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

Oct 2025

Project Reference Number

NIA_UKPN0114

Project Registration

Project Title

Flex Forward

Project Reference Number

NIA_UKPN0114

Project Licensee(s)

UK Power Networks

Project Start

October 2025

Project Duration

0 years and 4 months

Nominated Project Contact(s)

Gemma White

Project Budget

£171,000.00

Summary

Flex Forward will identify, prioritise, and validate high-impact flexibility use cases beyond traditional congestion management. The project will provide robust evidence to accelerate low carbon connections, and guide fair investment decisions, ensuring UK Power Networks' flexibility services remain future proof and deliver maximum value for customers, stakeholders, and the wider energy system.

Nominated Contact Email Address(es)

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Problem Being Solved

Distribution-level flexibility is currently deployed primarily as a tool to manage congestion to defer reinforcement. There is value potential of flexibility beyond this to support distribution network management. The UK's energy system is rapidly evolving, with increased integration of distributed energy resources (DERs), electrification of heat and transport, and variable renewable generation, placing growing stress on local networks beyond just capacity constraints.

Voltage issues are becoming more prevalent, particularly at the low voltage level, due to the bidirectional and variable nature of DER output. Using flexibility to support voltage control and maintain power quality could be an efficient temporary measure while enduring solutions are applied.

Network resilience is increasingly critical, especially during abnormal operating conditions, outages, or extreme weather events. Flexibility could be a valuable tool to restore or maintain service levels, but its role in resilience is not yet well-defined or proven.

Current regulatory and commercial frameworks do not incentivise or support the procurement of flexibility for non-deferral-related services, creating a potential barrier to innovation and broader uptake.

These wider use cases remain underexplored, under-evidenced, and undervalued in investment and operational decisions. To unlock the full value of flexibility we must explore, develop and validate a credible framework to assess when and how flexibility can be the preferred solution in a range of system use cases. This will deliver the best system-wide value to customers possible, and help achieve the Clean Power 2030 target by providing more opportunities for small scale flexibility to take part.

Method(s)

This project will identify, quantify, and validate use cases for distribution-level flexibility, generating credible evidence and a roadmap to extend the value stack for flexibility providers, support fair and efficient investment decisions, and accelerate low-carbon technology (LCT) connections. Delivered through a sprint approach, the project will define and prioritise use cases, develop benefits logic, and undertake high-level quantitative assessments validated through structured stakeholder engagement.

Scope

The scope covers the identification of use cases, validation of their benefits, assessment of feasibility and attractiveness to flexibility service providers, and recommendations for pilots. Final outputs will provide robust evidence to enable fair investment decisions, accelerate LCT connections, and prepare UK Power Networks for future flexibility trials.

Sprint 1 – Prioritisation

Define and refine the use cases through workshops and stakeholder engagement. Develop a qualitative evaluation framework based on scoring criteria (e.g. materiality, timing, alignment with incentives, capability, flexible connections replacement) and shortlist priority use cases for detailed assessment.

Sprint 2 – Use Case Evaluations I

Develop benefits logic and conduct high-level quantitative assessment of shortlisted use cases supported by data held by the DSO team. Assess value, feasibility, and attractiveness to flexibility service providers (e.g., revenue predictability, notice periods, activation frequency). Validate findings through stakeholder review.

Sprint 3 – Use Case Evaluations II

Continue detailed evaluation of priority use cases, consolidating outputs into a draft report. Stakeholders review early quantifications and provide feedback. Note: product design is excluded, but findings will include commentary on operational considerations relevant to design.

Sprint 4 – Final Reporting & Recommendations

Finalise a report with conclusions. Recommend priority use cases for progression to pilots, including enabling actions and an outline trial plan.

Project change: The project end date was extended to 31 March, 2026. This change was made to ensure that the project results were validated in detail by key stakeholders, with suggested future trials considered and assessed for suitability as subsequent pilots.

Extending the project by two months enables successful delivery of the benefit assessment for the prioritised flexibility use cases. There was no impact on budget.

Objective(s)

The project will quantify, validate, and prioritise new high-impact use cases for distribution-level flexibility. It will generate an evidence base to:

- Extend the value stack for flexibility providers: quantify system/customer benefits (£, MW, risk avoided, CO_2 reduced) for a shortlist of prioritised and validated use cases.
- Support efficient and fair investment decisions between traditional approaches and flexibility.

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

The project does not have a consumer vulnerability focus, however, will actively consider consumer vulnerability in the design and evaluation of flexibility use cases to ensure that no customer is left behind in the energy transition. By doing this by design rather than as an afterthought, the work promotes fairness and inclusivity from the start.

Success Criteria

The project's success criteria are:

- A shortlist of use cases prioritised through a criteria-based assessment.
- Quantified value ranges (in £, MW, CO$_2$ reduction, and risk avoided) provided for all prioritised use cases.
- Delivery of a simple CBA decision-support tool to assess costs/benefits.

Project Partners and External Funding

No additional external funding or project partner will be used to deliver the project.

Potential for New Learning

This project offers opportunities to generate new insights across technical, commercial, and regulatory dimensions of distribution-level flexibility. Identifying which use cases are most attractive, feasible, and inclusive for a wide range of market participants, including vulnerable customers.

Overall, the project will create a knowledge foundation that can guide future flexibility services, improve operational efficiency, inform regulatory frameworks, and support inclusive participation across the energy system. The project will also develop the landscape for future pilots of use cases which will deliver quantifiable benefits, as opposed to the strategic benefits offered by this research project.

Scale of Project

The scale of Flex Forward is justified by the need to comprehensively identify, prioritise, and validate multiple high-impact flexibility use cases across technical, commercial, and regulatory dimensions. The smaller scale of this project enables results to be delivered in an agile, focused, and valuable way. It allows rapid prioritisation of use cases, targeted qualitative and quantitative analysis, and streamlined stakeholder engagement — generating credible, actionable insights without the overheads of a larger programme.

Technology Readiness at Start

TRL1 Basic Principles

Technology Readiness at End

TRL3 Proof of Concept

Geographical Area

The learnings from this project will be directly applicable across all UK Power Networks licence areas. By developing a standardised framework for assessing and prioritising flexibility, the outputs can be replicated in different geographies and network conditions, ensuring that benefits are scalable and transferable across all areas.

Revenue Allowed for the RIIO Settlement

No funding was provided within the current RIIO settlement that will become surplus to requirements as a result of this project.

Indicative Total NIA Project Expenditure

The total project budget is £171,000, of which £153,900 (90%) will be recovered from NIA.

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 project facilitates the energy system transition by identifying and validating new flexibility use cases beyond that traditional use cases of network reinforcement deferral and congestion management. By evolving flexibility products beyond reinforcement deferral, the project supports whole-system optimisation and will provide new ways to engage small-scale flexibility to reach the Clean Power 2030 target, accelerating progress towards a net zero energy system.

This research project creates the evidence base to identify useful network needs which could be addressed more efficiently via flexibility services as an alternative solution. By identifying and quantifying the potential value of flexibility use cases (e.g. system efficiency, inclusivity, carbon reduction), the project provides the foundation for future initiatives that could reduce costs, enhance reliability, and support Net Zero for existing customers.

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

The project does not have a consumer vulnerability focus, however, will actively consider consumer vulnerability in the design and evaluation of flexibility use cases to ensure that no customer is left behind in the energy transition. By doing this by design rather than as an afterthought, the work promotes fairness and inclusivity from the start.

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

This section is not applicable to the project in accordance with the Ofgem NIA governance as it is a research-only project.

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

The method is highly replicable across GB. The evaluation framework, prioritisation criteria, and pilot designs are not specific to UK Power Networks' geography and the analysis of use cases, and CBA, could be applied by all DNOs. While local network conditions and data availability may influence detailed outcomes, the approach to identifying, quantifying, and validating flexibility use cases is fully transferable, ensuring wide applicability across the GB system.

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

The costs of rolling out the Method across GB would most likely be minimal. The outputs of the project, i.e. frameworks, evaluation criteria, pilot findings, and decision-support tools, could be applied by other Network Licensees without repeating the initial research. Rollout costs would mainly consist of applying the methodology to local data and engaging stakeholders. These costs are small

compared to the potential benefits in enabling fairer investment decisions, creating new flexibility opportunities, and accelerating low-carbon technology connections.

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 will generate transferable insights across operational, market, customer, and regulatory dimensions of distribution-level flexibility. Customer and stakeholder insights will ensure inclusivity, with relevance to vulnerable participants in every region.

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 project will not result in duplication, as no previous initiative has carried out a comprehensive and systematic deep dive into distribution-level flexibility use cases.

Previous innovation projects such as LEO, and various UK Power Networks' flexibility market trials have provided valuable insights into customer participation, market platforms, and operational feasibility. However, these have been technology-specific, geography-specific, or pilot-focused, testing "what works" in a narrow context.

What has not been done is a structured, overarching assessment that:

- Maps the full longlist of potential flexibility use cases across technical, commercial, customer, and regulatory dimensions.
- Quantifies and prioritises them against consistent criteria to identify those with the greatest impact and value.
- Develops a replicable evaluation framework and methodology that can be applied across all licence areas.

In short, while earlier projects have demonstrated the possibilities of flexibility, this project is the first to establish a robust, evidence-based framework to show which use cases provide the most value, why, and how they should be prioritised. It builds directly on prior learnings but fills a critical gap — ensuring resources and future trials are focused where they deliver maximum benefit, rather than duplicating work already completed.

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

Flex Forward is innovative because it moves beyond existing flexibility approaches, which have largely focused on constraint management, to identify and validate a broader set of high-impact use cases across technical, commercial, and regulatory dimensions. These use cases (e.g. flexibility for voltage management, accelerating LCT connections) have not previously been explored at distribution level in a structured, evidence-led way, combining prioritisation, techno-economic modelling, and real-world pilots. By validating these new applications of flexibility, the project enables optimisation of network operation, creation of new revenue streams for flexibility providers, and delivery of systems needed to reach Clean Power 2030 at the lowest cost for customers.

Relevant Foreground IPR

The project will generate Relevant Foreground IPR in the form of prioritised flexibility use cases, a simple cost–benefit analysis tool, and frameworks for evaluating and piloting new services. No Background IPR is required to use the outputs, which will be made available in line with NIA governance.

Outputs will be published through project reports, learning events, and the UK Power Networks innovation website to ensure accessibility by other licensees and stakeholders. Key findings will also be presented through ENA working groups and Ofgem consultations, enabling replication and maximising benefits across the GB system.

Data Access Details

Any data gathered during the Flex Forward project, including outputs from use case assessments and pilot trials, will be de-sensitised as necessary to protect commercially confidential information and customer data. This data may be shared with interested parties, whenever it is practicable and legal to do so, and it is in the interested of GB electricity customers. In accordance with the Innovation Data-Sharing Policy, UK Power Networks aims to make available all non-personal, non-confidential data on request.

The view the full Innovation data sharing policy, please visit UK Power Networks' website to access it here.

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

Flex Forward is not being funded as part of business-as-usual activities because it involves exploratory research with an unproven business case and uncertain outcomes. The project seeks to understand stakeholder appetite, validate use cases, and assess technical feasibility for wider adoption of new flexibility use cases none of which are guaranteed to result in immediate operational or commercial benefits.

The NIA provides an appropriate framework to support this type of early-stage research, enabling UK Power Networks to explore new ideas and gather evidence before committing to future investment or delivery.

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 requires innovation funding because it addresses unproven approaches with uncertain outcomes, where costs and

benefits cannot yet be guaranteed. Support from NIA enables UK Power Networks to explore, test, and de-risk new flexibility use cases that could transform future network operation and regulation. NIA funding also ensures the learning is shared across the industry, maximising benefits for customers, stakeholders, and the wider energy system.

This project has been approved by a senior member of staff

☑ Yes