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

Feb 2024

Project Reference Number

NIA2_NGET0054

Project Registration

Project Title

Electricity Transmission Heat Effects, Resilience Measures to Manage Asset Lifecycles (THERMAL)

Project Reference Number

NIA2_NGET0054

Project Licensee(s)

National Grid Electricity Transmission

Project Start

March 2024

Project Duration

1 year and 7 months

Nominated Project Contact(s)

Tinashe E Chikohora

Project Budget

£1,670,000.00

Summary

This project aims to provide a means (tool structure) to forecast the impact of temperature events on asset behaviour and the implications for overall network performance, risk and resilience. Currently, the absolute strain that extreme heat or rapid temperature changes poses on critical infrastructure is not entirely known. Yet, we expect more multi-faced weather events such as severe heat and cold waves with undulating characteristics which pose a threat to normal operation of electrical components especially within aged equipment. Currently, no method exists to explicitly outline how service delivery is affected, neither is there any matrix to fully assemble resilience against multi-hazards weather extremes. This project will inform NGET's and SSEN-T's related RIIO investment planning, in-year planning and improve real time network decision making.

Third Party Collaborators

TNEI Services Ltd

University of Edinburgh

Frazer-Nash Consultancy

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Problem Being Solved

The electricity high voltage (HV) network represents a complex and diverse system of spatially distributed assets that will only grow in complexity with the pursuit of Net Zero through electrification. Failures and performance issues can be influenced by extreme temperature events manifesting as absolute temperature, temperature changes or temperature transients.
At one time, Denver city experienced 65oC step change when temperature swinged from a high of 50oC to -15oC in just less than 16

hours. Global warming is expected to increase the prevalence and severity of these events, reducing network reliability and increasing the likelihood of failures.

The parameters that influence thermal behaviour of a spatially distributed asset network under extreme temperatures are complex to understand and control. At present there is no clearly defined, tested and validated approach to gain a comprehensive understanding of how these temperature events can influence failure modes and overall performance of various HV assets.

Some intentional coordinated approach is necessary to optimise assets output and equipment operations in substations to support clean energy delivery more so under specific extreme heat or rapid temperature swing situations. At the same time, weather related hazards are often assessed in isolation with little understanding on the complexities of how different hazards interact with each other and over what period an individual risk may leave electricity networks vulnerable to other hazards. The problem of multi-hazard weather events happening within the same location and time must be critically analysed to manage probability of cascade failures which are a growing concern as one of the main mechanisms causing widespread blackouts of power networks. Although each of these incidents considered in isolation would not have caused concern, their aggregate effects and cumulative impact can be catastrophic.

Method(s)

The technical methods that will be used to address the problem outlined in Section 2.1 are centred around predictive modelling approaches.
Global warming is increasing the prevalence of extreme temperature events; however, the extent, severity and durations of such events are not yet known. A probabilistic approach centred around historic data and projected future trends will be developed to postulate future extreme temperature scenarios. The performance of individual assets can be influenced by such extreme temperature events, with both absolute temperature and temperature transients having an influence on asset behaviour, asset performance, and asset aging. The system as a whole is inherently impacted by such events, with static, dynamic and cyclic line ratings requiring detailed evaluation to ensure an appropriate approach going forward.

The long-term impacts of such events, and how they may influence failure modes of assets, will be considered through in-depth research into asset performance and degradation mechanisms. The degradation and potential failure of individual assets will have an adverse impact to the performance of the overall system; therefore, the criticality of individual assets can be considered as part of a risk-based evaluation of the wider networks and system as a whole.

Specific focus will be given to HV overhead line (OHL) and transformers in open substations, which are known to be exposed and therefore susceptible to extreme temperatures. A combination of engineering simulations, physical models and data science will provide a probabilistic approach to asset aging and degradation.

Whilst there has been modelling development to quantify component (mainly Lines and Cables) ageing due to temporary heating (from loading mainly), the analyses do not extend to rapid weather changes with simultaneous loading fluctuations.

The models underpinning this project will use a combination of engineering simulation, climate data, physical models and data science to provide a probabilistic output which quantifies uncertainty and thereby enables rigorous risk-based decision making.

Scope

To address the problem outlined in Section 2.1, a programme of four complementary projects has been developed. This programme will be delivered through a consortium of consultancies and academic institutions, bringing together industry leading knowledge, market leading modelling and analysis expertise and dedicated HV testing facilities. The consortium brings together organisations that are well known in the industry with pre-existing ties to relevant DNOs TNOs, and manufacturers. The four core projects are described below:

Climate resilience planning for multi-hazard extreme weather events, and singularly extreme heat/cold and associated rapid temperature shifts.
Project scope

- Identify key use cases, including relevant aspects of weather, and how system consequences can be quantified either in the form of cost or in terms of engineering standards, or specification of required technical performance.
- Develop understanding on required decisions or justifications associated with the project use cases.
- Confirm appropriate datasets for use, including spatial/temporal resolution, and the appropriate balance (as part of the use cases) between use of historic and climate model data.
- Review relevant industrial and research literature, and liaise with industry connections e.g., UK/non-UK networks, National Grid (US) etc. on energy industry best practices.

- Study the risk in future climate associated with at least one of the use cases, and how the risk changes from present day, to ensure the climate analysis is linked to network decision making.
- Develop detailed for analysis of the other two use cases, and for the application to supporting decision making

Project benefits

- Improved planning for asset resilience, balancing reliability and cost for the benefit of customers.
- Case studies and protocols for application of general methods and datasets in climate science/resilience to energy network use cases.

Predictive modelling of high voltage assets under extreme temperatures

Project scope

- To undertake a holistic review of HV network assets, categorising the performance impacts of extreme temperature events on HV asset types and documenting existing approaches / tools used to manage assets under such events.
- To develop a comprehensive HV network taxonomy, mapping known failure modes and degradation mechanisms associated with extreme temperatures against defined asset categories, thus enabling the quick identification of commonalities across a complex spatially distributed network of assets.
- The project will capture cross-discipline learning and experience through target stakeholder engagement with subject matter experts (SME) representing resilience teams, asset managers, operations, condition monitoring and network engineers.
- Creation of a rich data set, capturing both quantitative and qualitative information sourced from existing data sources, stakeholder interviews and the data outputs from other parallel projects.
- Identification of asset categories that present a risk to future network resilience under extreme temperature events, allowing a prioritisation and scoping of future modelling efforts.

Project benefits

- Provides a structured framework that allows extreme temperature scenario planning to be undertaken on a high volume of spatially distributed network assets.
- Provides an evidence-based approach for identifying and prioritising network assets that should be the subject of more detailed analysis, monitoring or modelling activities.

Reassessing weather driven capacity limits through improved thermal models of individual network components and integrated framework for evaluation at substation, network and whole-system levels.

Project scope

- Reassess existing methodologies and practices for determining static, dynamic and cyclic thermal ratings (STRs, DTRs and CTRs) of UK network components and formulate suitable improvements of their operational thermal models in the context of ongoing climate change and extreme heat events (e.g., include impact of solar irradiance and wind speed on loading limits of transformers in open substations).
- Validate and finely tune developed thermal models of different types of network components through targeted field-based measurement campaign (individual asset and substation level measurements).
- Integrate thermal models and assessed loading limits of individual network components into the analysis of the overall substation/network/system capacity limits. Such integrated methodologies are currently missing and are particularly important for evaluating conditions for the connection of much higher numbers of PV and wind generation systems, as well as increased demand from new electric vehicle and heat pump loads.
- Formulate final models, which should be derived for specific components using only basic or standard manufacturer specification. Include in the modelling approach evaluation of ageing on components' loading limits during the lifetime and consider improvements of empirical-based ageing models (e.g., impact on components' failure rates).
- Integrate models into the toolset for asset health monitoring and forecasting: operational for optimal event-response measures, and planning for cost-effective investment decisions.

Project benefits

- The improved thermal models of network assets and their integration in the methodologies and tools for the assessment at substation, network and whole-system levels will have following benefits:
- To transmission and distribution system operators/owners and generating plant developers/operators: Increased system utilisation and efficiency, release of hidden/spare system capacity for the connection of both new generation and new load, deferred investment in system upgrading and system expansion, prevention of generation curtailment due to limited system capacity, improved operational performance, system resiliency and emergency response.
- To energy suppliers, aggregators and customers: Provision of efficient, affordable and secure power supply, offering higher system capacities for energy exchanges on the market, opening new opportunities for realising more flexible energy balancing and demand-side management services, as well as supporting electrification of road transportation and heating and cost-effective Net Zero transition.

Quantifying and incorporating impact of equipment thermal stresses on network reliability by designing and testing resilience analysis framework (system level) and carry out informed experimentation on overhead conductors (asset level)

Project Scope

- Conduct a comprehensive review of the impact of extreme heat on Overhead Line (OHL) assets and summarize the existing approaches employed by network operators to manage these assets during such events.
- Perform a detailed review of ageing and life prediction models currently in use for OHLs.
- Perform modelling and experiments on specific OHL conductor to assess the thermal effects on OHLs, considering both thermal stresses during extreme temperature conditions.
- Assessment and modelling of the aging risks faced by OHL conductors under extreme temperatures.
- Evaluate the vulnerability of OHL conductors by using analytical methods to produce fragility curves that reflect the asset failure probability under extreme heat conditions.
- Fragility-dependent resilience analysis: resilience analysis considering the produced fragility curves capturing both network and asset resilience.

Project benefits

- Provide a detailed resilience framework that assess the impact of extreme heat temperatures on OHL conductor asset under various extreme events scenarios for improved decision making.
- Optimised maintenance and longevity by understanding the ageing risks under extreme temperature scenarios.

The outputs from these four projects will be captured within a common toolset, providing NGET with an interactive web-based solution to support their understanding and evaluation of future extreme temperature events. The project's specific use-cases will be refined through project delivery, where outputs can be tailored for real-time decision-making, short to medium term forecast support to aid asset management and maintenance, and longer-term network investment planning decisions associated with reinforcement and resilience.

Objective(s)

- This project aims to provide a means to forecast the impact of temperature events on asset behaviour and the implications for overall network performance, risk, and resilience. The ultimate objective of this work is to provide NGET with a better understanding of how future extreme temperatures events can impact the behaviour and performance of both individual assets, and the system as a whole. To achieve this objective the project will:

- Develop a probabilistic modelling approach to predict the prevalence of future extreme temperature events and rapid temperature shifts that have the potential to have an adverse effect on network assets and system behaviour.
- Provide a common extreme temperature weather dataset that can be used by supporting programmes to consider bounding conditions for asset degradation and failure modes.
- Review and consolidate existing studies evidence base into temperature impact on assets.
- Categorisation and catalogue network assets within a taxonomic structure to support the down selection and prioritisation of assets that will require greater evaluation.
- Undertake an evaluation of existing methodologies and approaches for determining the static, dynamic and cyclic thermal ratings (STR, DTR & CTR) of UK network components, and identify potential improvements of their operational thermal models.
- Validate and finely tune developed thermal models of different types of network components through targeted field-based measurement campaign.
- Integrate thermal models and assessed loading limits of individual network components into the analysis of the overall capacity limits at substation level, local network level, and system level.
- Experimental/modelling approach to understand thermal stresses of overhead line conductor under extreme temperature conditions and combine these findings within existing engineer models and data science approaches to provide a risk-based evaluation of OHL conductor asset.
- Provide a resilience framework that assess the impact of extreme heat temperatures on OHL conductor asset under various extreme temperature scenarios.
- Presentation of study findings within a web-based toolset acting as a framework that can be built upon, integrated to existing platforms, or added to in subsequent projects.

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 an overall positive impact on consumers in vulnerable situations. The assessment has identified that this project will look to enhance network resilience, least cost decision making, transmission capability and operability that will ultimately reduce exposure costs for households.

Success Criteria

Programme success will be contingent on:

- The development of an OHL model to support expected ageing and life expectancy projections
- A generic model framework for all HV network assets allowing a flexible simulation approach such as:
  - Extraction of multiple quantities of interest (high and low temperatures, rates of change across different window lengths)
  - Specify level of extreme (1 in 10-year event etc)
  - Could test 'what if' worst case scenarios
- Values modelled for a range of different equipment
  - Failure probabilities
  - Identify most resilient technologies and practices
- Probabilistic assessment
  - Quantifies the risk – identify components most at risk, evaluate expected costs of maintenance strategies etc

Project Partners and External Funding

NGET are partnering with SSEN-T on this project, but the full project costs will be borne by NGET.

Potential for New Learning

Regardless of the selected use case, a key feature of the tool would be predicting remaining asset life and time to failure based on the environmental and/or operational conditions it has been subjected to and is expected to experience in the future. This would enable informed decisions and provide the evidence to justify any required changes to design standards or maintenance plans.

The probabilistic and physics-based nature of the model (as opposed to a purely data-led approach) will enable informed insights into which feature of the environmental and operational conditions and component/asset specifications are driving any reduced asset lifespan or increased risk of failure, ad to what extent each feature is contributing. This will enable enhanced targeting of future work to mitigate the temperature effects.

Well-documented experimental thermal models evaluations are rare and sharing these results will be of significant benefits for wider engineering and scientific communities.

Scale of Project

The extreme weather events, including heatwaves, cause severe problems for the UK electricity networks and require new weather baselines to be established by extrapolating outside the normal ranges of weather parameters. New analytical tools and improved models for assessing impact of higher temperatures are required, particularly in terms of the reduced loading limits of network components and a supply system as a whole.

The combined uncertainty associated with future weather, unknown rate of asset degradation across a range of asset types and ages, and an unknown growth of demand on the network make this a complex and challenging task. To address this, the project has mobilised a multidisciplinary programme team, of four project partners, who will collaborate and contribute towards the creation of common toolset and approach to this challenge. This collaborative approach will capitalise on the discipline specific expertise of each partner and contribute to a combined output that is greater than the sum of the individual parts.

Technology Readiness at Start

TRL3 Proof of Concept

Technology Readiness at End

TRL6 Large Scale

Geographical Area

National Grid will provide access to selected substations for project activities. NGET's Deeside Centre for Innovation (DCI) or the University of Manchester will serve to meet any required testing. SSEN-T will avail different conductor types and samples for tests and experimentation.

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

£1,470,000.00

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 provides a benefit to the electricity network, the consumer, and GB's energy transition by:
a. Better utilisation of existing assets
b. Increasing understanding of heat waves, temperature fluctuations
c. Reduced costs of energy (potential to extend existing useful life of assets
d. Informed decision making for existing and future network

Over the recent years the project partners have developed improved thermal models of OHLs, cables and transformers, which take into account all weather conditions and therefore allow for a more accurate assessment of components' loading limits. Developed models are validated (with non-UK manufacturers and system operators) and are now ready for the implementation in the UK-based network studies, allowing to integrate limits for individual components into a network/system-level analysis. The validation of models using the measurements in the selected UK substations will also allow to include evaluation of ageing on components' loading limit and improvement of the current empirical-based component models, particularly in the context of climate change, severe weather and extreme heat events that are recently experienced in the UK.

Met Office has reported that the top 10 warmest years in the UK from 1884 have occurred since 2002, clearly indicating an emerging pattern of higher temperatures due to climate change. These high temperatures ("heatwaves") resulted in more frequent and intense storms, rainfalls and floods, which were amongst the most severe in the last 50 years. The extreme weather events, including heatwaves, cause severe problems for the UK electricity networks and require new weather baselines to be established by extrapolating outside the normal ranges of weather parameters. New analytical tools and improved models for assessing impact of higher temperatures are required, particularly in terms of the reduced loading limits of network components and a supply system as a whole.

The ongoing climate change necessitates reassessment of existing methods and practices for evaluating impact of weather conditions, but it also opens opportunities for a more efficient utilisation of existing system assets (operational stage) and more confident decision-making for system upgrading and expansion (planning stage).

Accordingly, this project partial assignment is to establish an integrated framework for evaluating weather-driven changes in loading limits of specific network components ("assets") and then available capacities at substation, network and whole system levels (the asset is the system).

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

The benefits of this project accrue to the entire customer base connected to NGET's network, and those of any other collaborating partners – both in the shorter run though a resilient network being planned with improved efficiency, and in the longer run due to the network having been planned against classes of extreme events that may be more prevalent in the future.

The project will ensure higher levels of system utilisation and resiliency, providing more efficient, reliable, affordable and secure power supply to customers, allowing for the connection of new loads and realisation of new energy balancing and demand-side management services on the electricity market.

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 as TRL 3 project at start

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

This project is potentially applicable to all TNOs, DNOs and National Grid ESO since it will enable a significantly more reliable forecast of future failures within a network and understanding of the wider energy system impacts. To put this into context, them transmission network consists of approximately 4,500 miles of overhead line, over 900 miles of underground cable and over 300 substations. This increases significantly when considering the regions of distribution networks that could benefit where they
interface with transmission. As part of this project, we will identify the highest priority areas to target and the stakeholder groups that will benefit the most.

The work in and outputs of the proposed project will primarily have impact on transmission and distribution system operators, but also on power system equipment manufacturers, generators and energy suppliers/aggregators, for which benefits and market related values will vary, based on the actual impact of more accurately assessed or additionally available loading limits of network components and whole system, and further positive impact that these will have on improved system efficiency and utilisation, deferred investments, improved connection conditions, etc.

The target market for this proposal is likely utilities companies or other organizations involved in the management and maintenance of high voltage power equipment. It may also be of interest to companies involved in weather forecasting or climate change research.
This proposal also assures more affordable, reliable, and resilient power supplies under extreme weather conditions to millions of customers.

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

The estimated costs of rolling out the method across GB will be reviewed during project delivery after the research effort has progressed.

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

There is a lot of previous work on assessment of loading limits of specific network components (e.g., overhead lines, OHLs, and transformers), but no work exists on integrating loading limits of different components for the analysis on a substation, network and system levels. Furthermore, thermal models of different components cannot be directly compared (e.g., current limits for OHLs vs power limits for transformers), and thermal models of transformers include only ambient temperature, while solar irradiance and wind speed are neglected, although they have strong impact on naturally cooled transformers (ONAN types) in open substations.

The developed improved analytical and empirical thermal models and corresponding integrated framework will be implemented as a practical web-based toolset/application and used for the system performance evaluation, operational studies and investment planning, as required or suitable by related stakeholders.

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.

This proposed effort by the project consortium is novel and is revealing resilience centred fundamentals that are relatively new extreme heat resilience space within a different yet still changing climate.

Pursuing each project scope individually would have the potential for duplication; however, this risk has been mitigated through the formation of a collaborative and complementary programme team who can share expertise and align approaches so that duplication is avoided, and project outputs are compatible.

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 output will be a proof-of-concept predictive model of a HV network that will enable electricity network operators to identify the assets most significantly at risk from extreme temperature (or extreme temperature fluctuations) to enable well-informed interventions which will minimise detrimental network impact as the network ages and is subject to greater electrification in the drive to Net Zero.

New and improved thermal models of network components will be developed and validated in a targeted measurement campaign in selected substations and then implemented in an integrated network/system level framework. Inclusion of aging and thermal stress in the models will allow to evaluate impact on failure rates and overall system reliability and resilience levels.

The concept can be delivered as an interactive web-based application yielding outputs that include recommendations for future work required to validate and upscale the project for implementation.

The project will provide data to facilitate decision making with improved understanding of the scientific basis for the data. Issues include need for calibration of data in context, higher resolution datasets providing limited coverage of the range of possible future climates, not all relevant aspects of future climate being reproduced well by climate models, and data on extremes inevitably being relatively sparse. There will be provision of weather/climate data, failure mode mapping, and decision support tools (as relevant to support NGET's detailed needs). This can be done on a range of scopes and scales, e.g., ultimately an enterprise-scale tool for allocating resource may be required, or in the shorter term substantial benefits are available from individual components of improved climate data and/or mapping of failure modes.

Relevant Foreground IPR

Foreground IPR will be created from the scope and objectives above. In particular;

- The collaborative development of improved analytical and empirical thermal models of network components, including aging effects and impact on their failure rates, may be subject to IPR regulation, as well as the integrated evaluation toolset for asset monitoring, event-responding, and decision-making.
- Any and all Results created or acquired or otherwise developed during the Project, shall, from the date of their creation, acquisition or development.
- Any results generated from the novel experimentation conducted, specifically focusing on the dependency of fragility curves on temperature as described in the aforementioned document must explicitly acknowledge UoM. This acknowledgement is required for inclusion in any publications or outputs arising from this experimentation.
- A developed THERMAL platform that will utilise data and relationship data, identified and generated through delivery of the four projects, to allow NGET to explore the effects of extreme thermal events.

The suppliers will contribute to the background IPR in terms of knowledge, knowhow, software and data relating to:

- The relevant background IP is already open and any output e.g., thermal models already developed are, or will be published in journals/conferences or already being exploited in other research projects e.g. CReDo.
- The ownership of any Background IP or any Intellectual Property in any other technology, design, work, invention, software, data, technique, know-how of experimental procedure and/or test rig design, or materials that are not Results.
- Intellectual Property Rights (IPR) pertaining to the conductor testing methods and tools employed in the experimentation fall outside the scope of this work, and as such, detailed information will not be disclosed in the project's outputs.
- Knowledge and Knowhow - Experience integrating data from a large number of data sources. Modelling capability, Development of APIs, User Interfaces, Web application frameworks. Comprehensive understanding of secure cloud storage and sensitive handling of customer data
- Software - National Data Platform – Internal software developed and used for visualising geospatial data.
- Software - 'Core' Cloud Platform: Prototype Automated Weather Alert Platform including user-interface and display of outputs.

NGET will contribute background IPR in the form of knowledge, knowhow and data relevant to its operation across the electricity transmission network in England and Wales.

The default IPR position will be applied to this project.

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 proposed solution is innovative in nature, with a component level of risk that is unsuitable to Business as Usual (BaU) implementation straightaway and thus BaU is not the appropriate funding mechanism for this project.

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 settles in to get support of NIA, in a fully controlled environment where there is no risk of causing network disruptions/outages while surveys and investigations could also be safely developed. Therefore, NIA, rather than BaU, is the appropriate funding mechanism for this project.

This project has been approved by a senior member of staff

☑ Yes