Date of Submission

May 2021

NIA Project Registration and PEA Document

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.

Project Registration

Project Title

TraDER

Project Reference

NIA_SSEN_0047

Project Licensee(s)

Scottish Hydro Electric Power Distribution

Project Start Date

March 2020

Project Duration

1 year and 3 months

Nominated Project Contact(s)

Peter Taddei

Project Budget

£275,000.00

Nominated Contact Email Address(es)

fnp.pmo@sse.com

Problem(s)

Present energy market design does not allow for more than one value component to be traded at once. Flexibility is not simply a service, rather a bundled set of attributes such as power, balancing implications, location, response profile and inertia. Therefore, the value of a single flexibility action should accrue to multiple parties at the same time. Existing limitations in the market design result in the procurers of flexibility being unable to share pools of liquidity or the partial costs of the flexible actions that they seek to schedule. Currently, there is not a single access point which allows for distributed energy resources to provide valuable services such as balancing, stability, and network capacity.

Method(s)

Project TraDER will both develop and trade a near real time distribution constraint product and integrate this market both horizontally (i.e. with other, longer term Distribution System Operator (DSO) products) and vertically (i.e. other trades within the same time period, such as the Balancing Mechanism). TraDER will provide a platform creating single access point, making it easier for distributed energy resources to provide valuable services such as balancing, stability, and network capacity.

In this way, "whole system value" is maximised by enabling price driven coordination between Electricity System operator (ESO), DSO and other market participants. Moreover, since the definition of "whole system value" is simply a function of the defined products in the market, it is capable of evolving over time as the market products themselves evolve. In this way, TraDER's approach is highly flexible and can be extended in later iterations..

Project TraDER will deliver a neutral market platform, the operation can either be centralised (operated by a neutral market facilitator), or decentralised (overseen by multiple governing authorities). Both the governance structure and the commercial model will be studied and determined throughout the project.

TraDER is not a dispatch platform, rather a marketplace based around the principles of self-dispatch. Moreover, TraDER is not looking to replace the residual market, rather to gradually aggregate liquidity in near real time, traded markets.

Scope

Electron, a UK based Entech company, have been appointed by BEIS to lead a consortium to develop a neutral, multi-product flexibility exchange as part of its FleX competition.

The consortium, named TraDER, brings together CGI, EdF Energy, Elexon, Energy Systems Catapult, Kaluza [an OVO company] and SSEN, alongside other key players in the emerging flexibility arena. It is looking to deliver a single access point to multiple energy services such as balancing, stability and network capacity.

SSEN's input to TraDER is funded via NIA rather than BEIS. SSEN will act as a facilitator to TraDER by enabling access to the Active Network Management (ANM) scheme currently operating in Orkney.

Objectives(s)

SSEN will act as a facilitator to TraDER by:

Delivering data from the ANM system currently operating in Orkney.
Enabling changes to the ANM system in order to execute trades created by the TraDER platform.

In return, TraDER will deliver outputs which will allow SSEN to assess the impact of –

How trades can be implemented on the ANM scheme eg. changes to Last In First Out (LIFO) connection order, and associated costs to SSEN.
Scale of the market to ensure implementation costs can be recovered by SSEN.
Allows SSEN to assess the preferred Neutral Market Facilitator (NFM) model of 3rd parties. This assessment can feed into wider DSO related projects being undertaken by SSEN

Success Criteria

The NIA project will be deemed as successful if all items in the objectives are met and provides effective support to the delivery of the larger TraDER BEIS project.

Technology Readiness Level at Start

TRL 4

Technology Readiness Level at Completion

TRL 6

Project Partners and External Funding

SSEN will formally engage with Electron who are leading the BEIS project. SSEN's contribution is fully funded by NIA.

Potential for New Learning

The project will provide valuable new learning relating to the trading of both long-term and near-real-time flexibility products, bridging the gap between traditional procurement and the evolving needs of the energy system. In addition to harmonising with existing products and services, new products addressing specific market needs will be developed as part of the project. The ultimate goal of the project is to integrate these markets in a collaborative framework which enables flexibility providers to provide simultaneous non-rival services to multiple buyers.

Scale of Project

This project is designed to get maximum learning for minimal cost and is expected to take this technology through to TRL 6 at which point solutions to the problem statement have been tested. Any smaller scale project would limit the potential for new learning.

Geographical Area

This project will be undertaken within the Scottish Hydro Electric Power Distribution licence area in Scotland.

Revenue Allowed for in the RIIO Settlement

No allowance has been made for implementing a solution such as TraDER.

Indicative Total NIA Project Expenditure

The total expenditure expected from the project is £275,000. 90% of which £247,500 is allowable NIA expenditure.

Project Eligibility Assessment

Specific Requirements 1

1a. A 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 the GB the Network Licensee must justify repeating it as part of a Project) equipment (including control and communications systems and 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 Licensee's System ☐

A specific novel commercial arrangement	X

Specific Requirements 2

2a. Has the Potential to Develop Learning That Can be Applied by all Relevant Network Licensees

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

The learning from project TraDER will allow Network Licencees to asses the potential technical and commercial impacts that peer to peer trading will create.   This learning will include the expected market scale in Orkney and wider GB network along with documented cost recovery mechanisms for Network Licensees.

2b. Is the default IPR position being applied?

Yes	X

2c. Has the Potential to Deliver Net Financial Benefits to Customers?

Yes	X

Please provide an estimate of the saving if the Problem is solved.

The project can deliver a net benefit to generators by potentially allowing generation in circumstances where they would otherwise be curtailed. The wider BEIS project, led by Electron, will provide estimates on potential savings during the course of the project and is a significant learning objective of the project.

Please provide a calculation of the expected financial benefits of a Development or Demonstration Project (not required for Research Projects). (Base Cost - Method Cost, Against Agreed Baseline).

N/A. This is a research-based project, but if successful the project will be able to provide insight into how customer savings can be achieved.

Please provide an estimate of how replicable the Method is across GB in terms of the number of sites, the sort of site the method could be applied to, or the percentage of the Network Licensees system where it could be rolled-out.

The findings from this project will be replicable across all DNOs. Learnings will be shared in order to assist with implementation.

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

The cost of rolling out will be determined by the success of the method and as a result the answer to this question will be an output from the project itself; as detailed in the project objectives. The costs will be similar to other DNOs who operate ANM systems.

2d. Does not Lead to Unnecessary Duplication

Yes	X

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

Flexibility trading markets have not yet been established within the UK. This is a first of its kind project.

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

Additional Governance Requirements

Please identify

that the project is innovative (ie not business as usual) and has an unproven business case where the risk warrants a limited Research and Development or Demonstration Project to demonstrate its effectiveness	X

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

TraDER is innovative as it will level the playing field by breaking out "flexibility" actions into more granular value components. This unique approach allows those components to be priced separately across multiple bidders or markets (e.g. location + power + balancing, or balancing + inertia). In this way, despite significant uncertainty over how much flexibility will be required and where it will come from as the energy system evolves, this market approach will allow economies of scale to compete with economies of location as assets are remunerated for the services they deliver to both networks (peak reduction, network reinforcement deferral and avoidance) and load and thus level the playing field for distribution connected assets. This approach has not been trialled previously and the outputs will provide valuable learning to larger scale DSO innovation projects.

ii) Please identify why the Network Licensee will not fund such a Project as part of its business as usual activities

No allowances have been made in the RIIO settlement for trialing technologies such as TraDER. The results from the project may change procedures and processes on how SSEN implement ANM activity. SSEN needs to fully understand the results from an extended monitoring period, to full assess the impact of widescale TraDER implementation in a business as usual application.

iii) Please identify why the Project can only be undertaken with the support of the NIA, including reference to the specific risks (eg commercial, technical, operational or regulatory) associated with the Project

There are two potential risks through which a market-based approach could fail. Firstly, the market design itself could be flawed, the consequences of which, at one extreme, would result simply in a lack of engagement and sub optimal allocation.Secondly, the platform design and implementation may have technical weaknesses that result in non-availability, unanticipated costs, cyber security failures, or market disruption. The costs to SSEN to facilitate the TraDER project and trials are significant; NIA is deemed the most suitable framework to undertake these trials, capture knowledge and disseminate the learning to other interested parties.

This project has been approved by a senior member of staff

Scottish & Southern
Electricity Networks