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

### Project Reference Number

NIA_SPEN_0070

## Project Registration

### Project Title

Asset Reuse and Recovery Collaboration (ARRC) - Discovery Continuity

### Project Reference Number

NIA_SPEN_0070

### Project Licensee(s)

SP Energy Networks Distribution

### Project Start

February 2022

### Project Duration

0 years and 11 months

### Nominated Project Contact(s)

Claire Roxburgh

### Project Budget

£150,000.00

### Summary

Asset Reuse and Recovery Collaboration (ARRC) - Discovery Continuity will investigate the environmental and cost impacts both high value and high volume assets across electricity generation, transmission and distribution and consider current procurement, commissioning, use, and disposal practices. This project will establish different successful methodologies to extend asset life using circular economy principles with the aim to inform small and large scale demonstrations at later phases.

This project is in place to safeguard the delivery and continuity of the associated SIF project.

### Nominated Contact Email Address(es)

innovate@spenergynetworks.co.uk

### Problem Being Solved

UK Energy system infrastructure consists of thousands of high-value assets at varying stages in their useful lifetime. To transition to meet future energy demands and net zero carbon, record levels of investment in new energy infrastructure continue to be required.

At every stage of the infrastructure life cycle, there are significant environmental and financial costs, from the embodied carbon in manufacturing and transport to the impacts of operational use and end of life disposal. These impacts are not always well-understood by infrastructure owners resulting in investment decisions being made without cognisence of whole life costs. This results in avoidable carbon emissions, due to the scale of this infrastructure across the UK, and indeed across the globe, this is a significant contributory factor to climate change.

Using a whole system approach to asset management and the identification and implementation of innovative circular solutions, this project, and its future phases, aims to extend the life of assets, keeping resources in use for as long as possible, providing significant environmental, cost and network resilience benefits. There is a clear opportunity to ensure that spend on new infrastructure assets are informed by a robust understanding of environmental and cost data around manufacture, transport, use, and disposal.

## Method(s)

A desktop feasibility study to evaulate the environmental and cost impact of high value assets throughout their life and investigate opportunities to apply circular economic principles to reuse, repurpose, refurbish, repair, remanufacture, redeploy or recycle assets.

## Scope

- Supporting SIF discovery commencement through additional data gathering, formatting, reviewing and validation
- Support and accelerate the transition to SIF alpha

## Objective(s)

- Maximise the success of discovery by feeding in additional data gathering, formatting, reviewing and validation to inform the SIF outcomes

## Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

N/A awaiting tool.

No impact has been identified that would cause adversity to any consumer vulnerability group (based on the PSR definition)

## Success Criteria

Maximise the success of discovery by feeding in additional data gathering, formatting, reviewing and validation to inform the SIF outcomes

## Project Partners and External Funding

This project brings together transmission and distribution network operators, and electricity generation companies, namely **SP Transmission**, **SSE Transmission**, **SP Distribution** and **SP Renewables**. These core project partners will be the initial users of the innovation, implementing the identified opportunities for extending the life of assets and providing a clear route to market.

**Frazer-Nash Consultancy** are the expert delivery partner. Frazer-Nash is a leading systems and engineering technology company with extensive expertise in energy infrastructure asset management.

**BEAMA** (the UK trade association for manufacturers and providers of energy infrastructure technologies and systems) are the final partner, providing expertise on the design and manufacture of assets.

This project is in place to safeguard the delivery and continuity of the associated SIF project.

## Potential for New Learning

This project will provide learning on circular economy practices, and their practical applications for high value industry assets.

## Scale of Project

ARRC - Discovery Continuity facilitates a small-scale feasibility study and CBA, which will inform both a small-scale and a large-scale demonstration. The roadmap and circular economy solutions generated by this project and future phases will potentially have uses beyond the energy sector. Other major infrastructure users (major engineering companies, Network Rail, manufacturers) face similar challenges of reducing embodied carbon in infrastructure. We will work with infrastructure collaboration bodies such as MIROG (Major Infrastructure Resource Optimisation Group) and SICEF (Scottish Infrastructure Circular Economy Forum) to develop a strategy to build awareness of this work and share learnings via case studies, presentations, publications, and websites, and share the tools to deliver savings with other interested organisations. Where tools are developed to aid impact assessment or the exchange of resources these will be made available for others to use.

## Technology Readiness at Start

TRL3 Proof of Concept

## Technology Readiness at End

TRL4 Bench Scale Research

## Geographical Area

N/A

## Revenue Allowed for the RIIO Settlement

None

## Indicative Total NIA Project Expenditure

£150,000

# 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 energy system is transitioning to a net zero future. The circular economic principles central to the ARRC Project promote low carbon business practices by refurbishing, repairing, retrofitting, remanufacturing and repurposing high value assets in the energy industry. From the materials procured and used, to the way we dispose of our assets, carbon emissions should be a focus. ARRC will investigate how to design and manufacture in a more sustainable way, as well as how assets can be useful at the end of the expected lifecycle through repair, reuse or redeployment to avoid assets going to landfill. This project will allow networks to approach their assets from a new perspective, where carbon reduction can be a focus from manufacture, through use, to disposal in order to facilitate the energy system transition.

## 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

This is a research-based project. Benefits will be quantified throughout the project.

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

The findings from this project will facilitate solutions that can be implemented nationwide, both in the energy sector and in all other sectors with high value assets.

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

This is a research-based project. Roll out costs will be quantified throughout the project.

## 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 circular economic solutions identified in this project will be key to making our high value assets more environmentally friendly, something which is crucial to all network licencees.

### Or, please describe what specific challenge identified in the Network Licensee's innovation strategy that is being addressed by the project (RIIO-1 only)

N/A

### Is the default IPR position being applied?

☑ Yes

## Project Eligibility Assessment Part 2

### Not lead to unnecessary duplication

A Project must not lead to unnecessary duplication of any other Project, including but not limited to IFI, LCNF, NIA, NIC or SIF projects already registered, being carried out or completed.

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

This project is in place to safeguard the delivery and continuity of the associated SIF project.

As part of our project development, we have reviewed published results from UK and international projects. This review included the ENA smarter networks portal, the UKRI portal, and a wider review based on internet search engines and the relevant project knowledge of our project partners.

The most closely aligned previous project was the 2016 Network Innovation Allowance (NIA) funded project ‘Resource and Asset Reuse Toolkit’, which developed an internal resource sharing tool within an Electricity Transmission company. Our assessment of this project has identified that impact was limited due to several key factors, such as a lack of whole-system participation, and policy and regulatory adaptations.

### 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

This project is in place to safeguard the delivery and continuity of the associated SIF project. This is the first project to investigate

circular economic principles applied to high value assets in the energy sector.

## Relevant Foreground IPR

The specific Relevant Foreground IPR is unknown for this project phase due to it being a feasibility study. If the project is successful and progresses to futher phases where the identified optimal solution is being developed, Relevant Foreground IPR will be identified and reported.

## Data Access Details

Access to this data must be requested by contacting SPInnovation@spenergynetworks.com 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.

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

There is no allowance within the SP Transmission RIIO-2 business as usual funding that is appropriate to fund this innovation project.

## Please identify why the project can only be undertaken with the support of the NIA, including reference to the specific risks(e.g. commercial, technical, operational or regulatory) associated with the project

The project has both technical and commercial risks including the availability of relevant data and developing a solution that is at least cost to the consumer. Due to the early TRL, the success of the project and associated financial benefits of the project cannot be determined at this stage therefore it can only be undertaken with the support of NIA. This NIA is in place to meet all user requirements of the SIF scope and to derisk the delivery.

## This project has been approved by a senior member of staff

☐ Yes