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 2024

Project Reference Number

NIA2_NGET0081

Project Registration

Project Title

AssetCool

Project Reference Number

NIA2_NGET0081

Project Licensee(s)

National Grid Electricity Transmission

Project Start

May 2025

Project Duration

1 year and 1 month

Nominated Project Contact(s)

Ibukunolu Oladunjoye

Project Budget

£585,000.00

Summary

Project AssetCool seeks to evaluate the coating technology from Rascol. The coating increases the capacity of existing conductors by 15-20%. The evaluation will be conducted at a test centre at specific times in summer and winter. The tests will be carried out on both used and new conductors. Results from the test will provide information on static line rating and asset management practices. The expected benefits will be in optimization of assets with possible cost savings.

Third Party Collaborators

AssetCool

Nominated Contact Email Address(es)

box.NG.ETInnovation@nationalgrid.com

Problem Being Solved

National Grid Electricity Transmission (NGET) owns over 10,000 km of conductors in England and Wales. In the UK, annual electricity demand is forecast to increase over 100% before 2050 (ESO Future Energy Scenarios, 2024). The long-term solutions include reconducting and building new lines. Currently, expanding the transmission capacity is a capital-intensive process, requiring significant resources, planning timelines, planning approvals and right of way agreements. The average time to construct an overhead transmission line is 10 years in Europe and North America i.e., 7 years planning, and 3 years construction (IEA, 2023). No solution is available to increase overhead transmission and distribution conductor capacity rapidly and inexpensively.

Project AssetCool will validate conductor performance based on Rascol conductor coating. With success, AssetCool may be a solution to provide low cost and rapid uprating of transmission assets.

Method(s)

This project aims to validate the conductor ampacity improvement of the Rascol coating technology. High voltage testing will be deployed to assess the performance of both used and new coated conductors. Data collection methods will enable analysis of the results under different weather conditions. With success, conductor coating technology may be deployed in areas of constraint as a quick and inexpensive solution.

Scope

The scope of the project entails stringing up used and new conductors on a gantry for HV testing. Prior to the tests, the conductors will be coated with Rascol coating technology and the application of the coating will be carried out using a line robot. Thermocouples and remote sensing devices will be employed for monitoring and measurement. Both coated and uncoated conductors will be tested over two seasons, summer, and winter. Data captured will be used to evaluate the performance of the coating with respect to ampacity improvement of the conductors.

Key deliverables for the project are:

- Technology awareness which includes Rascol's coating technology and line robot.
- Coating execution for used and new conductors as well as sensor installation.
- Data collection using thermocouple and remote sensing.
- Techno-economic analysis of the results.

NIA Compliant Completion and Progress Report.

Objective(s)

The objectives of the project are:

- To evaluate the ampacity performance of Rascol coating technology for used and new conductors.
- To assess the line robot coating application procedure and practicality.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

The project output will enhance the asset management practice by providing more detailed analysis and information on conductor coating technology. This may provide an alternative to constraint management and deferred capital expenditure. There will be cost savings due to the relatively inexpensive coating alternative as opposed to capital intensive reconducting or rebuilding.

The project will have a positive impact as consumers will benefit from savings made from deferred capital expenditure and from a more robust constraint management system.

Success Criteria

The Project will be successful, if:

- The conductor ampacity improves because of the coating in an approximate range of 15-20%

Project Partners and External Funding

AssetCool

Potential for New Learning

In this project, the expected learnings include:

- The coating execution via the line robot and the sensor installation.
- The ampacity improvement of the used and new conductors from the application of Rascol coating technology.

Scale of Project

The scale of this project involves the following:

- Coating of conductors using a line robot.

- Testing of coated and uncoated conductors in summer and winter.
- Data collection and processing.
- Presentation and documentation

Technology Readiness at Start

TRL5 Pilot Scale

Technology Readiness at End

TRL8 Active Commissioning

Geographical Area

The project will be carried out at Deeside Centre for Innovation.

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

£526,500

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 aim of the project is to uprate assets capacity rapidly and inexpensively. Coating technology will allow for a more robust management of network constraint. Substantial savings can be realised through constraint management, which can save costs for NESO and therefore consumers. Cunsumers will benefit from the savings that this conductor coating technology provides.

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

The benefit will be achieved through deferred works / construction of new lines. AssetCool conductor coating can improve conductor capacity by 15-20 %. In an 8 years period, the estimated saving will be over £ 5 million dependent on tower span and if the construction of new lines would provide a similar 20% uprating.

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

National Grid has over 10,000 km of conductors in England and Wales and the coating technology can be applied on the network with some adjustments to the dimensions of the line robot.

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

The costs of deploying the new method should be relatively less costly when compared to building new lines. It has been estimated that it will cost £ 15,000 to coat a km of conductor (15,000/ckm).

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 learning that will be generated from this project can be used thus:

· The performance of the Rascol's coating technology will provide relevant data as to its use case as an alternative in constraint management and in deferring construction work.

· Data gathering methods of using thermocouple sensors and remote sensing will provide information on the efficiency and efficacy of both methods.

The line robot operation and coating application procedure will inform stakeholders of the practicality and effectiveness of the method.

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 are aware SSEN-T are trialing a conductor coating with AssetCool for the intention of conductor noise reduction. We intend to test a different conductor coating from AssetCool and we are specifically focused on the potential to increase conductor capacity which is not being trialed through another network innovation project. We will work with SSEN-T and share and learn from the outcomes of these two projects projects.

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

AssetCool offers a rapid and inexpensive solution to uprating conductors using a coating which is very different from the industry

method of reconducting and building new lines.

Relevant Foreground IPR

The following Foreground IPR will be generated by this project:

· Ampacity results from tests conducted at the test centre.

· Performance evaluation of NGET coated vs uncoated conductors.

Rascol's coating technology is relevant Background IPR.

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:

· 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 already publishes much of the data arising from our innovation projects here so you may wish to check this website before making an application.

· Via our Innovation website at https://www.nationalgrid.com/uk/electricity-transmission/innovation

· Via our managed mailbox box.NG.ETInnovation@nationalgrid.com

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

The project has some risk associated with the use of the coating technology. Challenges include the efficiency and efficacy of the coating application and its practicality. In addition, the intrinsic value of the coating is in deflecting solar radiation and the UK has less sunshine than some other parts of the world. Hence, the effectiveness of the coating application in UK climate is unpredictable.

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 effectiveness of the coating application in UK climate is unpredictable, this risk makes AssetCool a good fit as an innovation project.

This project has been approved by a senior member of staff

☑ Yes