Electricity Network Innovation Competition Screening Submission Pro-forma

Notes on completion

Before completing this form, please refer to the Electricity Network Innovation Competition (NIC) Governance Document, which details all of the information that you are required to provide.

Please use Verdana size 10 font in your submission. The text entry areas are suggestions and the size of each text area can be altered if you need to provide more information in one section and less in another. In all cases the full-completed submission should not exceed **11 pages** in total.

Ofgem will publish all the information contained within the Screening submission.

Funding Licensee

Western Power Distribution (South West)

Network Licence Project Partners

Western Power Distribution (South Wales); Western Power Distribution (West Midlands); Western Power Distribution (East Midlands)

Funding Licensee area *(or where the licensee does not operate in a specific area the geographic location(s) of the Project)*

Western Power Distribution: West Midlands, East Midlands, South West and South Wales.

Project title

Telecoms Templates for a Low Carbon Future (WPD_NIC_001)

Project Summary

The Licensee must provide an approximate Project start and end date.

Telecoms and secure operational IT networks are an enabler for the roll out of Smart Grid services that facilitate a Low Carbon future. Evidence gathered from smart grid projects has shown that poor communications act as a barrier preventing the effective roll out of smart grid solutions.

Telecoms Templates will seek to develop a structured methodology that enables network planners to select 'fit for purpose' communications, considering the range of applications and techniques being deployed in networks. The project will test a comprehensive range of templates based around established and emerging use cases.

Over a period of three years, from January 2016 until 2019, *Telecoms Templates* will deploy selected communication technologies and solution architectures as trials to prove fit for purpose communications across Smart Grid services.

Estimated Project funding

The Licensee must provide an approximate figure of the total cost of the project and the NIC funding it is applying for.

Total cost of Project	£14,200k	**NIC funding requested**	£12,780k
Cross Sector Projects only: requested funding from Gas NIC or NIA?	*If yes, please specify*		

Problem(s)

The Licensee must provide a narrative which explains the Problem(s) which the Project is seeking to address. 36 lines max

Transitioning to a Low Carbon Future

The challenge presented from a network operations and management perspective as a result of the decarbonisation requirements within the Carbon Plan, is that new performance levels for telecoms systems will be defined. Existing issues such as ageing infrastructure as well as rapidly changing consumer attitudes to energy consumption will place further strain on electricity networks and their communications infrastructure.

To date many innovative systems/ solutions have been designed and implemented as a result of the LCN funding. In many cases the underlying communications have been acknowledged as a severely limiting factor to the successful operation of these systems within a trial environment. Furthermore, concerns regarding cyber-security within the developing Smart Grid network infrastructure will place an increasing demand on network operators and suppliers alike to maintain operations and provide security of critical data. There are two reasons for these issues, first there is a lack of suitable selection method for telecoms in the utility environment and second the move towards increasing Smart Grid services is creating a new OT environment. The development of wide scale OT architecture is an inherent part of Smart Grid Services allowing machine to machine communications to function reliably, securely and independently from current IT infrastructure with its different requirements and parameters suited to human interactions.

Smart Grid services will have an increasing dependency on telecoms, witnessing further constraints as the roll-out of current technologies/ applications continues to grow. The evolution towards a low carbon future is highly dependent upon enablers such as telecoms. Without a strategic approach to their implementation, concerns noted to-date within current systems will result in a piece-meal introduction of sub-standard Smart Grid services and technologies.

This defines the need for a well planned and engineered telecoms system(s) within the vast and largely emerging Smart Grid environment. Such project learning will establish efficient network planning and system integration guidelines, delivering lower costs to customers, reduced carbon output, offset existing CAPEX infrastructure investments and deliver operational efficiencies. Ultimately this will provide a stable, secure and considered approach to the implementation of Smart Grids and Low Carbon Technologies.

Therefore the implementation of the *Telecoms Templates* project is tangibly linked to the existing and future roll-out of successful Smart Grid services.

Method(s)

The Licensee must describe the Method(s) which are being demonstrated or developed. It must also outline how the Method(s) could solve the Problem. The type of Method should be identified where possible eg technical, commercial etc.

To overcome the noted concerns within telecoms integration and application in Smart Grid services three methods will be applied within the project;

(1) Global Review;
(2) Enhanced Testing
(3) Templates Development

The Global Review will consolidate learning from WPD, GB, EU and global smart grid projects. It will critique the success/failure of each solution and make recommendations for further development. Their suitability for each category of Smart Grid Service* will be assessed. This method will Include solutions at the R&D/initial prototype stage (ie: emerging solutions) and ultimately produce an encyclopaedia of "OT for Smart Grids".

Method(s) continued

The Enhanced Testing method is the main element to the project. It will replicate previous trials if justified (eg. at a bigger scale or where there is a need for UK customisation). It will also demonstrate emerging solutions if justified. The method will develop conformance tests the future Smart Grid Services*. The testing will involve the construction of up to 15 test zones across the WPD area where vendor equipment will be submitted to test. Equipment test results will be collated to form a "best buy" report.

Templates development will follow on from the previous methods. It will define cross sector utility telecoms Smart Grid Services* working with ENA and JRC committees. Each service will have an application profile which will be useful to all DNOs (and GDNs). The method will also develop a target OT architecture including management platforms for security and configuration. Importantly this method will also create a software based solution picker system for network planners to use when designing new connections of reinforcement schemes. Finally this method will produce GB Utility Telco interoperability profiles and training course plus the necessary WPD company policies.

* The identified Smart Grid Services are SCADA, Protection, Semi-Autonomous Control and Diagnostics.

Funding commentary

The 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. OFTOs should indicate potential bid costs expenses.

This 42 month project will consist of a series work-streams, running with a degree of concurrency;

Work-Stream A (£1,000k) – Desktop Evaluation/ Template Baseline, *estimated duration, 9 months* - A desktop study of existing communications techniques, their typical areas of application and suitability for future Smart Grid service requirements.

Work-Stream B (£10,200k) – *Estimated duration, 30 months.*
i) Solution Picker Construction – development of a tool to facilitate the easy selection of fit for purpose Smart Grid telecoms
ii) Telecoms Technology; Build - design, construction and commissioning of the chosen trial networks within both 'retro-fit/ legacy' and 'new' project environments
iii) Telecoms Technology; Trials – systematic evaluation of applied technologies against the trial content

Work-Stream C (£3,000k) – Analysis and Dissemination, *estimated duration 12 months* – Results capture, analysis and evaluation for the development of new standardised approaches, including the formal release of the solution picker and templates, alongside the industry dissemination of project learning.

Specific Requirements (please tick which of the specific requirements this project fulfils)

A specific piece of new (ie unproven in GB) equipment (including control and/or communications systems and/or software)	√
A specific novel arrangement or application of existing electricity transmission and/or distribution equipment (including control and communications systems software)	√
A specific novel operational practice directly related to the operation of the electricity transmission and/or distribution system	
A specific novel commercial arrangement	

Accelerates the development of a low carbon energy sector & has the potential to deliver net financial benefits to existing and/or future Customers

The Licensee must demonstrate that the Solution has the potential to accelerate the development of the low carbon energy sector in GB and/or deliver wider environmental benefits to GB Customers. The Licensee must demonstrate the potential to deliver net financial benefits to existing and/or future Customers.

As stated in the Electricity NIC Governance Document, the Network Licensee must provide the following to demonstrate compliance with this criterion:

i. How the proposed Project will make a contribution to the Carbon Plan. In particular the Network Licensee should outline:
- *What aspects of the Carbon Plan the Solution facilitates*
- *The contribution of the rollout of the Method across GB can have in facilitating these aspects of the Carbon Plan*
- *How the rollout of the proposed Method across GB will deliver the Solution more quickly than the current most efficient method in GB; and/or*

ii. How the proposed Project could deliver environmental benefits to Customers; and

iii. The expected financial benefits the Project could deliver to Customers.

Contributing to the Carbon Plan

The deliverables stated within the Carbon Plan require an emission reduction of 25% by the year 2022 and a further 50% by the year 2027. Such a reduction will be intrinsically linked to the transition to a smarter grid and the introduction of Low Carbon Technologies.

The introduction of the Low Carbon Network Funding (LCNF) scheme in 2010 provided investment levels of up to £500M for DNO sponsored projects which were designed to demonstrate new technology, operating and commercial arrangements – all of which are considered critical aspects of the transition to a low carbon economy. Even within such trial environments, concerns have been noted with regard to the suitability of the applied communications systems or the interfaces between some technologies – these limitations will hamper the operational functionality of these innovative systems and thusly the financial and carbon savings which could be realised as a result of their application.

The benefits of the *Telecoms Templates* project are the ability to successfully facilitate the transition to a low carbon future, through the important role of telecommunications as an enabler for the continued growth of Low Carbon Technologies and the subsequent management techniques and systems.

It is by undertaking the *Telecoms Templates* project that the outcomes of a systematic study, supported with applied trial results, will provide the strategic, top-down, approach to the design and bottom-up delivery of communications systems required. These outputs will build confidence with DNO's regarding communications, providing the assurance that dependant projects can be delivered as designed without frequent concerns to their communications mediums. Additionally through focussing on the telecoms requirements of Smart Grid at this stage, the *Telecoms Templates* project seeks to define the necessary attributes of communication systems for the power utility sector across the UK.

Potential to deliver net financial benefits

By defining equipment requirements, of both vendors or service providers, and resolving telecoms issues at a pre BAU stage, *Telecoms Templates* will seek to avoid massive additional expense further into Smart grid rollouts. The expected outcome of *Telecoms Templates* is that the templates demonstrated, and associated selection tool, can be readily adopted in new projects or BAU rollout without further expenditure on development of communications solutions on a case by case basis.

Delivers value for money for electricity Customers

The Licensee must demonstrate that the Method(s) being trialled can derive benefits and resulting learning that can be attributed to or are applicable to the electricity transmission system/ to the electricity Distribution System.

As stated in the Electricity NIC Governance Document, the Network Licensee must provide the following to demonstrate compliance with this criterion:

i. What is the potential Direct Impact of the Project on a Network Licensee's electricity network or on the operations of the GB System Operator;
ii. Justification that the scale/ cost of the Project is appropriate in relation to the learning that is expected to be captured;
iii. The processes that will be employed to ensure that the Project is delivered at a competitive cost; and
iv. The expected proportion of the benefits which will accrue to the electricity Transmission System/to the electricity Distribution System as opposed to other parts of the energy supply chain.

Sub-criterion v (the internal systems, procedures and processes used by the Network Licensee to identify Project Participants and Project ideas) should be covered in the 'Project Partners and external resourcing/funding' section below.

The current telecoms methods which are applied to-date already demonstrate limitations within both business as usual systems and even more so within scalable Smart Grid solutions as witnessed within LCNF projects.

The *Telecoms Templates* project comes at a critical juncture for the industry as a whole, whereby the cost of not completing such an innovative project would far outweigh the short term expenditure given the lack of strategic direction and communicated best practice for the integration of technologies and solutions within the transport layer of smarter networks. The *Telecoms Templates* project will overcome current and future frustrations noted within the continued transition toward a low carbon economy in given scenarios such as securing faster and more efficient connections of low carbon technologies, a core requirement stated within the Carbon Plan.

Working with power industry experts, academics and suppliers from across the telecoms domain, *Telecoms Templates* will deliver templates for a number of applications - defining application profiles (interfaces, telecoms technologies, security schema and management methodologies) that can be disseminated throughout the industry for wider use. Throughout the template areas a suite of trials will be established which will facilitate the creation of the selection tool and underlying template analysis. In order to define and test these generic trial packs and obtain sufficient detail as a result of their application, a series of template projects are envisaged. The scale of the individual projects within *Telecom Templates* will be determined on a case by case basis and will be defined by the identified issues with each telecoms technology selected for trial.

Value for money will be ensured with the application of a competitive procurement process throughout. This process will be aligned with the best practice/ commercial outcomes of previous LCNF projects to date, to ensure those suppliers chosen will add maximum value at appropriate cost.

The core aims of the *Telecoms Template* project are to identify the suitability of telecoms technologies within electricity networks. However, it is expected that these telecoms types will be applicable within the wider world of utilities, providing immediate and direct value to the electricity distribution networks which could also be applied within the supply chain and wider utility industries alike.

Demonstrates the Project generates knowledge that can be shared amongst all Network Licensees

The Licensee must explain the learning which it expects the Method(s) it is trialling to deliver. The Licensee must demonstrate that it has a robust methodology in place to capture the learning from the Trial(s).

As stated in the Electricity NIC Governance Document, the Network Licensee must provide the following to demonstrate compliance with this criterion:

i. What new knowledge is intended to be generated from completing the Project;
ii. What methodology will be used to capture results from the Project and how the Project's results will be disseminated to other Network Licensees; and
iii. Whether the Network Licensee wishes to conform to the default IPR arrangements as set out in Section B: Chapter 9. If the Network Licensee wishes to deviate from the default IPR arrangements it must outline the proposed arrangements, justify why the arrangements are more suitable than the default arrangements and justify how the new arrangements will deliver value for money for Customers.

With the creation of a suite of holistic design and guidance tools, the *Telecoms Templates* project will provide the electricity industry with a prescriptive process for the identification and assignment of communications types along with guidance for the integration of fit for purpose communications within network design. The templates, selection tool and best practice guide will ensure independent approaches witnessed historically from planners and communications professionals are aligned – integrating the two sectors is critical for the effective transition to a low carbon future. Furthermore, the *Telecoms Templates* project will establish a process for the definition of future templates, enabling applicable industry representatives to apply this innovative approach to areas considered out-of-scope to this project.

The *Telecoms Templates* project will build on the knowledge, experience and existing best practice gained from a UK and international industry desktop review. To date no such industry review has been completed to understand how the integration of BAU/ future systems and their corresponding telecoms types should be handled. Without this strategic review siloed knowledge could develop, removing an industry wide approach to such critical infrastructure establishment.

The *Telecoms Templates* project, with its carefully selected partners and suppliers, will deliver industry wide learning –captured and disseminated using the same robust methodology which WPD has successfully employed throughout previous projects. The project will conform to the default IPR arrangements as set out in Section B: Chapter 9 of the document, ensuring value for money for customers.

Please tick if the project conforms to the default IPR arrangements set out in the NIC Governance Document?	√

If the Licensee wishes to deviate from the default requirement for IPR then it must demonstrate how the learning will be disseminated to other 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 arrangements.

Not applicable.

How is the project innovative and with an unproven business case where the innovation risk warrants a limited Development or Demonstration Project to demonstrate its effectiveness?

Demonstrate why the Licensee has not previously used this Solution (including where the Solution involves commercial arrangements) and why NIC funding is required to undertake it. This must include why the Licensee would not run the trial as part of its normal course of business and why the Solution is not Research.

As stated in the Electricity NIC Governance Document, the Network Licensee must provide the following to demonstrate compliance with this criterion:

i. Why the Project is innovative and has not been tried before;
ii. Why the Network Licensee will not fund such a Project as part of their business as usual activities;
iii. Why the Project can only be undertaken with the support of the NIC, including reference to the specific risks (e.g. commercial, technical, operational or regulatory) associated with the Project.

The requirement for a strategic, top-down design approach to the implementation of communications systems within electricity networks is of critical importance to transmission and distribution businesses along with their suppliers. Only by undertaking the *Telecoms Templates* project will an innovative approach to system design and integration be available throughout the industry.

The work identified within the project would not form a part of WPD's BAU activities because it is entirely interdependent on the parallel activities of Smart Grid project deployments, in as much as these projects are vital to the transition to a low carbon future so the telecoms by nature must also be recognised as an enabler of all Smart Grid projects and solutions. This highlights the timely delivery of this project with the completion of a number of LCNF projects which will in part provide the underlying applications forming a component of the trial work stream.

The earnings received by DNOs, such as WPD, is received to ensure security of supply to end users. NIC funding however is a mechanism to explore alternative/ innovative techniques which may deliver value (operating efficiencies/ cost reductions) within the Smart Grid environment. The *Telecoms Templates* project clearly sits outside of the BAU activities for DNOs at present, however the project recognises the vital role of telecoms within the BAU Smart Grid environment.

How is the project innovative and with an unproven business case where the innovation risk warrants a limited Development or Demonstration Project to demonstrate its effectiveness? (Continued)

Project Partners and external resourcing/funding

The Funding Licensee should provide a description of the internal systems, procedures and processes used by the Funding Licensee to identify Project Participants and Project ideas.

The Licensee should provide details of any Project Partners, External Funders or Non-Network Licensees 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.

The following Project Partners have been identified at ISP stage:

•Full Submission Development – Siemens were selected through a competitive process to assist with the project at submission stage. This was based on price and their capabilities in the areas of Smart Grids and Telecoms. Further they have indicated their desire to devote time, resources and funding to the Project should the submission be successful.

•Project Delivery – Telecoms consultancy expertise will be fully defined prior to full submission and a competitive selection process carried out.

•Academic partner – the need for an academic partner will be determined prior to full submission. Any support will be procured through a competitive process.

•Technology vendors will be selected through a competitive process to deliver best value for money to customers and to ensure fair market prices. The equipment suppliers of new technologies have not been identified at this stage.

•For standard equipment, WPD will utilise existing framework agreements, using EU-compliant systems already in place to provide best value to customers.

Derogations or exemptions

The Licensee should outline if it considers that the Project will require any derogations, exemptions or changes to the regulatory arrangements.

Western Power Distribution does not, at this stage in the development of the project, believe that it will require any derogations or exemptions to implement and deliver the project.

Customer impact

The Licensee should outline any planned interaction with Customers or Customers' premises as part of the Project, and any other impacts (such as amended contractual or charging arrangements, or supply interruptions). 24 lines

Customer Relationships

Western Power Distribution will publicise the *Telecoms Templates* project throughout their Innovation team and extended carbon agenda within the business. The engagement process/ methodology established and refined throughout past Western Power Distribution Innovation projects will see customers whom could be affected within the trial areas targeted. Applicable discussions are then scheduled to successfully engage and manage said stakeholders involvement within the project – recruiting potential trial participants as applicable.

Customer Impact

The project will seek to test and analyse the hypothesis that communications methods can be organised to identify those 'fit-for-purpose' for particular applications. As the project envisages to establish a series of trials within a number of existing and new applications, UK DNO's will be engaged to determine the suitability of trialling revised communications approaches within specific areas of their network. The trials are designed to improve the existing operation of specific systems, therefore potentially reducing the impact to customers.

There will be no direct impact on relevant customers as a result of this project.

Details of cross sector aspects

The Licensee should complete this box only if this Project forms part of a larger cross sector Project that is seeking funding from multiple competitions (Electricity NIC and Gas NIC). The Licensee must explain about the Project it will be collaborating with, how it all fits together, and must also add a justification for the funding split.

Not applicable

Any further detail the Licensee feels may support its submission

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