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

Jul 2016

### Project Reference Number

NIA_ENWL017

## Project Registration

### Project Title

Electricity and heat

### Project Reference Number

NIA_ENWL017

### Project Licensee(s)

Electricity North West

### Project Start

July 2016

### Project Duration

3 years and 1 month

### Nominated Project Contact(s)

Electricity North West Innovation Team

### Project Budget

£990,000.00

### Summary

The project will be conducted at a single location and help understand how benefits for a Distribution Network Operator and their customers can be derived from improved energy management.The scope of this project includes the adaption design work required to implement technology from other sectors in a trial site.

### Third Party Collaborators

Futurebay

### Nominated Contact Email Address(es)

innovation@enwl.co.uk

### Problem Being Solved

Electricity demand will increase and change both through the adoption of low carbon technologies and general load growth; including the increased deployment of air conditioning. As traditional reinforcement to accommodate this load could be costly and disruptive, new and innovative solutions are being sought. Air conditioning systems tend to release a significant amount of heat as a by-product which is currently a wasted resource.
This project will investigate the feasibility of utilising the heat currently wasted to both improve overall energy efficiency (reducing electrical demand) and allow the electrical demand to be managed.

### Method(s)

The project will be a mixture of research and development and will investigate how an innovative way of managing energy holistically can derive benefit for a Distribution Network Operator and their customers.
The project will be split into the following phases

Phase 1. Feasibility study that identifies and undertakes a detailed review of a trial site producing waste heat to investigate how the heat could be used to reduce and shift the overall energy requirements of the site. This phase will include the broad outline concept design, costing and potential benefits.
Phase 2. Design and budget for installation of one unit at the trial site.
Phase 3. Build, install, monitor and analyse the system operation at the trial site.
Phase 4: Dissemination of learning.

## Scope

The project will be conducted at a single location and help understand how benefits for a Distribution Network Operator and their customers can be derived from improved energy management.
The scope of this project includes the adaption design work required to implement technology from other sectors in a trial site.

## Objective(s)

This project has 4 primary objectives.
1. A trial installation to assess impact and opportunities for a GB DNO.
2. To determine the capability of the technology to assist in overall energy management.
3. To quantify the impact on metered energy consumption at the trial site.
4. To investigate the impact on timing of energy consumption at the trial site.
Achieving these objectives will support network operators in releasing network capacity for use by customers, particularly in areas of high and increasing demand.

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

n/a

## Success Criteria

This project will be considered a success upon
1. A trial site being identified
2. The trial site being adapted such that sufficient monitoring and data is available to quantify potential cost and benefits
3. Production and publication of a report to disseminate the findings.

## Project Partners and External Funding

Futurebay, an energy technology provider will Partner on this project .

## Potential for New Learning

The project has potential for learning through understanding the potential for utilising accessible waste energy to both reduce overall electrical load on the distribution network and to modify the electrical load requirements thereby assist in addressing peak load constraints.
The learning generated will be relevant to other DNOs as it addresses a common problem experienced on generic distribution network types.

## Scale of Project

One trial site, which will be sufficient to demonstrate the flexibility and assess the potential benefit of this approach.

## Technology Readiness at Start

TRL2 Invention and Research

## Technology Readiness at End

TRL5 Pilot Scale

## Geographical Area

North West of England

## Revenue Allowed for the RIIO Settlement

None

## Indicative Total NIA Project Expenditure

545 000

# 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:

n/a

## 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)

This is a research to development project and as such it is not possible to estimate savings at this point. However recycling or repurposing waste heat could deliver energy system efficiencies and avoid reinforcement.

## Please provide a calculation of the expected benefits the Solution

N/a

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

If successful, the technology could be applied at any location that currently generates significant waste heat.

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

There is no rollout cost calculation available at present.

## 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

Outputs, including raw monitoring data and a report outlining findings from the project will be made available to all Network Operators. This learning can be used to understand the potential of using waste heat to reduce energy consumption and modify electrical demand hence delivering capacity at least cost to electricity 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)

Our innovation strategy identifies six key innovation themes. This project has the potential to address challenges under four of those six themes; capacity, efficiency, customer service and commercial evolution.
If successful, this technique will enable us to maximize the use of existing assets whilst providing existing services at lower cost through avoidance of reinforcement. In addition, the technology, when proven, will be commercially available to customers enabling them to take advantage of new market opportunities and a wider choice of connection agreements.

☑ Has the Potential to Develop Learning That Can be Applied by all Relevant Network Licensees

### 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.

A review of the smarter networks portal has not revealed any projects in this area.

### 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

n/a

### Relevant Foreground IPR

n/a

### Data Access Details

n/a

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

n/a

## 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

n/a

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

☑ Yes