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

Apr 2025

Project Reference Number

NIA_UKPN0109

Project Registration

Project Title

Indus 2.0

Project Reference Number

NIA_UKPN0109

Project Licensee(s)

UK Power Networks

Project Start

April 2025

Project Duration

1 year and 2 months

Nominated Project Contact(s)

Sarah Golobish

Project Budget

£663,208.00

Summary

The project will involve identifying the location of industrial customers and their associated energy consumption, drafting data-sharing agreements between project partners and establishing a data-sharing infrastructure. Indus 2.0 aims to enhance the forecasting of industrial decarbonisation by developing data-sharing agreements between Distribution Network Operators (DNOs) and Gas Distribution Networks (GDNs), with the shared data being used to inform potential decarbonisation routes for several industrial sectors.

Stakeholder engagement will ensure scalability and alignment with industrial customers' decarbonisation goals. The project will also develop a comprehensive report and materials for dissemination of learnings. The learnings from Indus 2.0 will allow network operators to become better informed as to how they can best support industrial customers in the decarbonisation of their processes.

Preceding Projects

10061338 - Indus

10086034 - Indus

Third Party Collaborators

Guidehouse

Nominated Contact Email Address(es)

innovation@ukpowernetworks.co.uk

Problem Being Solved

The Seventh Carbon Budget (2038-2042), published in February 2025, and prepared by the Climate Change Committee, notes in their “Balanced Pathway” that by 2040 electricity will meet 61% of industrial energy demand, up from around 26% in 2025. The major sources of heat in industry are predicted to be replaced with electric options including electric boilers, electric ovens, electric furnaces in the glass sector, and, most significantly, electric heat pumps. Electrifying industry will allow UK manufacturers to benefit from global demand for low-carbon goods.

Challenges related to the decarbonisation of industrial customers faced by energy networks include:
A limited understanding of how and when industrial sites will decarbonise, thus creating uncertainty in future load growth forecasts and subsequent investment decisions.
Uncertainty around the potential future impact of decarbonising heat in industrial applications.
The decarbonisation of industrial heat processes will have a significant impact as typical gas fuelled processes could start to use electric heat pumps, electric boilers, etc.
Applicable decarbonisation routes for industrial customers will be of benefit for both DNOs and GDNs as these could include electricity, hydrogen, blended hydrogen and natural gas, biomethane.
A lack of understanding of how customers may look to deploy behind the meter generation or energy storage to support their decarbonisation.

A lack of research and coordinated whole systems planning in relation to industrial decarbonisation may lead to underestimating future load growth in investment decisions by both DNOs and GDNs. This may result in the need for multiple network interventions to accommodate future demand. Repeated interventions may delay industrial decarbonisation and increase consumer costs. Adopting a whole systems approach is essential, as many industries are likely to pursue a combination of switching to low-carbon gases and electrifying their processes.

Method(s)

The project will develop legal frameworks for data sharing between networks, suitable decarbonisation routes for several industrial sectors and tools to enhance the forecasting of industrial decarbonisation. These will be achieved through a combination of desktop research, stakeholder engagement, technical design, implementation, and solution testing. Key aspects of the methodology include:

- Identifying industrial customers within UK Power Networks’ and SGN’s shared operating area by collating available data from both parties, and external sources.
- Drafting data-sharing agreements between UK Power Networks, SGN, and NESO.
- Developing a data-sharing infrastructure to exchange electricity and gas network data between UK Power Networks, SGN, and NESO.
- Sharing of data between project partners (UK Power Networks, SGN, NESO and Guidehouse) across an area of overlapping network between SGN and UK Power Networks in the south east of England.
- Running a trial data cleansing exercise for the data across this subsection before scaling based on the learnings across the full dataset.
- Creating multiple decarbonisation routes for industrial customer types and understanding how these learnings can be integrated into network demand forecasting techniques.
- Engaging with other DNOs and GDNs to capture scaling requirements across networks post-project.
- Gaining feedback through customer engagement to validate decarbonisation routes and input sector specific assumptions.

Indus 2.0 will examine a subset of industrial energy demand which could include the following categories of industry:

- Paper & pulp
- Sugar
- Brick & tiles
- Malting, food processing
- Oil refining
- Pharmaceuticals
- Bulk chemicals
- Vehicle manufacturing
- Baked goods and
- Agriculture

This approach will allow for future scalability of the solution across UK Power Networks, as well as nationally and internationally.

Scope

The scope of the project will include the following work packages as described below:

Work Package 0: Project Management
Conducting a kick-off meeting, holding regular check-ins, and ensuring compliance with governance standards to manage project scope, milestones, and risks.

Work Package 1: Data Discovery
Identifying, and documenting required energy consumption data from industrial users, exploring existing data sources and mapping data storage structures across network operators.

Work Package 2: Data Sharing Agreements
Developing and finalising data sharing agreements between UK Power Networks, SGN, and NESO, ensuring compliance with legal and regulatory requirements.

Work Package 3: Data Sharing Architecture Design and Infrastructure
Establishing a data sharing infrastructure, designing blueprints for enduring solutions, and aligning data sharing practices.

Work Package 4: Data Cleansing and Mapping
Cleansing and mapping shared data between UK Power Networks and SGN, ensuring data quality and alignment of project outputs so they can be used to inform the inputs for forecasting models.

Work Package 5: Decarbonisation Routes and Forecasting
Developing industrial decarbonisation routes and guidebooks, aligning with Future Energy Scenarios to enhance network forecasting processes.

Work Package 6: Reports and Handover
Compiling comprehensive reports, producing a cost benefit analysis, conducting final dissemination activities, and developing an implementation roadmap and handover pack for project outcomes.

Objective(s)

The project will set out to achieve the following objectives:

- Identify available data sources on industrial customers within UK Power Networks and SGN plus other external datasets.
- Develop data sharing agreements between UK Power Networks, SGN and NESO ensuring compliance with relevant regulations.
- Establish and test a data sharing infrastructure between UK Power Networks, SGN and NESO in a selected trial region.
- Develop industrial potential decarbonisation routes for the high impact industries.
- Industrial customer engagement and validation of decarbonisation routes.
- Improve forecasting approach for future energy demands of industrial customers (subject to the findings of the project).

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

This project focuses solely on industrial customers and will not impact supply or services delivered for domestic customers, including customers in vulnerable situations.

Success Criteria

The success of the project will be evaluated by reviewing progress against the following criteria:

- Data sharing agreement developed and implemented between project partners.
- Data sharing infrastructure implemented and Industrial customer data is shared between SGN, UK Power Networks and NESO.
- Decarbonisation routes for a range of relevant industrial sectors are developed and approved by network operator subject matter experts (SMEs).
- Completed stakeholder engagement for validation of data and decarbonisation routes with industrial customers.

Project Partners and External Funding

Project partners include UK Power Networks, SGN, NESO and Guidehouse. The costs for this project will be fully funded through the NIA and will require no external funding. Further details of the NIA funding split between UK Power Networks, SGN and NESO are

included in Section 2.14.

Potential for New Learning

Indus 2.0 builds on the previous SIF Round 2 Discovery and Alpha Phases of project Indus, led by UK Power Networks.

The SIF Alpha and Discovery Phases of Indus focused on the decarbonisation of clusters of industrial sites. Typically, decarbonisation of these sites is planned in isolation, leading to multiple applications, iterations and potential stranded assets. Indus Alpha proposed a commercial framework for developing Net Zero industrial hubs where adjacent industrial sites collaborate, enabling a coordinated and clustered approach to decarbonisation. These Indus sites would optimise connection requests and energy infrastructure, minimising reinforcement needs, streamlining connections processes and enhancing cost-effectiveness for both industrial customers and end-users.

Indus 2.0 builds off of this work and will focus on obtaining access to datasets to identify, locate and categorise different industry and commercial sites and understand their decarbonisation options.

The project is expected to deliver the following learnings:

- What industrial customer data is available within DNOs, GDNs and other external sources.
- How industrial customer data can be shared between DNOs and GDNs.
- How DNO and GDN data can be mapped to provide a more complete dataset within each organisation.
- How data may need to be cleansed to before generating decarbonisation routes.
- How industrial decarbonisation routes will impact electricity network headroom across a range of pathways.
- How incorporating industrial decarbonisation routes in network forecasting may result in different future network investment decisions.

We will disseminate our findings and learnings at the end of the project through a show and tell webinar alongside engagement throughout the project with other networks and industrial energy users.

Scale of Project

The Indus 2.0 project is designed to address the decarbonisation of industrial processes focused in the south east of England where overlap exists between UK Power Networks' and SGN's network areas to demonstrate the proof of concept data sharing and decarbonisation modelling. By focusing on these smaller areas of overlap, the project will refine its methodologies and technologies in a "pilot" unlocking the ability to scale up to larger regions after project close, minimising risks and ensuring the effectiveness and reliability of the solutions. This ensures that innovation funding is leveraged efficiently to trial the solution before scaling more widely.

Based on the outcomes of the research and proof of concept conducted in the pilot area, any data-sharing solutions, agreements, and decarbonisation routes could be rolled out more widely. The insights gained through this project will inform the development of blueprints and frameworks for broader implementation. This planning phase will consider the scalability of the solutions, ensuring they can be adapted and applied to other geographical areas within UK Power Networks' and SGN's network areas, as well as nationally and internationally. We will be working with our partners to identify the scale of the required integration and the benefits that will result from it both within the pilot area and beyond.

Technology Readiness at Start

TRL2 Invention and Research

Technology Readiness at End

TRL4 Bench Scale Research

Geographical Area

The project, conducted in partnership with UK Power Networks and SGN, will focus on an area in the south east of England where both networks operate, ensuring broad geographic applicability and potential for national implementation.

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

We estimate the project expenditure to be £663,208 of which £596,887 (90%) will be recovered from NIA expenditure with the split across funding licensees as follows:

- UK Power Networks – £280,447
- NESO – £76,500
- SGN – £239,940

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 will facilitate the energy system transition by enhancing data sharing, improving forecasting, fostering whole systems collaboration, and supporting industrial decarbonisation. By developing robust data-sharing agreements and infrastructure between project partners, Indus 2.0 ensures comprehensive and accurate industrial energy consumption data will be available for informed decision-making. It will create detailed industrial decarbonisation routes and integrate them into demand forecasts and planning for future energy needs.

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

N/A

Requirement 2 / 2b

Has the potential to deliver net benefits to consumers

Project must have the potential to deliver a Solution that delivers a net benefit to consumers of the Gas Transporter and/or Electricity Transmission or Electricity Distribution licensee, as the context requires. This could include delivering a Solution at a lower cost than the most efficient Method currently in use on the GB Gas Transportation System, the Gas Transporter's and/or Electricity Transmission or Electricity Distribution licensee's network, or wider benefits, such as social or environmental.

Please provide an estimate of the saving if the Problem is solved (RIIO-1 projects only)

N/A

Please provide a calculation of the expected benefits the Solution

The project is a TRL 2 research project and in accordance with the NIA governance document, does not require a benefits calculation.

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

If successful, the project partners would look to use the data sharing agreements and scale the approach with other network licensees. For example, UK Power Networks could scale with Cadent as the other GDN operating in its licence areas. This work will also help inform NESO and also support them with their Regional Energy System Plans (RESPs) across all licence areas in GB.

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

This project is research based and therefore costs associated with rolling out the Method across GB are currently unknown.

Requirement 3 / 1

Involve Research, Development or Demonstration

A RIIO-1 NIA Project must have the potential to have a Direct Impact on a Network Licensee's network or the operations of the System Operator and involve the Research, Development, or Demonstration of at least one of the following (please tick which applies):

☐ A specific piece of new (i.e. unproven in GB, or where a method has been trialled outside GB the Network Licensee must justify repeating it as part of a project) equipment (including control and communications system software).

☐ A specific novel arrangement or application of existing licensee equipment (including control and/or communications systems and/or software)

☐ A specific novel operational practice directly related to the operation of the Network Licensees system

☐ A specific novel commercial arrangement

RIIO-2 Projects

☐ A specific piece of new equipment (including monitoring, control and communications systems and software)

☐ A specific piece of new technology (including analysis and modelling systems or software), in relation to which the Method is unproven

☑ A new methodology (including the identification of specific new procedures or techniques used to identify, select, process, and analyse information)

☐ A specific novel arrangement or application of existing gas transportation, electricity transmission or electricity distribution equipment, technology or methodology

☐ A specific novel operational practice directly related to the operation of the GB Gas Transportation System, electricity transmission or electricity distribution

☐ A specific novel commercial arrangement

Specific Requirements 4 / 2a

Please explain how the learning that will be generated could be used by the relevant Network Licensees

The project is currently conducting research to understand the potential options for decarbonisation for industrial customers and how both DNOs, GDNs and NESO can best support this set of customers. Post closure of the innovation project, funding partners will be better informed on how to best plan for the future energy needs in the industrial space. Both sets of network operators will be in a position to update their forecasting approaches accordingly with the information obtained through the project and findings from the stakeholder engagement with customers. These learnings can then be shared with other Network Licensees for replication of project methods and to support the decarbonisation of their industrial customers.

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.

Indus 2.0 builds on the previous SIF Round 2 Discovery and Alpha Phases led by UK Power Networks as detailed Section 3.4: Potential for new learning.

Currently, the decarbonisation of industry has not been addressed as a whole-systems solution, with efforts largely focused on either hydrogen or electrification by individual networks. This makes it crucial to move forward with comprehensive industrial mapping and the development of decarbonisation routes for each industry, in collaboration between gas and electricity networks to ensure a coordinated approach.

If applicable, justify why you are undertaking a Project similar to those being carried out by any other Network Licensees.

Since the approval of the initial SIF-funded Indus project, there is a SIF Discovery Phase project called RIDES (Rural Industrial Decarbonisation Support) in progress which is focused on supporting the decarbonisation of rural industrial and commercial customers in particular. This project is led by SSEN. The Indus 2.0 project will collaborate with this project and ensure that the joint scopes do not lead to duplication of work.

Additional Governance And Document Upload

Please identify why the project is innovative and has not been tried before

Indus 2.0 is innovative because data sharing between networks does not happen to the extent outlined by the project. Similarly, collaboration between these networks is required to identify decarbonisation routes for industrial customers using a whole systems lens and will enable improved support for their decarbonisation journeys.

Relevant Foreground IPR

The outputs and deliverables produced as part of the project will conform to the default treatment of IPR. The foreground IPR will be comprised of the following:

- Data sharing agreements reached between project partners.
- A suitable method for data sharing between project partners.
- Decarbonisation routes for several industrial sectors.
- The learnings gained from engagement with industrial customers.

Data Access Details

UK Power Networks recognises that Innovation projects may produce network and consumption data, and that this data may be useful to others. This data may be shared with interested parties, whenever it is practicable and legal to do so, and it is in the interest of GB electricity customers. In accordance with the Innovation Data-Sharing Policy, UK Power Networks aim to make available all non-personal, non-confidential/ non-sensitive data on request, so that interested parties can benefit from this data.

To view the full Innovation Data-Sharing Policy, please visit UK Power Networks' website here to access it

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

The Network Licensees are not funding the project as part of business as usual activities for the following reasons:

- **Innovative Nature:** The project involves the application of new technologies and methodologies that are not currently used in the funding parties' standard operations. It includes research with uncertain outcomes, which are not typically covered under routine business activities. There will also be a dependence on identifying sufficient data to support the proposed industrial decarbonisation routes for industrial customers.
- **Technical and Operational Risks:** The project carries technical and operational risks, including the integration of new data-sharing solutions and the development of detailed decarbonisation routes. The research insights may not be sufficient to support updating of network operator energy demand forecasting methods. The project has an unproven business case therefore introducing a degree of risk that warrants a targeted research project to demonstrate its effectiveness. This level of uncertainty is not supported by business as usual funding.
- **Commercial Risks:** The development of data sharing infrastructure introduces a degree of commercial risk.

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

As noted in the NIA guidance, certain projects are speculative in nature and yield uncertain commercial returns. This is the case for this project. There is a commercial risk that the solution developed as part of the project is not adopted by the stakeholders involved following the trial period. This could be due to the fact that the solution has not reach the level of maturity required for business-as-usual application, or due to stakeholder sentiment. This risk is being mitigated against through early engagement with stakeholders and ensuring requirements are clearly defined and documented. If the project is successful, it will have proven a number of technical solutions and business processes which will improve customer service. The specific details regarding the benefits are captured earlier in this document.

This project has been approved by a senior member of staff

☑ Yes