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

Feb 2015

Project Reference Number

NIA_SSEPD_0001

Project Registration

Project Title

DISCERN Knowledge Transfer

Project Reference Number

NIA_SSEPD_0001

Project Licensee(s)

Scottish and Southern Electricity Networks Distribution

Project Start

February 2013

Project Duration

3 years and 4 months

Nominated Project Contact(s)

SSEN Future Networks Team

Project Budget

£100,026.00

Summary

This IFI/NIA DISCERN Knowledge Transfer project lasts for 3 years to mirror the duration of the FP7 DISCERN project.

The IFI/NIA project facilitates SEPD's participation as a partner in the FP7 DISCERN project, providing access to the significant resources provided by the project participants themselves and the broad range of solutions implemented by DSO/DNOs in their demonstration site projects, with SEPD's participation drawing on the NTVV project.

Various monitoring systems, including communications and algorithms, have already been installed at the demonstration site locations within the DSO/DNO participant networks and further additional installations will be undertaken within the scope of DISCERN. The FP7 DISCERN project will build on these implementations by collating information on the systems and devices used, investigating the replicability and scalability of the solutions implemented, developing an understanding of optimal solutions, investigating the associated costs, making recommendations and providing communication tools to facilitate replicability of the solutions.

SEPD's role is to provide data and information, inform project direction, and contribute to the development and review of project outputs. Rather than funding the installation of hardware, the IFI/NIA funding facilitates this participation.

Third Party Collaborators

Iberdrola

RWE

Unión Fenosa Distribución

Vattenfall

ABB Group

ZIV Automation

DNV

CIRCET

KTH Institute of Technology

OFFIS

Nominated Contact Email Address(es)

fnp.pmo@sse.com

Problem Being Solved

It is the aim of the European FP7 DISCERN (Distributed Intelligence for Cost-Effective and Reliable Distribution Network Operation) collaborative project to assess the optimal level of intelligence in the distribution network and to determine the technological options that will allow cost-effective and reliable observability and controllability of the future distribution networks in Europe on a replicable and scalable basis.

DISCERN draws together a number of projects, each looking at different Smart Grid functionalities, to assess technical and architectural approaches and develop effective recommendations and solutions for application on electricity distribution networks on a business as usual basis.

NIA funding will not be used for hardware installation. Rather, the project leverages learning from the LCNF Tier 2 New Thames Valley Vision (NTVV) project through the FP7 DISCERN project to gain additional learning from European partner projects on a broader range of Smart Grid functionalities. This extended information and experience will strengthen learning from the NTVV project, thereby increasing learning for all GB DNOs.

Method(s)

The £250k IFI/NIA project facilitates SEPD's participation in the £6.3m European FP7 DISCERN project, for which over 50% is funded from the European Commission; with the remaining costs being met by DISCERN project partners. SEPD's participation in the FP7 DISCERN project provides access to the significant resources provided by the project partners themselves and the broad range of solutions implemented by DSO/DNOs in their demonstration site projects.

In keeping with the preceding IFI project, this NIA project is focused on Knowledge Transfer. By participating in DISCERN, SEPD has and will continue to leverage greater understanding from a broad range of external projects and benefit from shared experience and expertise, drawing knowledge from across Europe.

The European FP7 DISCERN project consortium comprises five major DSO/DNOs, technology providers, research institutes and technical consultancy. The collaboration builds on five demonstration projects operated by the DSO/DNOs, who are each similarly contributing to the DISCERN project. The associated demonstration site projects use a range of innovative technological approaches to achieve differing Smart Grid functionalities which address different challenges.

The project focuses on a refined list of the Smart Grid sub-functionalities that form the high-level Smart Grid services defined by EU Commission Smart Grid Task Force. Each partner DSO takes on a role of Leader, Learner or Listener with regard to each of these sub-functionalities, referred to as the '3L' approach, with roles defined as follows:

• Leading DSOs bring their experience of solutions that have already been implemented to investigate a specific Smart Grid sub-functionality - SEPD is a Leader for the monitoring sub-functionality, drawing on the NTVV project
• Learning DSOs will implement a new technical solution for a sub-functionality within DISCERN
• Listening DSOs will observe findings relating to sub-functionalities that they wish to gain knowledge on but for which they have not yet implemented a solution - SEPD is a Listener for other sub-functionalities under consideration

The sub-functionalities under consideration within DISCERN are:

B6 Enhanced monitoring and control of MV/LV network - SEPD role as Listener
B7bd Real time monitoring of LV grid - SEPD role as Leader
B9a Optimized AMR data collection and analysis using virtualised as well as physical concentrators
B9b Calculation and separation of non-technical losses - SEPD role as Listener
C12b Aggregating flexible loads for power flow control and congestion management - SEPD role as Listener

C12c Use of flexible storage for power flow control ancillary service - SEPD role as Listener

To allow demonstration site solutions to be compared and communicated between partners, both Leader and Learner solutions are documented using tools developed within the FP7 DISCERN project to facilitate use of the Use Case methodology set out in international standard IEC 62559-2, and the SGAM (Smart Grid Architectural Model) framework defined by the CEN-CENELEC-ETSI Joint Working Group for Smart Grids.

DISCERN will use the data and information available from partners and demonstration sites to undertake a range of investigations, studies, modelling simulations and assessments through a series of Work Packages. Comparative assessments, guided by the defined Key Performance Indicators, will evaluate the range of technological options, solutions and operational processes considered within the project. Factors affecting the Replicability and Scalability of the solutions in different network contexts will be assessed, and commercial and regulatory aspects will be considered, leading to the development of recommendations for replicable and scalable solutions. Further, simulations will be undertaken by project partners using models of SEPD network areas to investigate the specific application of technologies to SEPD networks in a simulation environment.

Data from the NTVV project provides input to the FP7 DISCERN project, with knowledge and experience contributed by means of workshops, structured questionnaires, interviews and reports. As with other DSO project partners, SEPD will contribute information relating to technological, operational, financial and regulatory issues, requiring the collation of DISCERN relevant data and coordination of activities of experts from across the business.

This NIA project will facilitate both the coordination and contribution of data and information to the main DISCERN project across the full suite of DISCERN Work Packages, as well as the development and review of the methodologies to be applied and the project conclusions and outputs to be delivered. Such participation will ensure that direct benefits can be obtained in terms of additional research beyond that occurring within the NTVV project, and that the broader findings of the FP7 DISCERN project are available to us for dissemination internally and to the wider UK industry.

Scope

This IFI/NIA DISCERN Knowledge Transfer project lasts for 3 years to mirror the duration of the FP7 DISCERN project.

The IFI/NIA project facilitates SEPD's participation as a partner in the FP7 DISCERN project, providing access to the significant resources provided by the project participants themselves and the broad range of solutions implemented by DSO/DNOs in their demonstration site projects, with SEPD's participation drawing on the NTVV project.

Various monitoring systems, including communications and algorithms, have already been installed at the demonstration site locations within the DSO/DNO participant networks and further additional installations will be undertaken within the scope of DISCERN. The FP7 DISCERN project will build on these implementations by collating information on the systems and devices used, investigating the replicability and scalability of the solutions implemented, developing an understanding of optimal solutions, investigating the associated costs, making recommendations and providing communication tools to facilitate replicability of the solutions.

SEPD's role is to provide data and information, inform project direction, and contribute to the development and review of project outputs. Rather than funding the installation of hardware, the IFI/NIA funding facilitates this participation.

This NIA project has been extended to April 2016 to match an extension to the FP7 DISCERN project as approved by the European Commission. This will allow completion of the demonstration projects of DISCERN partners by January, with three months for third party printing of the final reporting material and organisation of the final dissemination event. The additional months will cover activities under the 'Dissemination' and 'Project Management' Work Packages, which are solely funded by the EC, with no associated NIA funding. There are no changes to the planned project activities, nor any impact on the associated expenditure.

Objective(s)

The objectives of SEPD's participation in DISCERN are:

• Knowledge relating to a range of Smart Grid sub-functionalities obtained from other partners' research & demonstration sites and from simulations, provided through DISCERN deliverables and simulation outputs
• Increased understanding of how much intelligence to incorporate on a distribution network and the replicability & scalability of solutions across different networks, provided through DISCERN deliverables and simulation outputs
• Development and experience of implementing Use Case & SGAM methodologies and related design tools such that these can be applied within the business beyond DISCERN use and contribution can be made to GB industry discussions on SGAM use; development and experience of implementing a comprehensive semantic model
• Representation of GB DNO interests within the European FP7 project, provision of GB relevant networks for simulation modeling,

and feeding relevant developments and information on the direction of work undertaken in Europe to GB industry bodies

Consumer Vulnerability Impact Assessment (RIIO-2 Projects Only)

n/a

Success Criteria

The DISCERN Knowledge Transfer project will be considered successful when:

• studies and research directly relevant to SEPD, which is beyond the scope of areas to be addressed within NTVV, is made available for incorporation into both business and innovation strategic thinking
• knowledge relating to a range of Smart Grid sub-functionalities not yet being investigated within the business is made available from other FP7 DISCERN partners' research & demonstration sites and from simulations, supporting decisions on how networks are built, managed and operated
• knowledge of such factors as systems architecture, Use Cases & SGAM, semantic models and CIM, is improved across operational and innovation areas of the business, as well as ICT, such that it is possible to take a view on the potential development, relevance and applicability of such approaches within the business from a BAU perspective
• SEPD has successfully met all of its obligations as a project partner to the FP7 DISCERN project, and ensured that project outputs do not go against GB interests, specifically those forming recommendations to standards authorities

Project Partners and External Funding

n/a

Potential for New Learning

n/a

Scale of Project

For SEPD to be accepted for participation within the FP7 DISCERN project, it was required that we are able to contribute fully to the project and meet all participation obligations as set out by EU requirements. It would not have been possible for us to participate in the project and received the benefits of doing so with any smaller input. NIA project costs are minimised by using teleconference facilities rather than face to face meetings as far as possible.

Technology Readiness at Start

TRL3 Proof of Concept

Technology Readiness at End

TRL5 Pilot Scale

Geographical Area

~As this NIA project is focussed on knowledge transfer, the majority of the work required for participation in DISCERN occurs in the office locations of relevant members of staff within the SEPD licence area, with some participation in project events held at locations in Europe.

Beyond the NIA work itself, the NTVV project being leveraged for DISCERN is focused on the Bracknell area of Berkshire in SEPD's license area. The FP7 DISCERN project itself comprises 5 European DSO/DNOs each contributing findings from the following Smart Grid projects:

Project Title - DSO/DNO Partner - Demonstration Site Location
Future Energy Grids - RWE - Bitburg, Germany
New Thames Valley Vision - SEPD - Bracknell, UK
PRICE - Gas Natural Fenosa and Iberdrola - Madrid and Guadalajara area, Spain
Smart Grid Gotland - Vattenfall - Gotland, Sweden
Smart Operator - RWE - Augsburg/Kisselbach, Germany

Revenue Allowed for the RIIO Settlement

At this stage no saving on expenditure can be assumed.

Indicative Total NIA Project Expenditure

Total (2015-16 NIA) = £100,026 of which 90% (£90,023.40) is Allowable NIA Expenditure

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)

The £250k IFI/NIA funding represents ~4% of the total FP7 DISCERN budget of £6.3m. This represents significant savings over the budget that would have been required to investigate the range of Smart Grid functionalities under investigation through stand alone projects. The functionalities being investigated include:

- Optimal MV network monitoring and automation - Enhanced monitoring & control of power flows & voltages
- Real time monitoring of LV grid - Enhanced monitoring and observability of network components down to LV
- Optimized AMR data collection and analysis using virtualized as well as physical concentrators
- Calculation and separation of non-technical losses
- Aggregating flexible loads for power flow control and congestion management
- Use of flexible storage for power flow control ancillary services

Please provide a calculation of the expected benefits the Solution

N/A - Research Project

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

In addition to the above, the FP7 DISCERN project includes assessment of the potential replicability and scalability of the technologies and solutions implemented by project partners with the aim of providing recommendations for the implementation or adoption of certain approaches in varying environments. This should support and inform future consideration of the roll-out of such solutions and technologies.

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

N/A - Research 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

Learning from this project will provide additional validation of internal project work which will inform decisions and recommendations to be made to other GB DNOs over the application of various additional Smart Grid functionalities to distribution networks.

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

☑ 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.

n/a

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