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Network Innovation Competition Screening Submission Pro forma

Notes on completion

Before completing this form, please refer to the relevant Network Innovation Competition (NIC) Governance Document(s).[1]
Please use default font (Verdana size 10) in your submission and retain 1.5 line spacing.
We will only accept the text visible in the text entry areas.
The text entry areas are predetermined and should not be changed.
The full-completed submission should not exceed 19 pages in total.

Ofgem will publish all the information contained within this Screening Submission.

Is the application for the Gas or Electricity NIC? If a Cross-Industry Project, please state 'Cross-Industry'.
Electricity NIC
Funding Licensee
Northern Powergrid
Project Partners including other Licensees
Electricity North West, Scottish and Southern Electricity Networks, SP Energy Networks, UK Power Networks, Western Power Distribution, ElectraLink
Project Title
Flexr: A Data Provision and Standardisation Service for DNOs and their Customers

[1] https://www.ofgem.gov.uk/publications-and-updates/version-30-network-innovation-competition-governance-documents All capitalised terms used in this document have the meaning given to them in the respective NIC Governance Document.

OFG1161

Project Summary
This Project will deliver a system (Flexr) that translates data from the GB DNOs' systems and processes into one common language through a state-of-the-art data sharing and market enablement service. Led by Northern Powergrid, and with buy-in from all GB DNOs, Flexr is a critical enabler to open data share. It will be the foundation piece of a flexible energy system, delivering a service for existing and new flexibility service providers to unlock the value that flexibility offers. This proposal takes Flexr from minimum viable product to a near-market-ready solution. Flexr will share large volumes of data in near real time, to enable joined-up operation across multiple platforms and systems. Flexr is needed now due to increased pressure for DNOs and wider energy industry participants to provide data in an accessible way, and to enable whole system approaches. Flexr will deliver: Open Portal: Flexibility market participants will register on the portal, discover triaged DNO & DER asset data (registers) & configure market reports. Line of Business integration: Delivery of an integration platform as a service (iPaaS) technology solution to all six DNOs, ensuring key data changes in the DNO estates are observed and updated on the Flexr Open Portal. Data flows are integrated with all DNOs and flexibility market participants for enabling ALL flexibility platform services. Common Flexibility Market Services: Delivery of data to enable the key flexibility market services that Ofgem has identified as enablers and accelerators of the UK flexible energy market, including procurement, settlement and despatch and control. Northern Powergrid and Partner DNOs recognise the need for a central data service that will enhance planning, forecasting, operation and energy system data-driven integration with stakeholders, which this Project will deliver. The Project will provide an enabling data provision service to facilitate the GB flexibility markets of the future by virtue of being delivered by Northern Powergrid, the DNO Partners and (DNO-owned) ElectraLink.

Estimated Start Date		**Estimated End Date**	
January 2021		December 2022	
Total Project Cost	£10m	**NIC Funding requested**	£9m
Technology Readiness Level (TRL) at start and end of project		Start: TRL 4 End: TRL 8	

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What is the Problem that the Project seeks to address?
A low carbon energy future, without intervention, is likely to be more expensive than the current situation. As the industry transitions to an interlinked "whole" energy system, where provision of transparent data between stakeholders is increasingly important, the Flexr data sharing service will result in savings to customers through improved and more immediate service provision. The DNOs operate under different data regimes and processes, with no cross-DNO nor cross-industry data sharing service or platform in place to enable data sharing across DNOs and stakeholders. Key initiatives such as RIIO-ED2, Energy Data Taskforce, 3rd Energy Package and ENTSO-E, DCUSA DCP 350, and Ofgem's Future Insights Paper, show increasing importance of data share between DNOs and stakeholders. This Project provides an holistic solution to meet those needs, across the energy industry. The Project will build upon DNO visualisation tools (e.g. heat maps) and Northern Powergrid Distribution Future Energy Scenarios work. It will improve upon the System Wide Resource Register (SWRR) (a starting point for DNOs publishing their data); in contrast with the SWRR, Flexr will be near real-time & massively scalable. Ofgem's Future Insights paper on Flexibility Platforms in electricity markets describes the need for "platform-level" functionality that connects data to a broad range of market platforms. The functions that the Paper describes, will be met by this Project. The functions are as follows: Coordination: Coordinating platform tasks and facilitating data flows; harmonisation of standards and principles, in alignment with external platforms and markets; underpinned by conflict avoidance. Flexibility procurement: Attracting flexibility providers and purchasers to the market, through communicating requirements and availability, together with matching providers and purchasers. Despatch and control: Sending signals to dispatch assets; notification of asset dispatch, and verification of asset dispatch. Platform transaction settlement: Verification of service against transaction; settlement of transactions. Analytics and feedback: Network analytics, response times etc.; counterparty scoring and review Identification of market faults This Project will act as an enabler to the GB flexibility market and aligns itself with all of the key functions as described above.

What Method(s) will be used and why? Ie, what is being demonstrated or developed? Please describe in terms of the NIC eligibility criteria. (page 1/3)

Hosted by Northern Powergrid under this NIC submission, the Flexr project will design, build and operate:

- Open Portal: A digital open portal that will allow market access to DER and DNO Asset Information
- Line of Business integration: Real time integration to all six DNO data estates in order to automatically observe defined changes to data that will enable the improved operation of the GB flexible energy market
- Common Flexibility Market Services: A set of Common Flexibility Market Services that will be used by the GB flexible energy market to automate standard messages and technical pathways for communication and operation that will enable the market to continue to grow and develop.

This NIC submission builds on the Minimum Viable Product (MVP) for the Flexr data-sharing service delivered in 2020; funded by £3.5m ElectraLink investment. ElectraLink will have delivered the following components under the MVP project in 2020:

- A Distributed Energy Resources (DER) Register populated from the ElectraLink dataset and from data sourced from DER providers
- Integration with a pathfinder DNO, which will surface network data and will evidence the impact of network data access on the acceleration of the flexibility market
- Proof of Concept Open Portal - the controlled access-point to the DNO and DER data registers for third parties.

The focus of Flexr is to enable commercial communication and innovation by industry. Flexr will be a first of a kind - unlocking data accessibility at scale to support for example, peer to peer exchange, electric vehicle applications and wider system use cases. Flexr will be designed and built from scratch and will focus on serving the market with standard near real-time events, messages and data. Industry testing will be of vital importance during the development of Flexr; therefore a beta group will be set up to test Flexr deliverables before their general release. A beta group is a collection of prospective users that will be actively involved in testing Flexr for usability and functionality. Beta group members report on what does and does not work in new Flexr software releases. ElectraLink will develop Flexr using good practice scaled agile methods. The Flexr components will be deployed as Beta versions to the Beta Group on a 12 week cadence as "production grade" into a "Flexr Model Office".

What Method(s) will be used and why? (page 2/3)

By definition a Model Office is a simulated working environment used to test business processes and IT systems with business processes to check that they satisfy their functional goals (e.g. Flexr is successfully automating data integration from a DNO to a Procurement Platform).

The Flexr Model Office will be a model technical environment hosted by ElectraLink on a highly secure private cloud environment in the UK. The model office will create and integrate the following technical elements:

- Open Portal (the POC having been developed by ElectraLink in 2020)
- Models of typical DNO technical platforms (such as Asset Management, GIS, Forecasting)
- Model flexibility market actor estates (to ensure that Flexr data is compatible with its users)
- Beta versions of the Common Flexibility Market Services which will integrate with other components in the Flexr Model Office.

The Flexr Model Office will aim to automatically communicate essential and standard flexibility events which occur on the DNO technical platforms to the appropriate market participants. For example:

- A flexibility tender event from a DNO system to Flexibility Procurement Platforms
- A despatch and control event from a DNO system to contracted DER Operators
- Transaction settlement information automatically to effected market actors
- Analytics and standard market reports to market actors
- Market coordination messages

ElectraLink will also work closely with the Beta group to ensure that they have full access to the Flexr Model Office, where the group will run use case scenarios to test the value, performance and usability of the services. Upon using the services, the Beta Group will have the opportunity to work closely with the ElectraLink development teams to provide rapid feedback on service usability and value. This will ensure that incremental improvements are made where necessary.

What Method(s) will be used and why? (3/3)

It is the purpose of the Flexr Model Office to rapidly prove the value of the portal, the DNO integration and the flexibility services. The Model Office programme will gain early industry feedback on the features and data within the portal, as well as the structure of the standard messages, and thus better understand that the services are useful and performant.

Once this has been proved in collaboration with the Beta group it will be possible to deploy Flexr for use by the entire GB flexibility market. It is proposed that the Flexr Model Office is retained and run beyond the term of the initial build phase of Flexr in order to ensure that all of the Flexr components are continually improved inline with the needs of the market.

Funding Commentary (page 1/2) *Licensee must provide a commentary on the accuracy of its funding estimate. If the Project has phases, the Licensee must identify the approximate cost of each phase. If the NIC is being used as match funding, please state the other sources of funding.*

This NIC funding application is for £9m, of a total £10m project.

NIC funding is being requested to fund development of the Flexr Commercially Viable Product (CVP) solution. This will include:

WP1 – Project management, technical and governance design (incl. direct costs): £3.8m

WP2 – Open Portal Development: £2.7m

WP3 – Line of Business Estate (LoBE) – will be provided by DNO resources

WP4 – Common Market Services: £3.5m

These initial costs are based on an agile and phased development approach, estimated during project scoping and are a rough order of magnitude with an uncertainty of +/-25%. The costs were estimated by an ElectraLink team which has experience of developing and delivering analogue projects such as the Data Transfer Service and Energy Market Data Hub. The project is in response to and has been informed by Ofgem's "Future Insights Series: Flexibility Platforms in electricity markets" and Energy Data Taskforce recommendations and the project has already received support from the DNOs, Ofgem and BEIS. Due to this, it is believed that the current solution and scope of the project should not vary much, however further detail and cost forecast accuracy will be achieved in summer 2020.

Funding Commentary (page 2/2)

The project will be led and managed by ElectraLink who will engage with two or three additional delivery partners who are experts in the required fields / solutions. Full details of partners and improved cost and contribution estimates will be given at FSP and will be shaped to demonstrate appropriate proportionality of costs and benefits.

Most Cost-Effective Approach

Prior to the NIC project, in 2020 ElectraLink will have self-funded (with no innovation funding) a £3.5m Minimum Viable Product (MVP) functional system of the solution whilst working with one pathfinder DNO to assess and integrate systems and data. This means that the NIC project will benefit from:

1) Defined solutions, development and improvement plans.

2) Proof of concept functionality with MVP data connections to the pathfinder DNO.

3) Optimised approach to line of business estate and DNO data integration, through "lessons learnt".

The delivery design is based on commercial off-the-shelf technologies which the delivery partners will bring together under one technical design authority using an agile methodology to accelerate, optimise and streamline development. Development partners will be drawn from non-Tier 1 companies, instead choosing "right-sized" for requirements in order avoid unnecessary process or delays.

The ElectraLink design team is basing the solution on several cloud technologies which have known configurable and integration capabilities, avoiding single tech/solution design which can lead to over-engineering and high costs. The agile approach will mean that useable functionality will be produced throughout the development life cycle, providing proven and apparent progress which can be tested, improved and optimised, reducing the risk of costly project over-run due to functional re-design.

Flexr will deliver a solution for DNOs and seek to map out collaboration opportunities across the wider energy system, to ensure a convergence of approach that will benefit all customers from both a temporal and spatial flexibility perspective.

Which specific requirements does the Project fulfill?		
Mark YES in the appropriate box(es)	**Electricity**	**Gas**
A specific piece of new (ie unproven in GB) equipment (including control and/or communications systems and/or software)	**Yes**	
A specific novel arrangement or application of existing electricity/gas transmission and/or distribution equipment (including control and communications systems software)	**Yes**	
A specific novel operational practice directly related to the operation of the electricity/gas transmission and/or distribution systems		
A specific novel commercial arrangement		

How does the Project accelerate the development of a low carbon energy sector and have the potential to deliver net financial benefits to existing and/or future customers in the relevant sector? (page 1/2)
Customers sit at the heart of Flexr. By enabling flexibility services, Flexr will lead to new and cheaper energy services, enhancing opportunities for market and product innovation. Customers will be able to access DNO information and data directly via an automated service, removing barriers to accessing services. This increased visibility will better inform decision-making for both customers and the energy industry, opening up market solutions and supporting vulnerable customers and the fuel poor through innovative, data-driven solutions. The Energy Data Taskforce report finds that a 'smart and flexible system can contribute to cumulative savings of up to £40bn by 2050'. It states that through opening up today's energy system data 'Net system savings (could) increase radically between 2020 and 2050,… (with) net annual system benefits (of) £0.12bn in 2020, around £2bn in 2030, (and) in 2050 we see an increase to over £10bn per year.' Flexr offers the lowest technical and commercial barriers for market participants; it brings all flexibility and associated data into a single portal. Net financial benefits will be delivered to customers by virtue of the DNOs opening up their data, bringing both efficiencies of scale and environmental improvements via a cross-DNO data-sharing and market enablement service under Flexr.

Accelerates the low carbon energy sector (page 2/2)

The Project will accelerate the low carbon energy transition. Flexr will surface data relating to the DNOs and the DER connected to them, in order to enable a wide range of use cases where data needs to be shared between stakeholders across the unbundled energy system. Flexr will share large volumes of data in near real time, where applicable, to enable joined-up operation across multiple platforms and systems. The following are examples of how Flexr will accelerate the low carbon energy sector. This project will build on learning from previous BAU projects and NIA innovation trials and projects such as Northern Powergrid's Spatial and AutoDesign projects; Flexr is the first innovation project to bring together all DNOs to deliver accessible data at scale.

Flexibility: - Optimisation of DER location, where DNO network capacity and constraints information could support the assessment of DER business cases during the planning phase. Once connected, operational DER data and DSO data could be shared to support the optimisation of flexibility and aggregation services.

- Optimise peer-to-peer trading, where transactions between peers can be optimised using Flexr data to consider network capacity and DER status, plus any future impacts of flexibility transactions.
- Enable day-ahead flexibility markets; DER flexibility could be operated in day-ahead timescales using Flexr.

Low carbon transport & smart cities: Data can be surfaced and shared across the DNOs and other players in the energy system, for example to optimise interaction between electricity distribution, transmission, gas, heat, transport and smart cities.

Electric vehicles and smart charging: Link network constraints with price signals, where electricity retailers will be able to create value for their customers by optimising smart electric vehicle charging, for example, based upon distribution network capacity as well as wholesale electricity market process.

Low carbon technology visibility: Leverage smart meter data for DNO use cases, given the appropriate governance, Flexr could leverage smart meter data to provide value for customers, e.g. by providing data for virtual network monitoring and LCT detection services.

Low carbon community energy: Local energy markets &virtual power plants, e.g. Cornwall LEM, where use of local distribution network capacity is optimised by managing power flows to and from DER and flexible demand.

How will the Project deliver value for money for electricity and/or gas customers?
Flexr will enable change at scale, by making accessible, standardised data available to those who need it, driving new opportunities and facilitating market development. The provision of this energy data is a key building block of our future electricity system that will serve to unlock flexibility and other solutions, driving value for the customer, wider market participants and playing a key role in improving overall system efficiency. Flexr will build on the work of the Open Networks project and other ongoing industry initiatives such as DCUSA DCP 350 and provide a single solution to data surfacing, and its governance, for all six GB DNOs. This approach will bring efficiencies to the unbundled electricity system by breaking down potential data silos and standardising, simplifying data exchange between parties. Flexr will provide an improved service to both the DNO customers and their stakeholders. ElectraLink will leverage enterprise grade technology and best in market agreed levels of service to greatly reduce the time to market and delivery programme costs of Flexr by developing Flexr on the Energy Market Data Hub. By making data available and accessible between electricity distribution stakeholders, Flexr will enable and accelerate innovation in new customer-centric platforms (some use-case examples are given on page 9), whilst reducing barriers relating to data acquisition. Flexr will also reduce barriers for existing platforms, for example flexibility markets, thereby helping them to become self-sustaining more quickly. By consolidating procurement activities to one service, i.e. rather than building six individual standardised data services (one per DNO), and by sharing learning from line of business connection activities between DNOs with similar data systems, Flexr will reduce the overall cost of procuring the required data service for the electricity distribution companies; an efficiency that will be reflected in the cost to customers. Finally, DNOs will be able to use the DER data from Flexr to optimally assess when reinforcement would be the best value solution. This will provide value for DNO customers, improve network reliability and reduce constraints for new customer connections.

How will the Project generate knowledge that can be shared amongst all relevant Network Licensees?
Flexr is a first of its kind initiative supported by all six GB DNOs, with the objective translating data from the GB DNOs' systems and processes into one common language through a state-of-the-art data sharing and market enablement service. All DNOs will contribute of Flexr's delivery and have access to regular progress updates, project steering opportunities and wider solution development. ElectraLink will work closely with all DNOs to ensure that project knowledge is shared, accessible and open to DNO scrutiny to ensure that the Flexr solution meets the requirements of all participating DNOs. The project will create knowledge through a series of data-driven use cases and evidence-based technology deployment and demonstration, to generate learning that will: 1. Underpin DSO transition and the move towards a lower carbon economy 2. Enable access to DER resources and optimise stakeholder engagement with those resources 3. Create new opportunities for market participants and innovators, and underpin market development 4. Enable increased flexibility across the energy market 5. Optimise customer understanding of DER and flexibility across the DNOs and wider energy market participants The Initial Screening and Full Submission Proformas, together with all Project Progress Reports and the Close Down Report will be published by Northern Powergrid on the Smarter Networks Portal. The Project team will ensure that all links are current; all documents in relation to the Project will also be published on the ElectraLink website. A strategic marketing plan will be put in place to ensure that the learning and knowledge from the Project is disseminated across Ofgem, the DNOs and other energy industry participants, including Government departments such as BEIS and OLEV. Under the plan, a series of case studies will be produced and disseminated via social media, press releases, webinars, speaking at industry events, and other means, to demonstrate and share learning. Northern Powergrid and its project partners will present interim and final findings at key industry events such as the Low Carbon Networks Innovation Conference.

Answering Yes or No, does the Project conform to the default Intellectual Property Rights (IPR) arrangements set out in the NIC Governance Document? *If answer is NO, the Licensee must demonstrate how learning will be disseminated to other relevant Licensees and how value for money will be ensured. The Licensee must also outline the proposed alternative arrangements and justify why the arrangements are more suitable than the default IPR arrangements.*
Yes.

How does the project demonstrate it is innovative (ie not business as usual) and has an unproven business case, that the innovation risk warrants a limited Development or Demonstration Project to demonstrate its effectiveness?
The Project is innovative in that it will develop and deliver a service for making DNO network energy and retail market data transparent and accessible across GB – all in one place. This is a GB energy networks' first. The project will fulfil a collective DNO requirement to share electricity system data in a coordinated, standardised, controlled and secure way. The service will provide a nationwide view of all distributed energy resources (greater than 100kW to start with, but ultimately it will extend to LV-connected resources) plus detailed network information for all six DNOs. This service takes innovation to the next level, to deliver DNOs' collective provision of a common GB energy system data service and set of tools that will facilitate a vibrant market in flexibility and trading services to drive the energy market transition. Led by Northern Powergrid, Flexr is the first NIC project that has buy-in from all six GB DNOs. Not only does this demonstrate the need for Flexr, it will ensure that the solution is developed to meet all six DNOs' requirements, whilst at the same time achieving mass economies of scale, by virtue of being deployed across all network licence areas. In summary, the Project is innovative in that it will: - Deliver a first-of-its-kind data-sharing and market enablement service - Catalyse increased innovation in the flexibility market space - Reduce barriers to entry for stakeholders - Be the first network innovation collaboration project across all six GB DNOs - Demonstrate how a central data service can enhance planning, forecasting, operation and DNO system integration with stakeholders – to the exclusion of none and the inclusion of all existing and future market actors. The Project will commence at TRL 4, and close at TRL 8, with a 'full scale demonstration in a working environment to test and improve technologies so they are ready for commercial deployment'.

How were Project Partners, external resources/funding identified, and what are their respective roles in the Project? Please evidence how Partners were identified and selected, including the process and rationale that has been followed. *The Licensee should provide details of any Project Partners who will be actively involved in the Project and are prepared to devote time, resources and/or funding to the Project. If the Licensee has not identified any specific Project Partners, it should provide details of the type of Project Partners it wishes to attract to the Project.*

This will be the first NIC funded project where the main project partners are the DNOs themselves, delivered by the DNOs' data provision and service partner, ElectraLink. It builds upon Proof of Concept work delivered and funded by ElectraLink in 2020; this Project has unparalleled foundations on which to catalyse and build a cross-DNO solution to address data-driven interaction and engagement across all GB customer types.

ElectraLink, the trusted third party delivery Partner in this Project, currently fulfils the unique role of the 'trusted processor' for energy market data. The Data Transfer Service (DTS) managed by ElectraLink, transfers the data required to support the retail energy market. In ElectraLink's role as trusted data processors of the data that is transferred over the DTS, it already has governed access to a significant proportion of the data that is required for the delivery of Flexr. This unique position in the energy market will reduce the cost of these services to customers. ElectraLink will subcontract the technical development of the Flexr service, with selection based on four criteria (in no order of preference):

Value for Money: ElectraLink is mindful that it is vital that the Flexr programme is delivered for an investment that represents great value to UK PLC.

Cultural Fit and Innovation: The development partners will need to have the right mindset and culture to innovate and design Flexr from the ground up.

Development Approach: It is imperative that the development partners are experienced at adopting modern processes and disciplines such as Scaled Agile, DevOps and Lean in order to ensure transparency and the maximum amount of customer value.

Experience of Developing "Flexr like" Programmes: Experience of delivering highly available, highly scalable services will be essential in ensuring the successful delivery of Flexr. Moreover, we will aim to contract with development partners who have experience of working in the UK energy sector.

Would the Project require any derogations or exemptions to current regulatory arrangements? *If YES, please provide details of the required changes.*
Not applicable.

How will the Project activities impact customers? *The Licensee should outline any planned interaction with customers or customers' premises as part of the Project, and any other direct customer impact (eg amended charging arrangements, supply interruptions).*
There is no planned customer interaction or engagement as part of the delivery of this project.

This question is for Cross-Industry Projects only. What funding is being requested from each NIC? Please include justification for the funding split.
Not applicable – Electricity NIC only.

Are there any further details the Licensee considers would support its submission?
The Flexr project has the buy-in of all six GB DNO CEOs, with the DNOs having indicated approval for putting this project forward for NIC funding – Northern Powergrid considers that this is a first for an NIC application, and demonstrates the depth of need for this unprecedented and highly coordinated approach to development and delivery of a data-sharing service. A Flexr Development Steering Group (FDSG) was established in early 2020, with senior level commitment from all six GB DNOs. This demonstrates readiness to proceed. FDSG members are: Paul Bircham – Electricity North West Jim Cardwell – Northern Powergrid Andrew Roper – Scottish and Southern Electricity Networks Graham Campbell – SP Energy Networks Matt Webb – UK Power Networks Graham Halladay – Western Power Distribution The FDSG met for the first time on 18 February 2020, with the second meeting taking place on 17 March. It was at the 17 March meeting that agreement was reached by the DNOs, that ElectraLink should explore NIC funding as an appropriate mechanism by which to fund development of Flexr. The Project will operate under a Steering Group (potentially aligned with the FDSG). In parallel, the project will seek partners for an advisory group (or similar) to engage other key stakeholders. This is likely to include the transmission, ESO, gas networks, generators, suppliers and the Leeds Open Data Institute, as deemed appropriate, in an advisory / consultative capacity with a view to exploring the roll out of Flexr system-wide at a later date. As highlighted in the body of this ISP, Northern Powergrid firmly believes that this Project meets policy ambitions set out by Ofgem, BEIS and the Energy Data Taskforce. It will set the foundation for making electricity data available, at scale and in near real-time, to those who need it. Critically, it will create new cross-vector opportunities for market development for all electricity system participants, imbuing benefits to customers across the networks.

Contact Information (Cross-Industry Projects can provide two contacts)

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