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NIA Project Registration and PEA Document

Date of Submission

Aug 2026

Project Reference Number

NGED_NIA_090

Project Registration

Project Title

RED-Flex (Rapid, Everywhere, Dependable Flexibility)

Project Reference Number

NGED_NIA_090

Project Licensee(s)

National Grid Electricity Distribution

Project Start

August 2026

Project Duration

1 year and 8 months

Nominated Project Contact(s)

David Penfold

Project Budget

£1,068,969.00

Summary

RED-Flex (Rapid, Everywhere, Dependable Flexibility) will develop the technical, operational, commercial and regulatory evidence required to determine whether a Flexibility of Last Resort (FoLR) service could improve confidence in the dependable delivery of flexibility within electricity distribution networks. It will investigate whether a dependable fallback flexibility capability can provide an additional layer of operational resilience by supporting existing flexibility markets where contracted flexibility is unavailable or insufficient

The project will initially focus on the water sector, working collaboratively with participating water companies to assess the technical, operational and commercial feasibility of providing dependable flexibility from water assets.

Preceding Projects

10059797 - Shifting Currents

WPD_NIA_063 - Flexible Operation of Water Networks Enabling Response Services (FLOWERS)

Third Party Collaborators

Anglian Water

Smart Grid Consultancy

Isle Utilities

Severn Trent Water

Southern Water

Thames Water

South West Water

Northumbrian Water

Affinity Water

Scottish Water

Problem Being Solved

Distribution System Operators (DSOs) are increasingly relying on flexibility services to support strategic network planning, manage constraints and facilitate low-carbon connections. While flexibility markets have matured significantly, they cannot always guarantee dependable delivery during abnormal network conditions, post-fault restoration, low provider availability or market illiquidity.

This creates uncertainty in network planning and operations, reducing confidence in the dependable delivery of flexibility. As a result, networks may over-procure flexibility, retain conventional reinforcement options or bring forward reinforcement investment earlier than necessary, increasing costs and reducing the efficient utilisation of network capacity.

The issue is becoming more significant as the volume of flexibility required to support electrification, distributed energy resources and customer connections continues to grow. Greater reliance on flexibility also increases the importance of understanding and managing residual delivery risk where contracted services cannot perform as expected.

At the same time, there is no structured Flexibility of Last Resort (FoLR) capability that can provide a dependable fallback layer behind existing flexibility markets. This limits confidence in the wider adoption of flexibility as part of strategic network planning and operational decision making.

RED-Flex will address this gap by developing the technical, operational, commercial and regulatory evidence required to assess the feasibility of a Flexibility of Last Resort capability, initially through the water sector. The outputs will establish whether sufficient evidence exists to support progression to operational demonstrations and potential future business-as-usual deployment.

Method(s)

The RED-Flex project will develop the evidence required to determine whether a Flexibility of Last Resort (FoLR) service can provide a dependable fallback capability behind existing flexibility markets where delivery risk is elevated.

The project combines technical assessment, operational design, commercial framework development and regulatory engagement to determine whether a structured fallback flexibility service can improve confidence in the dependable use of flexibility within strategic network planning and operation.

The approach builds upon existing DSO flexibility markets and operational dispatch processes but investigates a new service concept intended to support circumstances where conventional flexibility markets cannot reliably deliver, including abnormal network conditions, post-fault restoration and areas with limited provider participation.

The project will initially focus on flexibility provided by water-sector assets, recognising their operational flexibility, geographical diversity and potential to provide dependable demand reduction. The project will assess whether this approach can be transferred to other provider types and future flexibility markets.

The project is structured into the following work packages:

- **WP1 – Project Governance and Mobilisation.**

- **WP2 – Water Sector Evidence and Asset Assessment**

Identification and assessment of suitable water-sector assets, operational constraints and flexibility capabilities to establish the evidence base for dependable flexibility provision.

• WP3 – Regulatory Alignment and DSO Assessment

Assessment of operational use cases, network requirements, regulatory considerations and commercial principles through collaboration with participating DNOs, Ofgem and Ofwat.

• WP4 – Service Design

Development of the Flexibility of Last Resort service specification, including technical, operational, commercial and governance requirements together with activation criteria, dispatch principles and performance measures.

• WP5 – Demonstration Readiness and Investment Case

Preparation of participating assets, operational processes, governance arrangements and demonstration plans to establish readiness for potential operational demonstrations. Completion of a Cost Benefit Analysis and supporting evidence to inform future work.

Outputs from each work package will be progressively reviewed against predefined acceptance criteria through the project's governance arrangements.

Measurement Quality Statement and Data Quality Statement

The project will primarily utilise existing operational, network, asset and flexibility market datasets provided by participating electricity network operators, water companies and project partners. Additional operational and asset information will be collected where required to support technical assessments, service design and demonstration readiness activities.

The project is intended to evaluate the technical, operational and commercial viability of a Flexibility of Last Resort service and is not developing new measurement equipment or measurement methodologies. Existing operational telemetry, monitoring systems and asset information will therefore be used wherever practical to support technical assessments and service design activities.

Data quality assessment and validation activities will be undertaken throughout the project to ensure that datasets used within technical assessments, operational evaluations and Cost Benefit Analysis activities are suitable, representative and traceable. This will include assessment of data completeness, consistency, operational relevance, temporal alignment and suitability for the intended analyses. All data processing, analysis, modelling and evaluation methodologies will be documented within project outputs and managed under the relevant partner quality assurance procedures.

Project findings, methodologies and validation processes will be recorded in sufficient detail to support reproducibility and dissemination of learning across GB electricity network operators.

A Data Protection Impact Assessment (DPIA) will be completed where required to assess and manage privacy risks associated with project datasets. The project will operate in accordance with applicable data protection legislation, internal governance procedures and agreed contractual data-sharing arrangements between project partners.

Where project partners or suppliers are provided access to NGED datasets or operational information, appropriate security and information governance controls will apply, including controlled access arrangements, secure data handling procedures and relevant contractual obligations. Data will be managed using appropriate technical and organisational controls proportionate to the sensitivity of the information being processed.

The project does not intend to publicly disclose commercially sensitive operational information or partner-specific data. Any published outputs, reports or shared datasets will be aggregated and anonymised where appropriate to ensure that commercially confidential or commercially sensitive information cannot be identified.

Scope

The RED-Flex project will develop the evidence required to determine whether a Flexibility of Last Resort (FoLR) service can improve confidence in the dependable delivery of flexibility within electricity distribution networks.

The scope covers the development of the technical, operational, commercial and regulatory evidence required to assess the feasibility

of a dependable fallback flexibility service. This includes assessment of flexibility delivery risks, evaluation of water-sector flexibility assets, development of a service specification, commercial and governance framework design, regulatory engagement and preparation for future operational demonstrations.

The assessment will initially focus on flexibility provided by participating water companies, assessing the ability of water-sector assets to provide dependable flexibility services under representative network conditions. The project will also assess the transferability of the proposed service model across other sectors and GB electricity network operators.

The project will:

- * Assess the technical, operational, commercial and regulatory feasibility of a Flexibility of Last Resort service.
- * Develop a Flexibility of Last Resort service specification, including technical, operational and commercial requirements.
- * Evaluate suitable water-sector assets and operational use cases.
- * Develop the governance, commercial and dispatch arrangements required to support a dependable flexibility service.
- * Complete a Cost Benefit Analysis to quantify the potential value of the proposed service.
- * Produce the evidence required to support a decision on whether future operational demonstrations should proceed.

Expected Benefits

For consumers

- * Improved confidence in dependable flexibility to support more efficient use of existing network capacity.
- * Potential to facilitate lower-cost network solutions and more efficient customer connections.
- * Reduced long-term network costs through better-informed investment decisions.

For the electricity distribution networks

- * Development of a structured Flexibility of Last Resort service model.
- * Improved understanding of the technical, operational, commercial and regulatory requirements for dependable flexibility.
- * Evidence to support future strategic network planning and operational decision making.
- * A transferable framework that could support wider adoption across GB electricity networks.

Financial Benefit Context

The project represents an evidence-led investment to determine whether a dependable Flexibility of Last Resort capability can deliver value for customers and network operators. Initial high-level analysis indicates potential benefits of approximately £4.3 million per annum across Great Britain, including around £1.3 million per annum for NGED. These estimates will be validated and refined through the project's Cost Benefit Analysis.

Strategic Position

RED-Flex supports the transition towards strategic network planning by improving confidence in dependable flexibility. It also aligns with the Energy Networks Innovation Challenge 5 ambition for decentralised system balancing by developing the evidence required to support dependable flexibility services.

Objective(s)

The objective of the RED-Flex project is to develop the technical, operational, commercial and regulatory evidence required to assess the feasibility of a Flexibility of Last Resort (FoLR) service for electricity distribution networks.

The project will:

- Develop a Flexibility of Last Resort service specification, including technical, operational, commercial and governance requirements.
- Assess flexibility delivery risks and identify the circumstances in which a dependable fallback flexibility service could provide value.
- Evaluate the suitability of water-sector assets to provide dependable flexibility services under representative operational conditions.
- Assess DSO operational requirements, use cases and integration considerations for a Flexibility of Last Resort service.
- Engage with Ofgem, Ofwat, participating DNOs and water companies to assess regulatory, commercial and governance requirements.
- Develop the commercial, operational and dispatch arrangements required to support future operational demonstrations.
- Complete a Cost Benefit Analysis to quantify the potential customer, network and financial benefits of a Flexibility of Last Resort

service.

- Assess the transferability of the proposed service model to other sectors, flexibility providers and GB electricity network operators.
- Produce the evidence required to support a decision on whether the project should progress to operational demonstrations.

Consumer Vulnerability Impact Assessment

The RED-Flex project is not expected to have any direct adverse impact on consumers in vulnerable situations, as it focuses on the development of the technical, operational, commercial and regulatory evidence required to assess a Flexibility of Last Resort (FoLR) service. The project does not involve changes to customer supplies or direct intervention at customer premises.

However, the project has the potential to deliver indirect benefits by improving confidence in the dependable delivery of flexibility services and supporting more resilient network operation.

Technical impacts:

- * Improved understanding of dependable flexibility may support more resilient network operation during abnormal network conditions or flexibility service non-delivery.
- * Development of a structured fallback flexibility concept may reduce operational risk associated with flexibility-dependent network management.

Financial impacts:

- * Improved confidence in flexibility may support more efficient use of existing network capacity and reduce unnecessary reinforcement or flexibility over-procurement, helping to minimise long-term costs borne by consumers.
- * The project's Cost Benefit Analysis will assess the potential financial value of a Flexibility of Last Resort service and its potential impact on customer value.

Wellbeing impacts:

- * More resilient network operation has the potential to improve continuity of supply, benefiting all customers, including those in vulnerable situations who may be more significantly affected by network interruptions.
- * Improved evidence to support strategic network planning may facilitate more reliable connection of low-carbon technologies, contributing to longer-term customer resilience and affordability.

The project will also improve industry understanding of dependable flexibility services, supporting future decisions on whether a Flexibility of Last Resort capability could deliver wider consumer benefits while maintaining network resilience and security.

Success Criteria

The success of the RED-Flex project will be evaluated against the following criteria:

1. Technical and operational feasibility established

- * Successful development of a Flexibility of Last Resort (FoLR) service specification, including technical, operational and dispatch requirements.
- * Evidence that the proposed service addresses identified flexibility delivery risks and defined DSO use cases.

2. Water-sector capability assessed

- * Successful assessment of participating water-sector assets and their suitability to support a dependable flexibility service.
- * Identification of operational opportunities, constraints and requirements for service delivery.

3. Commercial and regulatory framework developed

- * Completion of the commercial, governance and regulatory framework required to support a Flexibility of Last Resort service.
- * Engagement with participating DNOs, Ofgem, Ofwat and project partners to inform service design.

4. Cost Benefit Analysis completed

- * Completion of a robust Cost Benefit Analysis quantifying the potential customer, network and financial benefits of the proposed

service.

- * Clear articulation of assumptions, limitations and applicability of the results.

5. Demonstration readiness established

- * Completion of demonstration planning, governance arrangements and operational readiness activities.

- * Evidence that sufficient technical, operational, commercial and regulatory information has been developed to support potential future operational demonstrations.

6. Transferability and scalability assessed

- * Assessment of the applicability of the proposed service model across other sectors, flexibility providers and GB electricity network operators.

- * Identification of requirements for future operational demonstrations and potential business-as-usual deployment.

Project Partners and External Funding

Project Partners

National Grid Electricity Distribution (NGED)

NGED is the project lead and sponsor, responsible for overall project governance, programme oversight and ensuring alignment with DSO operational requirements and strategic network planning. NGED will provide operational expertise, coordinate regulatory engagement and lead dissemination of project outputs across the electricity distribution sector.

Smart Grid Consultancy (SGC)

Smart Grid Consultancy is a delivery partner coordinating technical collaboration and engagement between the participating Distribution Network Operators. SGC will lead the development of the Flexibility of Last Resort service concept, service specification, Cost Benefit Analysis and governance framework, while ensuring that project outputs reflect the operational requirements of all participating DNOs.

Isle Utilities

Isle Utilities is a delivery partner, leading engagement with participating water companies, coordinate water-sector input to the project, supporting the assessment of suitable assets and operational use cases, and ensuring that the proposed Flexibility of Last Resort service reflects water industry operational requirements and practices.

UK Power Networks (UKPN)

UKPN will provide DSO operational expertise, participate in the assessment of operational use cases and review the applicability of the proposed service across different electricity distribution networks.

Northern Powergrid (NPg)

Northern Powergrid will contribute operational and engineering expertise, supporting assessment of network requirements, service design and transferability of the proposed approach.

Scottish Power Energy Networks (SPEN)

SPEN will provide operational input and technical review, ensuring the proposed service is applicable across multiple GB distribution network operators and operating environments.

Participating Water Companies

Participating water companies will provide operational knowledge, asset information and technical input to assess the feasibility of using water-sector assets to deliver dependable flexibility services. They will contribute to service design, operational assessment and evaluation of the proposed Flexibility of Last Resort concept.

Participating companies include:

- * Anglian Water
- * Thames Water
- * Severn Trent Water
- * Southern Water
- * South West Water
- * Northumbrian Water
- * Affinity Water
- * Scottish Water

Regulatory Engagement

The project will engage with Ofgem and Ofwat throughout delivery to ensure the proposed service reflects emerging regulatory, commercial and policy requirements. These organisations are not project partners and will not receive project funding.

External Funding

The project will be funded through the Network Innovation Allowance, an NGED contribution and agreed financial contributions from participating project partners.

The agreed partner contributions total £124,350 and are included within the total project cost.

No other external grant funding has been secured for the project.

Potential for New Learning

Knowledge Dissemination

The project will generate learning on the feasibility of a Flexibility of Last Resort (FoLR) service and the role that dependable flexibility could play in supporting strategic network planning and operation.

Learning will be generated on the technical, operational, commercial and regulatory requirements needed to establish a dependable fallback flexibility capability, including the circumstances in which such a service could provide value alongside existing flexibility markets.

The project will also provide learning on the suitability of water-sector assets to provide dependable flexibility services, including operational constraints, service availability, dispatch considerations and the factors that influence dependable service delivery. This will help determine the extent to which the proposed approach could be transferred to other sectors and flexibility providers.

Additional learning will focus on the development of the service specification, governance arrangements and commercial framework required to support a Flexibility of Last Resort service. This will include understanding the regulatory considerations associated with cross-sector flexibility, market integration and future operational deployment.

The project will also generate learning through the Cost Benefit Analysis, identifying the potential customer, operational and financial value of dependable flexibility and the conditions under which a Flexibility of Last Resort capability could provide benefits to electricity distribution networks.

The learning generated is expected to be highly transferable across GB electricity network operators because the project is focused on developing a generic service model rather than a solution specific to a single network area or flexibility provider. The outputs will provide guidance that can be applied by other Distribution Network Operators (DNOs) and Distribution System Operators (DSOs), flexibility providers and other critical infrastructure sectors.

Learning will be disseminated throughout the project through:

- * ENA Smarter Networks Portal.
- * Project webinars and stakeholder workshops.
- * ENA Energy Innovation Summit.
- * NGED Innovation Website.

* Industry conferences and cross-sector engagement events where appropriate.

These dissemination activities will ensure that the learning generated by RED-Flex is shared across the electricity and water sectors, supporting wider understanding of dependable flexibility services and informing future innovation, policy development and potential business-as-usual adoption.

Scale of Project

Geographic and Technical Scale

The RED-Flex project will be undertaken across multiple electricity distribution network areas and participating water company operational regions to ensure that the proposed Flexibility of Last Resort (FoLR) service is assessed under a representative range of network and operational conditions.

The project will initially focus on flexibility provided by participating water companies, selecting representative assets and operational use cases based on technical suitability, operational characteristics and their potential to provide dependable flexibility services.

The assessment will consider a range of factors, including:

* Network Characteristics: Areas representing different network topologies, constraint types and operational requirements across participating DNOs.

* Water Sector Operations: A representative range of water and wastewater assets with differing operational flexibility, asset types and duty cycles.

* Geographical Diversity: Multiple regions across Great Britain to ensure learning is applicable across different operational, environmental and network conditions.

* Operational Use Cases: A range of credible flexibility scenarios where a Flexibility of Last Resort service could provide value, including abnormal network conditions and constrained network locations.

The project will work with participating DNOs and water companies to identify a representative sample of suitable sites and operational use cases. The scale of the assessment has been selected to provide sufficient diversity to evaluate technical feasibility, operational applicability and transferability.

The project is designed to develop a transferable service model rather than a solution specific to a single network area, water company or flexibility provider. By assessing the concept across multiple network operators and water companies, the project will generate learning that is applicable across GB electricity distribution networks.

Technology Readiness at Start

TRL2 Invention and Research

Technology Readiness at End

TRL4 Bench Scale Research

Geographical Area

The project will be delivered across participating electricity distribution network operators (DNOs) and water companies within Great Britain.

The project will initially focus on participating water companies, with candidate sites and assets selected based on operational suitability, flexibility potential, data availability and relevance to the identified DSO use cases. Site selection will ensure that a representative range of operational environments, asset types and network conditions are considered.

The Funding Licensee is National Grid Electricity Distribution (NGED). The project will also involve UK Power Networks (UKPN), Northern Powergrid (NPG) and Scottish Power Energy Networks (SPEN), ensuring that the proposed Flexibility of Last Resort service is assessed across multiple GB electricity distribution networks and is not specific to a single licence area.

By involving multiple DNOs and a diverse group of participating water companies, the project will generate learning that is representative of different network characteristics, operational practices and flexibility requirements across Great Britain.

Revenue Allowed for the RII Settlement

None

Indicative Total NIA Project Expenditure

Total Project Cost	£ 1,068,969
Agreed Partner Contributions	£ 124,350
Sub Total	£ 944,619
NGED DNO Contribution	£ 94,462
Funding from NIA	£ 850,157

Project Eligibility Assessment Part 1

Requirement 1

Facilitate the energy system transition and/or benefit consumers in vulnerable situations

Please answer **at least one** of the following:

How the Project has the potential to facilitate the energy system transition:

The RED-Flex project supports the transition to a smarter, more decentralised energy system by developing the evidence required to assess a Flexibility of Last Resort (FoLR) service that could improve confidence in the dependable delivery of flexibility across electricity distribution networks.

As Distribution System Operators (DSOs) increase their reliance on flexibility to manage constraints, facilitate low-carbon connections and support strategic network planning, confidence in dependable flexibility becomes increasingly important. RED-Flex will assess whether a structured fallback flexibility capability can reduce uncertainty associated with flexibility service non-delivery and support more efficient operational and investment decisions.

The project will initially focus on flexibility provided by the water sector, assessing the technical, operational, commercial and regulatory requirements for dependable flexibility services. The resulting evidence will determine whether the proposed service model has the potential to be applied more widely across other sectors and flexibility providers.

By improving understanding of how dependable flexibility could support strategic network planning, the project has the potential to reduce unnecessary network reinforcement, improve utilisation of existing network assets and facilitate the efficient connection of low-carbon technologies.

The project also aligns with the Energy Networks Innovation Challenge 5 ambition for decentralised system balancing, generating the evidence required to assess how dependable flexibility services could support future distributed energy systems.

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

RED-Flex has the potential to benefit consumers in vulnerable situations indirectly through improvements in network resilience and more efficient network investment. Vulnerable customers can be affected by power interruptions and increasing energy costs. By assessing whether dependable flexibility can improve confidence in network operations and planning, the project could support more resilient operation of the electricity network and more efficient use of existing assets. If successful, this may help reduce long-term network costs and support secure and reliable electricity supplies, benefiting all customers, including those in vulnerable situations.

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

n/a

Please provide a calculation and/or description of the expected benefits of the solution

The project will develop the technical, operational, commercial and regulatory evidence required to assess whether a Flexibility of Last Resort (FoLR) service can deliver net benefits to electricity consumers by improving confidence in the dependable use of flexibility.

Initial high-level analysis indicates that, if successfully implemented, the proposed service has the potential to deliver benefits of approximately £4.3 million per annum across Great Britain, including approximately £1.3 million per annum within NGED. These estimates will be refined and validated through the project's Cost Benefit Analysis.

Current DSO practice requires flexibility to be treated conservatively where delivery risk exists. This can result in:

- * Over-procurement of flexibility services.
- * Earlier or unnecessary network reinforcement.
- * Reduced utilisation of existing network capacity.
- * More conservative operational and strategic network planning decisions.

By developing and assessing a dependable fallback flexibility capability, the proposed solution has the potential to:

- * Improve confidence in the dependable use of flexibility.
- * Reduce unnecessary flexibility over-procurement.
- * Support more efficient utilisation of existing network assets.
- * Defer or avoid unnecessary network reinforcement.
- * Improve network resilience during abnormal operating conditions.
- * Support more efficient strategic network planning and investment decisions.

The principal beneficiaries of these improvements are electricity consumers through lower long-term network costs, more efficient investment in network infrastructure and improved utilisation of flexibility services. .

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

The Flexibility of Last Resort (FoLR) service being developed through RED-Flex is intended to be highly transferable across Great Britain, as it is based on generic operational, commercial and regulatory principles rather than infrastructure specific to a single network operator or flexibility provider.

Although the project will initially assess the concept using water-sector assets, the service model is being designed to be technology and sector agnostic. The project will evaluate how the proposed approach could be applied to other dependable flexibility providers and across different electricity distribution network areas.

The project involves National Grid Electricity Distribution (NGED), UK Power Networks (UKPN), Northern Powergrid (NPg) and SP Energy Networks (SPEN), ensuring that the service design is informed by multiple operational environments and representative DSO requirements. This collaborative approach will help ensure that the outputs are applicable across all GB electricity distribution networks.

The project will also define the technical, commercial, governance and regulatory requirements necessary to support wider adoption. This includes development of a transferable service specification, commercial framework and implementation guidance that could be adopted by other network operators and future flexibility providers.

The learning generated through the project is expected to be applicable across all GB electricity distribution licence areas and will provide a foundation for future operational demonstrations and potential business-as-usual deployment.

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

The rollout costs associated with a Flexibility of Last Resort (FoLR) service are expected to be primarily operational and commercial rather than capital intensive, as the proposed approach is intended to build upon existing flexibility markets, dispatch arrangements and network operational processes.

Implementation costs would principally be associated with:

- * Integration of the FoLR service into existing flexibility procurement and dispatch arrangements.
- * Development of commercial agreements with participating flexibility providers.
- * Operational procedures, training and governance to support service activation and management.
- * Systems integration, monitoring and reporting to support dependable service delivery.
- * Ongoing service management, performance monitoring and continuous improvement.

As the project will initially focus on water-sector flexibility providers, wider rollout may require engagement with additional sectors and flexibility providers to establish suitable commercial and operational arrangements.

The project will develop the evidence required to define the technical, operational, commercial and governance requirements for wider deployment. A detailed assessment of implementation costs and expected consumer benefits will be completed through the project's

Cost Benefit Analysis.

The proposed service is intended to leverage existing flexibility market arrangements wherever practical, reducing the need for significant new infrastructure investment while supporting more efficient utilisation of existing flexibility resources. If proven successful, this approach has the potential to provide a scalable and cost-effective model for deployment across GB electricity distribution networks.

Requirement 3 / 1

Involve Research, Development or Demonstration

Projects 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

Involve Research, Development or Demonstration - Please select all that apply

- ☐ 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 generated from RED-Flex will be directly applicable to all GB electricity Network Licensees, as it focuses on the development of a transferable Flexibility of Last Resort (FoLR) service that complements existing flexibility markets and supports more dependable network operation.

The project will provide:

- * A Flexibility of Last Resort service specification, including technical, operational, commercial and governance requirements.
- * Evidence on the circumstances in which a dependable fallback flexibility service could improve confidence in strategic network planning and operation.
- * Guidance on integrating a Flexibility of Last Resort capability with existing flexibility procurement, dispatch and operational processes.
- * A Cost Benefit Analysis quantifying the potential customer, operational and financial value of dependable flexibility.
- * Recommendations on regulatory, commercial and cross-sector governance arrangements required to support future deployment.

This learning can be used by other Network Licensees to assess whether a Flexibility of Last Resort capability could improve operational resilience, reduce flexibility delivery risk and support more efficient network planning and investment decisions.

In particular, the outputs will support:

- * Improved confidence in the dependable use of flexibility services.
- * More efficient utilisation of existing network capacity.
- * Reduced reliance on unnecessary flexibility over-procurement and premature network reinforcement.

- * Consistent approaches to assessing, procuring and operating dependable flexibility services.
- * Future cross-sector collaboration between electricity networks and flexibility providers.

As the project is being developed with National Grid Electricity Distribution (NGED), UK Power Networks (UKPN), Northern Powergrid (NPg), SP Energy Networks (SPEN) and multiple water companies, the learning will be informed by a broad range of operational environments and will be readily transferable across GB electricity distribution networks.

Learning will be disseminated through the ENA Smarter Networks Portal, project reports, webinars, industry conferences, stakeholder workshops and Energy Networks Innovation events, ensuring that the outputs are available to all GB Network Licensees and other relevant stakeholders.

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, LCNE, NIA, NIC or SIF projects already registered, being carried out or completed. Networks must explicitly mention similar projects that they have considered and how these differ.

Please demonstrate below that no unnecessary duplication will occur as a result of the Project.

A review of relevant innovation projects has been undertaken to ensure that RED-Flex complements, rather than duplicates, existing work.

RED-Flex has been developed in response to a recognised gap in the electricity flexibility landscape: while flexibility markets continue to mature, there remains no structured mechanism to provide a dependable fallback capability when flexibility delivery is uncertain. The project will investigate whether a Flexibility of Last Resort (FoLR) service can improve confidence in strategic network planning and operation.

The water sector has been selected as the initial demonstration environment because previous innovation identified it as offering significant, geographically distributed and controllable flexibility potential. FLOWERS (WPD_NIA_063) and Shifting Currents (SIF Discovery) explored how water company assets could participate in electricity flexibility markets and established the foundations for collaboration between electricity networks and water companies.

RED-Flex does not repeat this work. Instead, it builds on these foundations by investigating whether a dependable fallback flexibility service can be developed and adopted at a wider operational scale. The project expands the scope of previous work by involving four electricity distribution network operators and eight water companies, providing a broader and more representative assessment across multiple network areas, operational environments and asset portfolios.

The project will therefore generate new learning on reliability assessment, service design, commercial arrangements, governance and operational deployment planning for a Flexibility of Last Resort capability. This represents a distinct area of innovation that has not previously been investigated through GB electricity network innovation projects and will provide evidence to support future operational demonstrations and potential wider adoption across Great Britain.

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

Electricity Distribution System Operators (DSOs) are increasingly relying on flexibility to support strategic network planning, manage network constraints and facilitate low-carbon connections. Whilst flexibility markets have matured significantly, there is currently no

established mechanism that provides a dependable fallback capability when contracted flexibility cannot be delivered. As a result, flexibility often needs to be treated conservatively, reducing confidence in strategic network planning and operational decision-making.

RED-Flex introduces a novel approach by:

- * Developing a structured Flexibility of Last Resort (FoLR) service designed to complement existing flexibility markets by providing a dependable fallback capability.
- * Combining technical, operational, commercial and regulatory innovation within a single service framework.
- * Developing methodologies to assess and quantify flexibility dependability and delivery confidence, rather than simply flexibility availability.
- * Creating governance and commercial arrangements that enable dependable cross-sector flexibility between electricity networks and water companies.
- * Assessing the applicability of the approach across multiple electricity network operators and eight water companies to demonstrate scalability and transferability.

Previous innovation projects, including FLOWERS and Shifting Currents, explored the potential for water company assets to participate in electricity flexibility markets and established the foundations for collaboration between the electricity and water sectors. However, they did not investigate the concept of a Flexibility of Last Resort service or the methodologies required to assess, quantify and operate dependable fallback flexibility.

RED-Flex addresses this recognised gap by investigating whether dependable flexibility can provide greater confidence in strategic network planning and operational decision-making. The project will generate new learning on service design, reliability assessment, commercial frameworks, governance arrangements and the operational requirements needed to support future deployment.

The project also carries technical, operational, commercial and regulatory risks. These include determining appropriate service activation criteria, establishing workable cross-sector commercial arrangements, quantifying consumer and network value, and understanding how a Flexibility of Last Resort capability could integrate with existing DSO planning and flexibility market processes. These uncertainties mean the concept is not yet suitable for business-as-usual deployment and require structured innovation to establish whether the proposed approach is suitable for operational demonstration.

RED-Flex therefore represents a significant departure from current practice by developing the evidence required to determine whether a Flexibility of Last Resort service can improve confidence in strategic network planning and support future operational deployment

Relevant Foreground IPR

The project is expected to generate a range of relevant foreground intellectual property associated with the development of a Flexibility of Last Resort (FoLR) service. Expected foreground IPR includes:

- * A Flexibility of Last Resort (FoLR) service specification.
- * Dependability assessment and confidence methodologies for flexibility services.
- * Service activation criteria, operational procedures and governance frameworks.
- * Commercial frameworks and contractual models supporting dependable flexibility provision.
- * Cost Benefit Analysis methodologies and evaluation frameworks for dependable flexibility services.
- * Reliability assessment methodologies and performance metrics.
- * Cross-sector operating models and implementation guidance for electricity and water sector collaboration.
- * Operational learning, demonstration planning outputs and recommendations to support future business-as-usual deployment.

Foreground IPR will be created collaboratively by the project partners in accordance with the project's Collaboration Agreement and the Network Innovation Allowance (NIA) Governance Document. Ownership and licensing arrangements will be managed under the agreed contractual provisions, ensuring that project learning can be disseminated appropriately while protecting partner-owned background intellectual property.

Data Access Details

The project will utilise existing operational, network, flexibility market and asset datasets provided by participating electricity network operators, water companies and project partners. Additional operational, technical and asset information will be collected where required to support technical assessments, service design, commercial framework development and the development of the evidence required to inform future work.

Where required, data will be anonymised, aggregated or de-sensitised to ensure compliance with data protection legislation, commercial confidentiality obligations and critical national infrastructure security requirements.

Access to project data and outputs will be managed in accordance with NGED's data governance policies and the RIIO-2 Network Innovation Allowance (NIA) Governance Document. Interested parties will be able to request access to appropriate methodologies, aggregated datasets and project outputs through standard NGED data sharing processes.

Where appropriate, non-sensitive outputs will be made publicly available, including:

- * Flexibility of Last Resort service specification.
- * Methodologies and analytical approaches.
- * Aggregated operational and performance data.
- * Cost Benefit Analysis and key findings.
- * Reports, guidance and project learning.

Certain datasets, including detailed operational network information, water company operational data and commercially sensitive flexibility market information, may not be released directly due to:

- * Commercial confidentiality.
- * Data protection requirements.
- * Critical national infrastructure security considerations.
- * Contractual data sharing restrictions.

Where possible, anonymised, aggregated or representative datasets will be provided to support replication of learning without compromising security or commercial interests.

Project learning and outputs will be disseminated through the ENA Smarter Networks Portal, project reports, webinars and industry events, ensuring that the benefits of the project are accessible to all GB electricity Network Licensees and other relevant stakeholders.

Please identify why the Network Licensees will not fund the project as a part of its business and usual activities

The Network Licensee is not funding this project as part of business-as-usual (BAU) activities because there is currently insufficient operational, commercial and economic evidence that a Flexibility of Last Resort (FoLR) service would deliver sufficient customer and network benefits to justify implementation.

Whilst flexibility markets are now established, there is no proven approach for providing a dependable fallback capability when contracted flexibility cannot be relied upon. Consequently, current network planning and operational processes do not include a Flexibility of Last Resort service.

The project involves a number of uncertainties that are not appropriate for BAU investment, including:

- * Developing the technical, operational, commercial and regulatory evidence required to support a Flexibility of Last Resort service.
- * Assessing the dependability and reliability of flexibility from water-sector assets.
- * Establishing new commercial, contractual and governance arrangements across electricity networks and water companies.
- * Evaluating operational integration with existing flexibility procurement and dispatch processes.
- * Quantifying the customer, operational and financial value of dependable flexibility through a comprehensive Cost Benefit Analysis.

These activities involve technical, commercial, operational and regulatory risks that cannot currently be justified through business-as-usual expenditure. Until sufficient evidence has been generated, implementation within operational network activities would represent an unacceptable level of delivery risk.

Network Innovation Allowance (NIA) funding is therefore required to develop the evidence needed to determine whether a Flexibility of Last Resort capability should progress to operational demonstrations and potential future deployment.

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 NIA funding because it seeks to develop the technical, operational, commercial and regulatory evidence required to determine whether a Flexibility of Last Resort (FoLR) service is suitable for operational demonstration within GB electricity

networks. The concept involves technical, operational, commercial and regulatory uncertainties that make it unsuitable for funding through business-as-usual or commercial investment.

From a technical perspective, the project will develop new methodologies to assess flexibility dependability, establish service activation criteria and determine whether a structured fallback capability can be reliably integrated with existing flexibility markets. There is a risk that the proposed approach does not deliver sufficient operational confidence or performance to justify wider deployment.

From an operational perspective, the project will investigate how a Flexibility of Last Resort service could be incorporated into existing DSO planning, procurement and dispatch processes. There is uncertainty regarding operational integration, scalability and how the service would perform across different network conditions and participating organisations.

From a commercial perspective, the project requires the development of new contractual models and commercial arrangements involving multiple electricity network operators and water companies. There is a risk that the proposed arrangements may not prove sufficiently practical, cost-effective or attractive to support future business-as-usual implementation.

From a regulatory and governance perspective, the project will explore a new cross-sector service model involving electricity and water sectors. Further evidence is required to understand the regulatory, governance and policy implications before any enduring service could be adopted.

Finally, from an investment perspective, the customer and network benefits remain unproven. Although the project has identified significant potential value, a more robust Cost Benefit Analysis and operational evidence would be required before Network Licensees could justify investment through business-as-usual funding, this project will help to deliver this justification.

This project has been approved by a senior member of staff

☒ Yes