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

Jan 2023

Project Reference Number

NIA2_NGESO039

Project Registration

Project Title

Future of the Transmission Network Charging Methodology

Project Reference Number

NIA2_NGESO039

Project Licensee(s)

National Energy System Operator

Project Start

January 2023

Project Duration

0 years and 3 months

Nominated Project Contact(s)

James Stone; Nicola White

Project Budget

£500,000.00

Summary

Transmission Network Use of System charges recover the annual cost of provision, maintenance, and upgrade of the electricity transmission system, levied on generators (c.£800m) and demand users (c.£2.7bn). Stakeholders have expressed concerns about these charges, in terms of cost reflectivity and unpredictability. This uncertainty is considered to hamper investment (renewables and emerging technologies), specifically in the context of the changing energy landscape and achieving decarbonisation goals in GB.

This project will explore the feasibility and impacts of future options for change to the transmission network charging methodology, so it sends meaningful long-term signals. This will allow users to make future investment decisions, to improve security of supply and facilitate the transition to Net Zero with benefits to consumers, local communities, and the environment.

Third Party Collaborators

Frontier Economics

Nominated Contact Email Address(es)

box.so.innovation@nationalgrid.com

Problem Being Solved

Industry (energy suppliers and generators including conventional & renewables) have raised concerns that the transmission network methodology may not be fit for purpose, is complicated and leads to volatility in charges, which some parties find difficult to manage

and which impacts competition in the electricity market and ultimately value for end consumers.

The energy system landscape has evolved significantly since the network charging methodology was last reviewed (some 10 years ago) and looks to continue to diversify further i.e., a move away from dispatchable conventional generation plant (such as coal) to more intermittent weather driven generation (renewables). In addition, the material deployment of diverse electricity storage and significant changes to the nature of demand (demand side flexibility and uptake of Electric Vehicles) means there is a significant challenge in terms of the methodology for transmission network charging.

Transmission network charges are also, for many, unpredictable and for some parties this uncertainty is considered to hamper investment (particularly with emerging technologies and renewables deployment), specifically in the context of the changing energy landscape and the transition required to achieve Net Zero decarbonisation goals in GB.

This project will take a first step towards identifying and providing options and recommendations to address these issues faced by industry.

Method(s)

This project will be delivered using a multiphase approach and will involve conceptual assessment, solution identification (design at both a high and detailed level necessary to allow a meaningful conceptual and quantitative analysis to be undertaken), and assessment of a range of potential reforms and implications of reform (likely to include aspects of qualitative (conceptual) and quantitative analysis). The collective outputs of the extensive modelling will allow industry to infer the direction and broad magnitude of the impact of different charging reforms on the absolute levels and relativities of charges, as well as their stability.

The production of recommendations from this project will feed into a wider collaborative industry project looking at changes to transmission network charging, the Transmission Network Use of Systems Charges Task Force.

The project itself will be broken down into 4 key workstreams:

Workstream 1 - Planning: development and delivery of a workplan for shortlisted areas for investigation and high-level analysis scope agreed.

Workstream 2 - Analytical Assessment: delivery of analytical assessment and conceptual assessment of shortlisted areas. Assessment will cover the solution identification/design; quantitative analysis and testing of alternate solutions; analysis to support assessment of solutions/recommendations (implications & impacts); analysis findings, options/draft recommendations and emerging conclusions to be provided to the ESO and wider industry.

Workstream 3 - Industry Engagement: outputs, including solution options and recommendations to be presented to the industry Task Force and wider industry via a series of workshops, as well as industry webinars.

Workstream 4 - Recommendation Report: summary reports delivered for each workstream will then feed into and support the wider industry Task Force in their production of a final recommendation report to be submitted to Ofgem, with content agreed for publication.

Risk Assessment:
In line with the ENA's ENIP document, the risk rating is scored Low.
TRL Steps = 1 (TRL change 1)
Cost = 1 (£500k)
Suppliers = 1 (1 Supplier)
Data Assumptions = 1

Scope

The scope of this project is to undertake research and carry out modelling to explore the feasibility and impacts of future options for change to the transmission network charging methodology, specifically in relation to cost reflectivity and predictability of the locational signals required by network users to make future long-term investment decisions with the aim of supporting least cost decarbonisation in GB.

Objective(s)

1. To assess options for reforms (via the use of qualitative and quantitative analysis) to the transmission network charging methodology.
2. Deliver a recommendation report outlining potential solutions (and associated implications & impacts), which will feed into a

wider collaborative industry project looking at future changes to transmission network charging arrangements.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

National Grid ESO does not have a direct relationship to end consumers, and therefore is unable to differentiate the impact on consumers and specifically those in vulnerable situations. However, benefits to all consumers are detailed further below.

This project has been assessed as having a neutral impact on customers in vulnerable situations because it is a transmission project.

Success Criteria

This project will be considered a success via the delivery of analysis and a recommendation report detailing potential solutions for reform to transmission network charging arrangements, to inform and further develop changes with wider industry via the Task Force.

Project Partners and External Funding

Frontier Economics, no external funding contribution.

Potential for New Learning

The analysis output and a summary report, including solutions options and recommendation for change will be produced. A presentation of outputs and emerging conclusions will be provided to both internal ESO stakeholders as well as wider industry via webinars at the mid-point and project end.

All the above will subsequently be published in a report on the ENA Smarter Networks Portal.

Scale of Project

This project will span three months with Frontier Economics delivering the work.

This is a research and analysis project and will explore potential solutions for changes to the transmission network charging methodology to aid the transition to a decarbonised future energy landscape.

Technology Readiness at Start

TRL2 Invention and Research

Technology Readiness at End

TRL3 Proof of Concept

Geographical Area

This project will cover the whole of the GB electricity transmission network.

Revenue Allowed for the RIIO Settlement

None

Indicative Total NIA Project Expenditure

£500,000

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:

This project will investigate and put forward options for change to ensure the charging methodology is reflective of the current and emerging energy landscape. Identifying options to improve cost reflectivity, predictability and ensuring the methodology sends meaningful long-term signals will allow network users to make future investment decisions (both relating to emerging technology-based projects (such as storage) but also critical projects such as the Holistic Network Design (HND) which considers future generation out to 2030). This will ultimately improve security of supply and support the transition to Net Zero and the achievement of GB decarbonisation goals.

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

Not required as this is a research project.

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

This will be the output of the project. The scope of the project and associated solutions to the problem will cover the whole of the GB electricity transmission system.

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

At this stage we are unable to provide costs at point of project registration. This is because costs cannot be estimated as the project outcome is unknown and will be exploring options, therefore the ultimate cost of any rollout will be dependent on the final solution chosen.

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

This project is the first step in identifying potential alternate solutions (including providing implications and impacts of changes) in relation to the design of the future charging methodology. The results of the analysis will support assessment of any solutions and recommendations which can then be taken forward and developed further by wider industry. All output and learnings of the research will be shared with the wider industry. Updates for wider industry visibility will be published through existing channels including Transmission Charging Methodologies Forum (TCMF) and Charging Futures TNUoS Task Force - Resources Page.

All the above will subsequently be published in a report on the ENAs Smarter Networks Portal.

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.

We consider that this project is the first piece of work of this kind for over ten years and as such there should be no direct 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

This is the first piece of work of this kind for over ten years and focuses on the methodology required for both the current and likely future energy system. The energy system landscape has evolved significantly over this period (and continues to diversify further) i.e., a move from conventional generation (such as coal) to renewables. In addition, the material deployment of diverse electricity storage and significant changes to the nature of demand (demand side flexibility and uptake of Electric Vehicles) means there is a significant

challenge in terms of the future charging methodology. As such, there is inevitably a significant amount of uncertainty in terms of the potential solutions to address the problems raised by the industry, but also relating to the outcomes of the project itself (which will ultimately support the case for wider industry change).

Relevant Foreground IPR

The following foreground IPR will be generated in the course of the project:

- A recommendation report outlining potential solutions (and associated implications & impacts), which will feed into a wider collaborative industry project looking at future changes to transmission network charging arrangements.

Data Access Details

Data for this project and all other projects funded under the Network Innovation Allowance (NIA), Network Innovation Competition (NIC) or the new Strategic Innovation Fund (SIF) can be found or requested in a number of ways:

1. A request for information via the Smarter Networks Portal at https://smarter.energynetworks.org, to contact select a project and click 'Contact Lead Network'. National Grid ESO already publishes much of the data arising from our innovation projects here so you may wish to check this website before making an application.
2. Via our Innovation website at https://www.nationalgrideso.com/future-energy/innovation
3. Via our managed mailbox innovation@nationalgrideso.com

Details on the terms on which such data will be made available by National Grid ESO can be found in our publicly available "Data sharing policy relating to NIC/NIA projects" at https://www.nationalgrideso.com/document/168191/download.

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

This is a highly complex project with many variables, and we do not consider that we have the current resource and expertise to deliver the necessary level of research and modelling that will be required to deliver a high-quality result for this problem. In addition, given the uncertainty around potential solutions there is also a chance that the results may be inconclusive and no further opportunities for change are identified.

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 project will develop and assess charging design options, as such without fully researching and assessing those options and the implications, there is a risk of developing potentially inefficient signals particularly in the context of the significant amount of investment required to facilitate Net Zero and meet decarbonisation goals.

This project has been approved by a senior member of staff

☑ Yes