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

Sep 2024

Project Reference Number

NIA_NGT0241

Project Registration

Project Title

Hydrogen Behavioural Change

Project Reference Number

NIA_NGT0241

Project Licensee(s)

National Gas Transmission PLC

Project Start

September 2024

Project Duration

0 years and 4 months

Nominated Project Contact(s)

Katie Jones, box.GT.innovation@nationalgas.com

Project Budget

£197,929.00

Summary

National Gas is transitioning away from natural gas and towards net zero alternatives including hydrogen and potentially carbon dioxide transportation. The conversion of the National Transmission System into a hydrogen transmission network has been widely discussed and extensive work is underway to prove the technical capability and commercial viability of a 100% hydrogen network. However, it is recognised that this is a significant change on people both internally within the business and with external stakeholders to support this change and enable National Gas to implement an energy transition in a safe way.

Nominated Contact Email Address(es)

Box.GT.Innovation@nationalgrid.com

Problem Being Solved

National Gas Transmission are working to decarbonise the gas grid by transporting hydrogen rather than natural gas. This represents a significant change for both internal and external stakeholders.

Part of the challenge is a lack of understanding and engagement in these changes that will take place and the change is significant both for internal stakeholders and external stakeholders as it will affect internally many people's daily tasks, responsibilities, but also externally the everyday of broadly where we get our energy from and the advantages of these changes. The aim of this project is to understand the internal attitudes of stakeholders and why they may be resistant to change (whether they have any safety concerns) or may be ambivalent towards the energy transition. The project will also understand novel behavioural change methodologies which could support NGT's energy transition, with recommendations for where to focus in the future.

Method(s)

Arcadis will uncover the mechanisms of successful behaviour change, understand the reasons behind failures, and assess the impact of both by doing a global benchmark- this will enable them to find global insights and proven strategies. This will be done in desk-top based studies but also in person workshops to understand where these barriers for the hydrogen transition internally are coming from and what options we have going forward. We will be liaising with both the HR team but also people across the GDN's.

Data gathering will be carried out by Arcadis personnel, with support from the relevant National Gas teams.

Measurement Quality Statement

The measurement approach used to meet Data Quality objectives will be through the identification of high calibre project partners who are experts in their given field. The methodology used in this project will be subject to our supplier's own ISO 9001 certified quality assurance regime and the source of data, measurement process and equipment as well as data processing will be clearly documented and verifiable. The measurements, designs and economic assessments will also be clearly documented in the relevant deliverables and final project report and made available for review.

Data Quality Statement (DQS)

The project will be delivered under the NIA framework in line with the agreed Energy Networks Innovation Process document and NGT internal policies. Data produced as part of this project will be subject to quality assurance to ensure that the information produced with each deliverable is accurate to the best of our knowledge and sources of information are appropriately documented. All deliverables and project outputs will be stored on our internal SharePoint platform ensuring backup and version management. Relevant project documentation and reports will also be made available on the ENA Smarter Networks Portal and dissemination material will be shared with the relevant stakeholders.

Scope

This project will consist of 4 work packages:

WP1: Case Study Review:

This work package will review available literature and best practice examples of novel behavioural change approaches (including nudge) from across Global energy networks, other TSOs and relevant other industry practices.

It will:

1.1 Identify energy behaviour change case studies within energy sectors around the world and through that create an analysis report of behaviour change work in the industry. Arcadis will leverage their expansive global network to identify case studies that not only showcase successful cultural transformations but also highlight diverse engagement strategies across key industries.

1.2 Identify other industries that has undergone or undergoing significant change and how they are managing this change and through this create an analysis report of behaviour change work in different industries. Arcadis will do a detailed examination to reveal the links between actions and their impact and develop practical recommendations rooted in the reality of what works and what doesn't.

1.3 Establish lessons learnt from unsuccessful change scenarios or scenarios with sub-optimal results. Arcadis will establish what needs to be avoided for behaviour change methodologies and what happens without behaviour change work. They will perform a detailed review of existing literature and NGT's research, supplemented by first-hand accounts from our global network to ensure a balanced perspective, combining academic rigor with practical insights.

1.4 Perform a global case study review- Arcadis will carry out a review of literature of the topic of novel behavioural change approaches, including nudge theory but not limited to and how this can support change within NGT for the net zero agenda. They will be engaging directly with a range of stakeholders from different sectors & levels to understand the subtleties of what has driven genuine & sustainable behaviour change and what has not, and also social listening and scouring social media communities to unearth authentic case studies that offer unique insights and are not readily accessible elsewhere to understand the factors contributing to the success or failure of change initiatives and the pathways to lasting change.

1.5 Project Management

Maintain robust project management to adhere to time, cost, quality objectives, with supporting documentation. Ensure the delivery of essential project milestones and events; including kick-off session, workshops, regular project meetings, quarterly steering group sessions, project closure review as appropriate. Arcadis will be adopting a dynamic and iterative approach, adapting and refining insights based on the latest developments and learnings to ensure that our research approach generates maximum impact.

WP2: Method Options and Theory

This work package will be: Evaluating a full range of change methodologies and cost-benefit analysis.

There will be a concise analysis of diverse behaviour change methods: outlining core principles, effectiveness, and possible limitations. An output of this will be A clear explanation of the theories underpinning each methodology, for example Social Learning Theory and Self-Determination Theory and A breakdown of potential implementation costs and potential benefits such as increased employee engagement and reduced resistance. This will leverage insights from Work Package One to identify real-world examples within the energy sector and relevant industries, showcasing both successful applications and challenges to consider

From this, a methodologies review will be the output.

WP3: Stakeholder Analysis

This work package will engage with stakeholders internally and externally to see where the problems lie and who is most affected. For this, there will be a series of workshops done with National Gas' people team, and also with GDN's to see first-hand what the common problems are and share insights. This session will also highlight any safety concerns made to them. The workshops will determine how urgent this behaviour work is and which areas to prioritise. It will also look at what's been perceived externally to start work for the HSE points D21-26

Arcadis will leverage Dynamic Engagement Networks © to build shared understanding, uncover and prioritise employee concerns hindering buy-in, anxieties and behavioural barriers related to the transition They will undertake a DEN© with GDN's and National Grid to explore challenges faced across the hydrogen adoption landscape, fostering collaboration and a shared understanding of wider industry roadblocks. They will then use the data generated from the DENs© and interviews and conversations as necessary to deepen the understanding of blockers faced by key stakeholders and the connections between them through data collection and gap analysis

WP4: Standards and Reporting

This work package will be focussed on NIA reporting- creating a final technical report with a technical summary and the closure report.

Arcadis will consolidate data and outputs from WP 1-3, synthesising insights from interviews, DEN©, and other data collection methods. They will summarise key findings, highlighting key insights and raise recommendations on best-fit models and change methodology Facilitate production of an ENA Closure report based on the Technical Summary.

Objective(s)

1. Look globally at past big scale transitions and what companies did to manage these or bring reluctant stakeholders on board (both internal and external)

2. Identify toolkits, approaches and methodologies to support behavioural change in the energy transition.

3. Do internal engagement with the people team and within the wider business to identify blockers, behaviours and barriers and safety concerns. Give recommendations for next steps and things to avoid and how to approach external engagement. Have engagement sessions with GDN's to understand where they see the blockers internally and externally.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

An assessment of distributional impacts (technical, financial and wellbeing related) for this project has been carried out using a bespoke assessment tool, which assesses the project as having a positive, negative or neutral effect on consumers in vulnerable situations. To help inform the assessment, this tool considers the categories of consumers identified in the Priority Services Register. This project has been assessed as having a neutral impact on customers in vulnerable situations. This is because it is a transmission project that is mostly desktop based.

Success Criteria

The following key criteria need to be met for the project to be considered successful:

- For the project to be delivered on time in full and to a high quality
- To understand behaviour change options for the future and be able to identify the options which are most suitable
- To understand globally what other practices have happened and understand the lessons learnt from these

Project Partners and External Funding

Lead network: National Gas Transmission plc

Lead supplier: Arcadis

External funding - £148,477

Potential for New Learning

We will be able to gain information around what the barriers internally to adopt hydrogen change are and the methodologies which will be most appropriate to implement steps to enact this change.

Scale of Project

The scale of the project is sufficient to show where the key areas of interest for further work would be in behavioural change for internal stakeholders. This project will also be able to explore all options available to NGT so that in potential further phases of this project, there will be enough information to make an educated decision for next steps and developing something which can be used within National Gas and other networks to implement meaningful change for the energy transition. This project should act as a good stage gate for next steps because we will be able to see whether there are any tools that would be appropriate and give enough benefits for implementation.

Technology Readiness at Start

TRL1 Basic Principles

Technology Readiness at End

TRL3 Proof of Concept

Geographical Area

Desktop study – UK, for workshops will be using Arcadis facilities

Revenue Allowed for the RIIO Settlement

None – hydrogen behaviour focussed project

Indicative Total NIA Project Expenditure

Internal funding - £49,482.33

External funding - £148,447.00

Total project funding - £197,929.33

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 will enable us to make sure the business is best motivated for the energy system transition and ensures the supply chain stability (we need experienced people to make sure that they are ready to still work on a hydrogen network as they have been on a methane network). This project will also enable the subject matter experts to engage more fully in the future with hydrogen projects, thus gaining another level of safety and value to these projects.

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

Value tracking	Data Point	Data Point Definition
Maturity	TRL 1-3	At concept level (NIA project)
Opportunity	100% or multiple asset classes	Will not be specifically looking at technical assets but employees affected in the future can be from any area of assets
Deployment costs	£0	Unknown deployment costs, research project
Innovation cost	£197,929.33	Cost of innovation project
Financial Saving	£0	Unknown at project start, research project
Safety	0	Not project focus
Environment	0.0	Unknown at project start, will know in time
Compliance	Support compliance	
Skills & Competencies	No change	
Future proof	Supports business strategy	Business wants to go into run a hydrogen

network in the future and this would support this

With forecast benefits to be delivered:

- To understand, globally, how others are coping with internal and external perceptions of the energy transition.

- To understand, globally, what methodologies have been used within other companies who are either going through the energy transition themselves or are undertaking change on the same scale.

- Be able to make decisions based on the recommendations and lessons learnt from the technical report produced

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

The method will be completely replicable, as it is reviewing previous evidence already published or in common knowledge and asking stakeholders for common experiences. In further phases we could hopefully use these findings to set out adopting a recommended methodology to help people adapt to the energy transition

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

This project will focus on the options for behaviour change tools and the common behaviour blockers seen within networks and not looking at costs for rolling this out (which may be done in later phases, potentially following a successful smaller trial).

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 learnings of this project may be able to be put into further projects in the future to enable National Gas to have employees ready and accepting of the change from natural gas to hydrogen and other gases of the future.

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.

The project proposal has been shared with the gas industry to avoid duplication. There will be no duplication of activities done as part of this program. This project will address a gap in National Gas' ongoing innovation work looking at hydrogen transportation and enabling work to support the energy transition.

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 project will be looking at a variety of novel behavioural techniques applied across the globe for companies that have undergone large-scale change within their organisations and will enable us to see how this could be used in an original way for the gas industry (primarily National Gas). It will be the first project of its kind in National Gas. It will also be looking at starting to answer the questions surrounding external stakeholders (which hasn't been done) as listed in the HSE safety considerations (D21-26).

Relevant Foreground IPR

This project will not result in any new Foreground IPR as this is a research study looking at methods which already exist and gathering data.

Data Access Details

Details on how network or consumption data arising in the course of an NIA funded project can be requested by interested parties, and the terms on which such data will be made available by National Gas can be found in our publicly available "Data sharing policy relating to NIA projects" at www.nationalgas.com/gasinnovation. National Gas data access is managed IAW provisions under 2.15-2.18 for the current NIA Governance Document.

National Gas already publishes much of the data arising from our NIA projects at www.smarternetworks.org. You may wish to check this website before making an application under this policy, in case the data which you are seeking has already been published.

Data Quality Statement (DQS):

The project will be delivered under the NIA framework in line with the agreed Energy Networks Innovation Process document NGT internal policies. Data produced as part of this project will be subject to quality assurance to ensure that the information produced with each deliverable is accurate to the best of our knowledge and sources of information are appropriately documented. All deliverables and project outputs will be stored on our internal SharePoint platform ensuring backup and version management. Relevant project documentation and reports will also be made available on the ENA Smarter Networks Portal and dissemination material will be shared with the relevant stakeholders.

Measurement Quality Statement (MQS):

The methodology used in this project will be subject to our supplier's own ISO 9001 certified quality assurance regime and the source of data, measurement process and equipment as well as data processing will be clearly documented and verifiable. The measurements, designs and economic assessments will also be clearly documented in the relevant deliverables and final project report and made available for review.

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

National Gas Transmission are not funded for Hydrogen behaviour related projects through business as usual funding, and so this project must be funded through the Network Innovation Allowance.

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

Funding this project through NIA gives and opportunity to share the findings with other network licensees to enable their own progression of hydrogen transportation related activities.

This project has been approved by a senior member of staff

☑ Yes