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

Aug 2025

Project Reference Number

NIA_SPEN_0117

Project Registration

Project Title

Net Zero Industrial Pathways (NZIP)

Project Reference Number

NIA_SPEN_0117

Project Licensee(s)

SP Energy Networks Distribution

Project Start

August 2025

Project Duration

1 year and 6 months

Nominated Project Contact(s)

Parham Momeni

Project Budget

£325,000.00

Summary

NZIP represents a strategic expansion of the successful North-East Wales Industrial Decarbonisation (NEWID) approach, scaling it across SPEN's entire licence area—including Scotland, England, and North Wales. This project will, for the first time, deliver a whole energy system view of future industrial decarbonisation requirements, directly addressing a critical gap in SPEN's ED3 planning process. By engaging with key regional stakeholders, NZIP will generate robust, data-driven pathways that complement existing projections for domestic and transport energy demand. NZIP will provide essential intelligence to inform investment decisions and support SPEN's transition to a net zero energy system.

Third Party Collaborators

Net Zero Energy Systems

Nominated Contact Email Address(es)

innovate@spenergynetworks.co.uk

Problem Being Solved

Industrial and commercial energy demand accounts for nearly 50% of total energy consumption across North Wales, the Northwest of England, and central Scotland—key regions within SPEN's UK operating area. Unlike domestic and transport energy demand, which is widely distributed across millions of homes and vehicles, industrial demand is concentrated among a relatively small number of stakeholders. This concentration renders traditional modelling based approaches— e.g. based on technology adoption rates for EVs and heat pumps—insufficient for accurately forecasting future industrial energy needs as the sector seeks to transition to net zero.

The North-East Wales Industrial Decarbonisation (NEWID) project, funded by DESNZ through the Local Industrial Decarbonisation

Plan (LIDP) competition which was managed by Innovate UK, established a whole energy system approach to mapping future infrastructure requirements for industry in North Wales. While NEWID successfully addressed critical data gaps and provided valuable insights, its scope was limited to a small portion of SPEN's licence area, leaving uncertainty about the broader applicability of its methodology.

The Net Zero Industrial Pathways (NZIP) project aims to develop the NEWID approach across all SPEN licence areas, including Scotland, the Northwest of England, and North Wales. NZIP will collaborate with regional stakeholders to develop comprehensive industrial decarbonisation pathways, integrating whole energy system perspectives and supplementing existing models focused on domestic and transport demand.

NZIP will generate critical inputs for SPEN's ED3 planning process and provide a replicable framework for other distribution network operators. The outputs will support national industrial decarbonisation efforts and be shared with the wider energy sector to enable broader application across the GB energy system.

Method(s)

It is proposed that NZIP will cover all SPEN's operating areas and be delivered in two stages:

1. Phase 1 will be delivered in 2025 and will focus on generating estimated inputs to a draft ED3 plan for key industrial stakeholders based upon published corporate aspirations and typical decarbonisation requirements for industrial sub-sectors based upon learnings from the NEWID project. Initial engagement with the most significant industrial stakeholders and geographical areas within SPEN's operating area will also be undertaken to support progression of Phase 2.
2. Phase 2 will be delivered in 2026 and will involve engagement with key industrial stakeholders to incorporate their decarbonisation plans into the ED3 plan.

NZIP aims to develop a methodology to identify industrial stakeholder demand and emission profiling which is appropriate to apply across all SPEN's operating area and in doing so, generate industrial inputs to SPEN's draft and final ED3 plans and annual 2026 and 2027 DFES publications.

The project scope also aligns and supports Ofgem's proposals of including strategic and anticipatory investment within ED3 by engaging with stakeholders and understanding future infrastructure requirements.

Scope

The sequence of key project activities is envisaged to remain similar for both project phases with the activities anticipated to be required to progress project delivery from inception to completion outlined in the below activities:

Regional Stakeholder Screening and Prioritisation:
Preliminary screening and prioritisation of industrial stakeholder engagement will be undertaken based upon identification of key industrial sites from the large point emitter dataset published by the UK government as part of the National Atmospheric Emissions Inventory. Supplemented by consideration of prioritisation within the geographical areas where GSP and BSP sites are most constrained within SPEN's operating area.

Key Contact Development:
Building on SPEN's existing industrial contacts and connections, local industrial groups and trade associations will be leveraged to support engagement with identified key industrial stakeholders.

Initial Key Stakeholder Contact:
The stakeholder engagement approach will be based upon the method established by the NEWID project: Implementing a two-stage process to initially engage with identified stakeholders to firstly explain the project objectives and obtain their agreement to engagement. Followed by a second stage engagement to undertake the core data gathering activity for the project.

Key Industrial Site Stakeholder Net Zero Profiling:
Present day energy mapping followed by net zero profiling will be undertaken for each industrial site which engages and participates in the project. Taking a whole energy system approach helps provide a number of advantages from a project focused on a single decarbonisation vector: The proposed method will not only help accurately define the range in future energy demand at each site for decarbonisation vectors such as electrification and hydrogen fuel switching but can also potentially provide initial indication of the probability that one site decarbonisation solution might be preferred over another: helping enhance any subsequent submissions made to Ofgem in support of pre-emptive infrastructure investment.

Regional Industrial Decarbonisation Pathway Assessment:
Aggregation of net zero profiles for regional industrial sites based upon the engagement with the identified key industrial stakeholders enables an envelope of regional industrial decarbonisation pathway scenarios to be generated with the intention of comprehensively

describing the range of decarbonisation infrastructure which would be required to facilitate delivery of net zero industrial GHG emissions along with associated timescales. Focused particularly on electricity infrastructure for the NZIP project, but with cognisance of potential alternative decarbonisation pathways and energy infrastructure requirements.

Electricity T&D Network Assessment:
Developed geographically based regional industrial decarbonisation pathways will be related to SPEN network supply points to support the inclusion of future industrial electricity and electrification demand within the performance of the wider network assessment work undertaken to generate SPEN's draft and final ED3 planning documents and 2026 and 2027 DFES publications.

Draft and Final ED3 Plan and DFES Updates
As the last stage in the project process, the output from the industrial stakeholder engagement and site energy profiling work will be to incorporate the output from the project activity into the draft and final ED3 plans and annual DFES updates for 2026 and 2027 along with inputs generated from other sources using existing data production processes and guideline frameworks – e.g. profiling the anticipated uptake of LCTs.

Objective(s)

- Identification of key industrial stakeholders within SPD and SPM operating areas
- Develop industrial decarbonisation profiling to anticipate aggregated future regional electricity demand for large industrial stakeholders
- Develop methodology to identify industrial stakeholder demand and emission profiling
- Develop regional industrial decarbonisation pathway scenarios

Consumer Vulnerability Impact Assessment

The identification of electricity infrastructure requirements to support the largest regional industrial energy users transition to net zero can potentially support least cost incremental capacity increases to help other consumers, including the most vulnerable consumers to reduce their reliance on fossil fuels at a lower cost than if focusing on domestic consumers alone.

Success Criteria

1. Regional Stakeholder Screening
   - Successfully categorised and geographically mapping of industrial stakeholders
2. Industrial Demand Data Methodology
   - Methodology successfully developed to calculate require inputs from industrial stakeholders
   - Required data obtained from industrial stakeholders
3. Regional Industrial Decarbonisation Pathways
   - Industrial decarbonisation scenarios mapped and aligned with SPENs DFES future scenarios

Project Partners and External Funding

Net Zero Energy Systems – Industrial stakeholder engagement and industrial pathway scenario modelling.

Potential for New Learning

As outlined in the problem statement, NZIP will look to develop a methodology to successfully forecast industrial decarbonisation scenarios. By understanding industrial demand profiles and potential decarbonisation scenarios, the project will provide essential insight to inform future forecasts and investment decisions.

The project will enhance DNOs understanding of industrial demand profiles and provide additional evidence for future forecasts. Learnings will be disseminated through the NIA closedown report.

Scale of Project

The project will focus on key industrial sites from the large point emitter dataset published by the UK government as part of the National Atmospheric Emissions Inventory which are sufficiently large as to be mandated to report their emissions under the UK ETS – i.e. operational sites which are above the 2.5 kTPA industrial GHG emissions threshold. Supplemented by consideration of prioritisation within the geographical areas where GSP and BSP sites are most constrained within SPEN's operating area. This approach will ultimately ensure the methodology developed through NEWID is scalable and appropriate to replicate to the wider GB network.

Technology Readiness at Start

Technology Readiness at End

TRL4 Bench Scale Research

TRL5 Pilot Scale

Geographical Area

SPD/SPM Licence Areas.

Revenue Allowed for the RIIO Settlement

N/A

Indicative Total NIA Project Expenditure

£325,000

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 project will look to develop regional industrial decarbonisation pathway scenarios and identify the range of decarbonisation infrastructure that would be required to facilitate delivery of net zero industrial GHG emissions. The scenarios will be incorporated into SPENs DFES methodology and therefore help facilitate the energy system transition by providing more accurate forecasts for future demand.

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

N/A - RIIO-2 funded project.

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

Greater confidence in forecasts with stakeholder driven evidence. Present day energy mapping followed by net zero profiling will be undertaken for each industrial site which engages and participates in the project. The proposed method will not only help accurately define the range in future energy demand at each site for decarbonisation vectors such as electrification and hydrogen fuel switching but can also potentially provide initial indication of probability that one site decarbonisation solution might be preferred over another.

Drives investment, factoring in local ambition. By capturing industrial decarbonisation pathway scenarios, this could support £6-20m of ED3 investment. This value has been estimated based on the output of NEWID and the anticipated benefits as a result of the information obtained within the project. Distribution and Transmission network assessments will develop geographically based regional industrial decarbonisation pathways, relating to SPENs network supply points to support the inclusion of future industrial electricity and electrification demand with the performance of the wider network assessment work undertaken to generate SPEN's draft and final ED3 planning document and 2026/27 DFES publications.

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

The methodology developed through the project will be replicable across all other Network Licensees.

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

Due to the wide variation of industrial sites across each network area, we are unable to provide details of costs to rollout the method across GB.

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

Generated learnings will provide network licenses with a replicable methodology to identify key industrial stakeholders and develop regional industrial decarbonisation pathway assessments.

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. 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.

We have engaged with other Distribution Network Operators (DNOs) to ensure that a similar project is not being undertaken elsewhere.

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

Unlike domestic and transport energy demand, which is widely distributed across millions of homes and vehicles, industrial demand is concentrated among a relatively small number of major stakeholders. This concentration renders traditional modelling approaches—based on technology adoption rates for EVs and heat pumps—insufficient for accurately forecasting future industrial energy needs.

The North-East Wales Industrial Decarbonisation (NEWID) project, funded by DESNZ under the LIDP competition and managed by Innovate UK, established a whole energy system approach to mapping future infrastructure requirements for industry in North Wales. While NEWID successfully addressed critical data gaps and provided valuable insights, its scope was limited to a small portion of

SPEN's licence area, leaving uncertainty about the broader applicability of its methodology.

The NZIP project aims to scale the NEWID approach across all SPEN licence areas, including Scotland, the Northwest of England, and North Wales. The project will also explore innovative modelling techniques and data integration strategies, drawing on insight from other innovation projects. This will enable a more dynamic and system wide understanding of industrial energy transitions.

Relevant Foreground IPR

Foreground IPR that will be generated in the project includes the methodology for identifying and forecasting industrial decarbonisation scenarios, which will be made available in the project report.

Data Access Details

The provision of data is subject to anonymisation and/or redaction for reasons of commercial confidentiality or other sensitivity.

Access to this data must be requested by contacting Innovation@spenergynetworks.co.uk. Please provide the following information in your request:

- Affiliation, position and contact details of requesting party
- Relevant project and type of data required
- Reasons for requesting this data and evidence that this data will be used in the interest of the UK network electricity customers
- How data will be shared internally and externally by the requesting party

Any data request deemed unsuitable for sharing will be highlighted to the appropriate requesting party. After receiving the request we will provide the estimated date for completing the data provision based on other requests and our team workload at that time. All requested data remains the property of SP Energy Networks.

https://www.spenergynetworks.co.uk/pages/data_sharing_policy.aspx

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

Funding this project through innovation ensures industrial demand data can more accurately be forecasted within SPENs ED3 business plan and therefore support industrial decarbonisation strategies.

This project cannot be carried out through BaU as the methodology to identify and profile industrial demand to achieve net zero in the industrial sector does not currently exist and therefore the approach requires validation through innovation before this can be adopted.

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

NIA funding is required to develop the required methodology to identify and profile industrial demand data. This would not be feasible under BaU activities due the reasons outlined above.

This project has been approved by a senior member of staff

☑ Yes