dunfermline and Glenmavis for a potential role in the end-to-end system of the future, maximising optionality. The major focus of this project is the site at Glenmavis, a significant area of land and offtake from the NTS, which has significant potential to act as a key energy hub in SGN's vision for a net zero gas network in Scotland. The site at Dunfermline has the potential to play a role in the future net zero whole system in Fife.

This project proposes to assess the potential for blue and/or renewable energy/green hydrogen production at the Glenmavis site and the potential for renewable energy generation/green hydrogen production at the Dunfermline site.

Method(s)

The project will carry out the following tasks:

- Energy Yield Assessment of both sites from wind and solar generation.
- Hydrogen production feasibility at Glenmavis for blue and green hydrogen.
- Supporting infrastructure review of utilities required to supply potential developments, considering electricity, natural gas and water requirements.
- A planning review to consider local planning requirements and any potential development barriers.
- A reporting summary of all outcomes and recommendations.

The project outputs include a summary report and a presentation of findings.

Scope

The project proposal is outlined below:

Task 1 – Energy Yield Assessment

- Initial site screening assessment to determine local wind and solar resource (Glenmavis and Dunfermline sites).
- Site constraints map to determine opportunities for wind and solar development at both sites.
- Initial energy yield assessment combining outputs from site resource screening and overall development constraints map.

Task 2 – Hydrogen Production Feasibility

- Initial assessment of capacity and scale of SMR blue hydrogen production feasible at Glenmavis site. This to include resource requirements in respect of power, gas, and water.
- Assess green hydrogen supply production based on available on-site renewable energy resources.
- Summary position of technical feasibility of hydrogen outputs (blue and green).

Task 3 – Supporting Infrastructure Review

- Review of existing understanding of utilities serving Glenmavis site and available capacity in respect of grid electricity, potable water and gas connection infrastructure.
- Review of CO2 removal options from the Glenmavis site (high level pipeline routing options and commentary on crossing/planning issues that would need addressing).
- Summary commentary of how current availability of relevant utilities impacts on technical feasibility of production.

Task 4 – Planning Review

- Review of relevant local planning guidance and aspects of local development plan relevant to development at both sites.
- Executive summary of planning 'showstoppers' (if any) and outline of process by which proposed assets would follow to achieve planning and environmental consents.

Task 5 – Reporting Summary

- Technical report summary of findings and recommendations for Phase 2 study for discussion with SGN team.

Deliverables

- Masterplan summary Report: Summary of study tasks and outputs and recommendations for next steps in site development.

- Presentation of findings: Summary presentation of key findings and proposal for next steps.

The expected outputs from each task are as follows:

- Task 1 – Understanding of each site’s capacity to support renewable energy production
- Task 2 – Understanding of the Glenmavis site’s potential scale of opportunities for blue and green hydrogen production
- Task 3 – Understanding of constraints/opportunities of existing utilities
- Task 4 – Understanding of planning requirements for specific projects
- Task 5 – Understanding of optimised future site opportunities

Objective(s)

This project will undertake pre-concept work on the Glenmavis and Dunfermline sites to assess the use of integrated infrastructure in order to support wider SGN decarbonisation objectives.

This project will assess the feasibility of, and quantify, the potential for blue and/or renewable energy/green hydrogen production at the Glenmavis site and the potential for renewable energy generation production at the Dunfermline site.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

Not Applicable

Success Criteria

- Clear evidence of the completed work under each task as outlined in the proposal
- Fully reviewed and accepted summary report at the conclusion of the project
- Clearly justified outcomes and recommendations for next steps.

Project Partners and External Funding

Project partners for the study will be Wood Group U.K. Ltd

Potential for New Learning

This project will provide a pre-concept assessment of the Dunfermline and Glenmavis sites’ potential for the use of integrated infrastructure in order to support wider SGN decarbonisation objectives. The key new learning from this project is the range of development opportunities feasible which have the potential to form a key element in the end-to-end net zero system required to deliver a decarbonised heating and industrial sector in Scotland.

Glenmavis is of particular interest due to its highly strategic location, characteristics and criticality in Scotland’s whole system energy supply and balance.

This project will output recommended next steps for consideration using a methodology potentially applicable at other sites across the UK.

Scale of Project

The project will be primarily desktop based

Technology Readiness at Start

TRL2 Invention and Research

Technology Readiness at End

TRL3 Proof of Concept

Geographical Area

The geographical area for the project will be the sites at Glenmavis and Dunfermline, with consideration given to the supply to the wider gas network from Glenmavis

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

£58,803

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:

This project has the potential to identify the opportunity at a key strategic location, which could play a key role in the end-to-end system design of Scotland's future net zero gas network.

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 focus of the study is at Glenmavis and Dunfermline, however, the methodology developed in the project has the potential to be used at similar sites elsewhere in GB

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

NA – The methodology is likely to be very site specific

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 trialed 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 process and methodology proposed for Glenmavis and Dunfermline, considering the feasibility of development and potential scale of such developments considering utility inputs and planning requirements has the potential to be loosely applied at other sites across GB (site specific)

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.

No other study of this scope has been carried out at these sites to date

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

This consideration of underutilised sites for development in this way and as part of the energy system transition is innovative for SGN and if successful, could lead to the application of this methodology at other similar sites. This project will provide optionality as to the design of the end-to-end system and provide a potentially major development opportunity.

Relevant Foreground IPR

N/A

Data Access Details

The project will require key gas network infrastructure data (which will be provided by SGN), energy yield assessment data for renewables and other utility data from electricity and water networks. Data outputs from the project will help inform next steps of development and high level data outputs, such as capacity potential, may be available on request.

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

activities

This project is directly linked to SGN's energy system transition planning to enable the safe and practical transition to a net zero gas network and is therefore not part of the business as usual activities of the business

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

The NIA framework offers a robust, open framework to support this work and ensures the results are disseminated to all licenses. There are risks associated with development of the outputs from this project if hydrogen is not accepted as a means to heat homes in 2050. The technical, operational and regulatory risks around hydrogen are elements currently being explore across the networks providing mitigation to this potential risk. This project is suitable for NIA funding due to its low TRL and relevance to the energy system transition.

This project has been approved by a senior member of staff

Yes