Question No.	Proforma section	Criteria	Topic	Question	Date question asked	Date response required	Date received	Follow up to Question #	Confidential (y/n)
1	2	a) Enviro+consumer bens		Please elaborate on why the difference between licence area benefits and GB benefits is relatively small.	16/08/2016	18/08/2016	18/08/2016		
2	2	b) Value for money		Please provide a table with a breakdown of indicative day rates and person days for SPEN and each project partner. This should be based on the amount of person days required and proposed labour costs.	16/08/2016	18/08/2016	18/08/2016		
3	2	b) Value for money		Please explain why the project forecasts negative financial benefits in 2030 for an individual deployment.	18/08/2016	22/08/2016	22/08/2016		
4	2	b) Value for money		Please provide a description of how the travel and expenses budget has been determined. Please provide a breakdown of these costs if available.	18/08/2016	22/08/2016	22/08/2016		
5	2	b) Value for money		The Full Submission Guidance states 'Enough information should be included in this [NPV] summary so that it can be used in conjunction with the data in the Full Submission Spreadsheet to enable the Panel to independently calculate the Net Present Value of each Method.' Please direct us to where you have provided this information in your submission.	25/08/2016	30/08/2016	30/08/2016		
6	2	d) Is innovative		Is the system the development of a Network Model Manager(NMN) as described by EPRI? If it is not please be very specific about what this system will do differently from a NMN.	25/08/2016	30/08/2016	30/08/2016		
7	2	Mulitple		Your risk budget is 225K out of atotal 8517K, 2.6%. Do you think this is an appropriate level of contingency within a complex IT project?	25/08/2016	30/08/2016	30/08/2016		
8	2	g) Robust methodology/ready to implement		What lessons has SPEN learned from other complex IT projects and how have you applied these learnings to INSPIRE, with specific reference to risk and contingency.	25/08/2016	30/08/2016	30/08/2016		
9	2	b) Value for money		You have £167K for equipment and £657K for IT. Provide detail of what this is and why it is needed	25/08/2016	30/08/2016	30/08/2016		
10	2	g) Robust methodology/ready to implement		If it is what other NMN packages has SPEN investigated and rejected? What reasons are there for the rejection of existing NMNs?	25/08/2016	30/08/2016	30/08/2016		
11	2	b) Value for money		Has SPEN issued an RFI through any procurement process, Achiles or other, for these services? If not why not?	25/08/2016	30/08/2016	30/08/2016		
12	2	d) Is innovative		You state that CIM does not cover off every identifier usd in the GB electricity industry at present. Do you believe that CIM extensions will be able to fill this perceived gap? If so will you be feeding these extensions back into the standards making process through the BSI's representation on CIM?	25/08/2016	30/08/2016	30/08/2016		
13	2	d) Is innovative		You state that CIM has limitations due to the requirement for UUIDs. Is this limitation not in fact down to the same issue you would face with any mutli-vendor integration issue. If it is not then how would you get around this using other standards or software packages?	25/08/2016	30/08/2016	30/08/2016		
14	2	d) Is innovative		You propose to create your own data translators (CIM) to interface between the WISP and each of the core systems (GIS, DMS etc.). Why have you chosen to do this rather than utilise pre-existing translators/adaptors from the OEM vendors?	25/08/2016	01/09/2016	01/09/2016		
15	2	d) Is innovative		Have you discussed this with the vendors and found they are unable or unwilling to do so? GE and ESRI have provided letters of support to the project yet there is no metion of utilising their CIM export capabilities, we are curious as to why not.	25/08/2016	01/09/2016	01/09/2016		
16	Appendix L	g) Robust methodology/ready to implement		If you produce your own adaptors how will these be kept up to date when core systems change in future? Will the WISP have to have new adaptors created to manage changes in core systems? If so who will carry out the upgrades?	25/08/2016	01/09/2016	01/09/2016		
17	Appendix L	d) Is innovative		If you produce your own adaptors how will you enure that they have full access to the model data held within the core systems databases as often the data is in a proprietary format or restricted in some way. Will there be significant reverse engineering needed to create these adaptors?	25/08/2016	01/09/2016	01/09/2016		
18	Appendix L	g) Robust methodology/ready to implement		If the adaptors are created how will you ensure their efficacy and accuracy?	25/08/2016	01/09/2016	01/09/2016		
19	Appendix L	d) Is innovative		You state that granularity is needed in the model and that the WISP will produce abstractions from a maximum detail model. Is this not the same functionality that exists inany network management system/analysis package?	25/08/2016	01/09/2016	01/09/2016		
20	Appendix L	d) Is innovative		You state that this system will assist with versioning issues, specifically with future versions. How will the WISP handle future versions of CIM especially if the adaptors are within the WISP and not provided by the OEM vendors of the core systems?	25/08/2016	01/09/2016	01/09/2016		
21	4	d) Is innovative		Please provide any technical information available related to project OASIS?	25/08/2016	01/09/2016	01/09/2016		
22	4	d) Is innovative		The proposal states that the WISP is taking a reference copy and that mastering is in each of the core systems as silos. How does this approach improve current	25/08/2016	06/09/2016	06/09/2016		
23	4	d) Is innovative		If data is mastered in each of the core systems how does the WISP help reduce duplication of effort, does a transformer still have to be described separately in	25/08/2016	06/09/2016	06/09/2016		
24	Appendix K	d) Is innovative		If data still has to be entreed multiple times how would the WISP assist with scaling from X systems now to Y systems in future?	25/08/2016	06/09/2016	06/09/2016		
25	n/a	d) Is innovative		Is data entry to each silo manual? If so how does this method manage the risks inherent with manual data entry across multiple systems? How does this improve	25/08/2016	06/09/2016	06/09/2016		
26	n/a	c) Generates new knowledge		Is the reference copy in the WISP updated manually or automatically?	25/08/2016	06/09/2016	06/09/2016		
27	n/a	g) Robust methodology/ready to implement		How does the WISP help ensure that the data in the silos is in sync and up to date?	25/08/2016	06/09/2016	06/09/2016		
28	n/a	g) Robust methodology/ready to implement		If errors are found in the INM how and where are the fixed applied? In the INM or in the siloed systems? Is this process manual or automatic?	25/08/2016	06/09/2016	06/09/2016		
29	n/a	g) Robust methodology/ready to implement		You state there are overlapping standards with CIM, specifically IEC61850. Are you aware of the harmonization work going on at present by the IEC in this area? If so how will SPEN engage with this and feed into the standards making process?	25/08/2016	06/09/2016	06/09/2016		
30	n/a	g) Robust methodology/ready to implement		Please provide further details on the planned level of engagement with the GB DNOs and TOs. Please provide in full the letters of support received from network licensees. Please explain whether or not a letter of support has been received from UKPN.	08/09/2016	13/09/2016	13/09/2016		
31	n/a	g) Robust methodology/ready to implement		Please describe and provide information on the work undertaken so far to understand the diversity of DNO and TO systems that will need to be accommodated. Please explain the degree to which the project intends to harmonise interfaces of the same functional systems (such as, for example, network planning tools).	08/09/2016	13/09/2016	13/09/2016		
32	n/a	c) Generates new knowledge		Please provide a breakdown of background IP and its ownership that will be used by the project.	08/09/2016	13/09/2016	13/09/2016		
33	n/a	c) Generates new knowledge		Please provide a breakdown of the foreground IP that will be developed during the project and its ownership (including IP funded and developed by partners).	08/09/2016	13/09/2016	13/09/2016		
34	n/a	c) Generates new knowledge		Please indicate which items of background and foreground IP will be required to roll out the solution.	08/09/2016	13/09/2016	13/09/2016		
35	2	c) Generates new knowledge		In addition to your response to Question 9 of the Q&A, can you clarify which will be additional licences for the software components.3	08/09/2016	13/09/2016	13/09/2016		
36	n/a	Mulitple		For each of the Use Cases please state which tools are already available on the market, what their shortcomings are and why it is not feasible to procure them as part of BAU. For example, for network planning there are commercially available network management tools that included load profile data management in real-time and for scenario planning that may meet the requirements of Use Case 4.	08/09/2016	13/09/2016	13/09/2016		
37	n/a	Mulitple		Please clarify where the following will be hosted (for example on a local SPD server or the Cloud): o The WISP engine and the data / meta-data o The new applications o The new data produced using the WISP and its associated applications	08/09/2016	13/09/2016	13/09/2016		
38	6	b) Value for money		You have indicated that the approximate rollout cost per DNO [redacted]. Can you please indicate what this includes (hardware, software and services) and if there will be any ongoing licence fees?	08/09/2016	13/09/2016	13/09/2016		

39	n/a	e) Partners and ext. funding		Where ongoing services are to be provided by CGI (such as upgrades, uploading and verification of third party apps, etc) please indicate the approximate one-off	08/09/2016	13/09/2016	13/09/2016		
40	n/a	e) Partners and ext. funding		Please indicate which services (hosting, upgrades, maintenance, etc) and licences will be exclusive to CGI, ie which components of this project will be tenderable in an open competition by SPD or another DNO at the outset and periodically.	08/09/2016	13/09/2016	13/09/2016		
41	n/a	b) Value for money		Please provide details of exactly what will be provided free of charge (as stated by SPD at the bi-lateral meeting on 7/9/2016) to third party developers and what will they have to procure from others to be able to develop applications.	08/09/2016	13/09/2016	13/09/2016		
42	n/a	g) Robust methodology/ready to implement		Please set out in detail (as discussed at the bilateral meeting on 7/9/2016) the scope of the project for each of the Use Cases, describing: o the systems to be integrated providing the system names, outline of their functions and the data to be integrated from them o the part of the network for which this is the case indicating the number of substations and the circuits / transformer and the voltage levels o the applications that will be developed for the Use Case	08/09/2016	13/09/2016	13/09/2016		
43	n/a	d) Is innovative		Specific to Use Case 4 explain how the additional benefit (compared to BAU) will be derived from the applications to be developed.	08/09/2016	13/09/2016	13/09/2016		
44	n/a	b) Value for money		Please confirm the value of funding that will be spent on each project partner (incl labour and equipment costs).	08/09/2016	15/09/2016	15/09/2016		
45	Appendix A	e) Partners and ext. funding		Please provide an estimation of potential benefits to project partners in the event of rollout on the GB scale as presented in the benefits estimation in appendix A.	08/09/2016	15/09/2016	15/09/2016		
46	n/a	e) Partners and ext. funding		Please provide a justification of the level of contribution to the project from each project partner. The response should consider partner cost to the project and the potential to benefit post project.	08/09/2016	15/09/2016	15/09/2016		
47	Appendix B	a) Enviro+consumer bens	Carbon benefits	We understand that your carbon benefits are based on the FES Gone Green scenario. Please provide some analysis to show the sensitivity of the estimated carbon benefits under different Future Energy Scenarios.	13/09/2016	15/09/2016	15/09/2016		
48	Appendix B	a) Enviro+consumer bens	Carbon benefits	We understand that your carbon benefits have been estimated on the basis of additional generation capacity released by the solution. Please provide an estimate of wider carbon/environmental benefits of the solution from connection of LCTs and avoided reinforcement.	13/09/2016	15/09/2016	15/09/2016		
49	Appendix B	a) Enviro+consumer bens		Please provide an indication of the sensitivity of the benefits to roll-out assumptions.	13/09/2016	15/09/2016	15/09/2016		
50	n/a	a) Enviro+consumer bens		How much of the capacity and carbon savings are truly NET ADDITIONAL to GB?	20/09/2016	22/09/2016	22/09/2016	47	
51	n/a	a) Enviro+consumer bens		How will Inspire provide benefits during ED1?	27/09/2016	29/09/2016	29/09/2016		
52	n/a	a) Enviro+consumer bens		The bid is based on the premise of a 'whole-systems' approach to data. 'Whole systems' is defined as encompassing 'power system and business system and future new systems (e.g. customer systems or aggregator systems)'. Please note that Ofgem and CEER have been using the term 'whole systems approaches' to describe approaches which best meet customer needs across all voltage levels. To what extent is the proposal intended to support efficient whole system outcomes in this context?	27/09/2016	29/09/2016	29/09/2016		
53	n/a	f) Relevance and timing		Ofgem recently presented to the ENA's TDI steering group on the need for greater co-ordination between DNOs, the SO and TOs on network planning and efficient use of system resources in operational timeframes, in order to deliver the best whole system outcomes for consumers. The ENA took away an action to scope out work packages in this area. As well as engaging with individual stakeholders such as the SO and customers, how is the project intending to engage with groups such as the ENA TDI SG who are likely to be generating thinking which can inform the objectives (via current and future use cases) and development of data platforms such as this?	27/09/2016	29/09/2016	29/09/2016		
54	n/a	c) Generates new knowledge		The use cases describe how INSPIRE can achieve co-ordination of smart grid solutions, as well as enhanced network visibility/information exchange. To what extent is INSPIRE intending to integrate data on the availability/location etc of flexibility providers at distribution level (ie flexible resources who may be offering services to the DNO or the SO), to inform these smart grid solutions?	27/09/2016	29/09/2016	29/09/2016		

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: _INSPIRE_____

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	01
Question date	16 August 2016	Answer date	18 august 2016
Submission section question relates to	Section 3 Project Business case		
Topic	Cost Benefit Analysis		
Question	Please elaborate on why the difference between licence area benefits and GB benefits is relatively small.		
Notes on question			
Answer	This is due to the very conservative assumptions we have made in calculating the benefits from GB rollout. Rather than assume that the method will be applied in all licence areas simultaneously on conclusion of the project we have assumed a gradual rollout as follows: - A Whole-systems Information Synthesis Platform (WISP) will be taken up by one of the 14 licence areas every 2 years. There will be one Application associated with each WISP initially increasing at a rate of one per year thereafter. In calculating licence area benefits, we have assumed implementation of a WISP at the end of the project together with 4 Applications developed during the project, increasing at a rate of one Application per year thereafter. Because the benefits arise from the Applications, benefits accrue more quickly under the scenario considered for the licence area compared to that considered for GB scale		
Attachments			

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	02
Question date	16 August 2016	Answer date	18 august 2016
Submission section question relates to	Section 3 Benefits, Timeliness, and Partners		
Topic	Labour cost breakdown		
Question	Please provide a table with a breakdown of indicative day rates and person days for SPEN and each project partner. This should be based on the amount of person days required and proposed labour costs.		
Notes on question			
Answer	[redacted]		
Attachments			

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	03
Question date	19 August 2016	Answer date	22 august 2016
Submission section question relates to	Section 3 Project business case		
Topic	Cost Benefit Analysis		
Question	Please explain why the project forecasts negative financial benefits in 2030 for an individual deployment.		
Notes on question			
Answer	In accordance with the requirements of the NIC Governance we have considered the costs and benefits of an individual deployment, which is defined as *'replicating the Method, once it has been proven successful, at the scale being tested in the Project'.* However in the case of the INSPIRE method a BAU implementation at the small scale tested in the project would not be appropriate. The solution is appropriate to an enterprise wide implementation (Licensee Scale). Considering the artificial scenario of individual deployment; many of the costs associated with individual deployment (fixed costs) are similar to those associated with licensee scale deployment. However the benefits realised from individual deployment are considerably smaller than from licensee scale because the coverage in terms of scale and functionality is limited to that of the initial project trials. In summary, individual deployment as defined in the NIC Governance is not relevant to this type of solution and therefore considering this artificial scenario results in negative benefits being forecast for 2030. A positive CBA is achieved when licensee scale deployment is considered, representing a realistic scenario.		

Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	04
Question date	19 August 2016	Answer date	22 august 2016
Submission section question relates to	Section 4 Benefits, timeliness, and partners		
Topic	Travel and Expenses Budget		
Question	Please provide a description of how the travel and expenses budget has been determined. Please provide a breakdown of these costs if available.		
Notes on question			
Answer	We have based our travel and expenses budget on experience gained through our LCNF Tier 2 Accelarating Renewable Connections (ARC) project which is nearing completion. ARC undertook a successful programme of stakeholder engagement. One of the fundamental objectives of the INSPIRE project is to ensure its relevance to the other licensees and wider industry stakeholders through immediate and ongoing engagement. Therefore we believe that the travel and expenses costs for both projects will be similar. In the table 4-1 Work Package detailed information, it may be noted that the largest elements of travel and expenses costs are allocated against Project Setup and Knowledge Dissemination in line with our view above that considerable external engagement will be required in both these work packages.		
Attachments			

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	05
Question date	25 August 2016	Answer date	30 August 2016
Submission section question relates to	Section 3 Project business case		
Topic	NPV calculation		
Question	The Full Submission Guidance states 'Enough information should be included in this [NPV] summary so that it can be used in conjunction with the data in the Full Submission Spreadsheet to enable the Panel to independently calculate the Net Present Value of each Method.' Please direct us to where you have provided this information in your submission.		
Notes on question			
Answer	The financial benefits of the method are equivalent to the avoided conventional costs. The approach to how these were calculated for each exemplar use-case is explained in **Appendix B** including the assumptions made. This appendix also explains how the average benefit has been calculated and how this has been scaled up to licensee and GB scale. Benefits from 4 Use-cases are calculated for the 3 scenarios (post-trial, Licensee, and GB scale) and some benefits are profiled over the 30 year period in accordance with the underlying assumptions such as the transform model. We note that the Net Benefits section is not included in the Full Submission Spreadsheet template this year. In the pro-forma (due to space constraints and the limitations of the MS Word format) it has not been possible to detail every figure used in our calculations. For reference we attach an MS Excel spreadsheet containing our full CBA calculation. This has been annotated with diagrams from Appendix B in the submission to help with explaining the approach. We can provide any further clarification required.		

Attachments	 Copy of INSPIRE CBA based upon Ofg

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	06
Question date	25 August 2016	Answer date	30 August 2016
Submission section question relates to	Section 2 Project description		
Topic	Technical description		
Question	Is the system the development of a Network Model Manager(NMN) as described by EPRI? If it is not please be very specific about what this system will do differently from a NMN.		
Notes on question			
Answer	The WISP has a wider, and somewhat different scope, to that of the EPRI NMM recommendation: - 1. The current EPRI NMM requirements baseline is targeted at TSOs and focusses principally on the management of network topology/asset models from multiple sources such as adjoining TSOs and the incorporation of planned change models in order to produce modelling datasets for specific kinds of network study. The WISP, by contrast, needs to embrace a wider range of data domains, including for example customer premise, metering and detailed LCT data, and secondary SCADA communicationss topology. 2. The WISP incorporates the level of Master Data Management (MDM) facilities needed for a UK DNO where partitioned mastering of the network topology/asset dataset across the three core source systems is the norm. This incorporation of MDM is one of the key innovations that INSPIRE will trial, as we believe it will lead to more cost-effective solutions for delivering DNO/DSO IT/OT architectures.		

	3. The WISP aims to support a much wider range of smart grid application types than just modelling studies, as will be demonstrated by the four Use-cases. 4. The WISP will support a wider range of integration patterns than just CIM interfacing. There will always cases where the latter is not the most cost-effective solution. For example some of the WISP data will be stored in a format that is readily displayable as map layers by geospatial applications, including field terminals. To meet this type of requirement it is far better just to take the few small extra steps needed to hold the data in this way so it can be directly consumed by these applications rather than requiring it to be converted and immediately de-converted again. EPRI's NMM and INSPIRE's WISP do share an overall objective of providing a utility master data repository for use by network analysis tools in various utility divisions. However, EPRI´s NMM use case sketches given in [1] focus on transmission network planning and operation, whereas INSPIRE's WISP aims to address the transformation challenges in DNOs, where the traditionally passive distribution networks are becoming active by means of deploying smart grid technologies. Hence, further smart grid applications (such as Active Network Management) and additional source systems (such as a Communications Network Model and Historical Analogue Time-Series information) not considered in EPRI's technical report will be taken into account by INSPIRE when developing the WISP. It is worth noting that EPRI's technical report defines core or high-level NMM requirements, such as "The NMM shall provide CIM-based integration services that will allow the NMM to be integrated with other systems". Although NMM's high-level requirements will be taken into account as one of the references and starting points when defining WISP requirements in the early stages of INSPIRE, the specific technical requirements that will form the basis for the WISP development will be the result of a detailed requirements analysis covering the Use-cases and additional smart grid applications and data sources mentioned above. The project will take a pragmatic view when considering the EPRI NMM requirements and aim to make an iterative step towards meeting the analogous set of requirements that would be appropriate for a DNO or DSO.
Attachments	[1] Network Model Manager Technical Market Requirements: The Transmission Perspective. EPRI, Palo Alto, CA: 2014. 3002003053.

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	07
Question date	25 August 2016	Answer date	30 August 2016
Submission section question relates to	Section 4 Benefits,timeliness and partners		
Topic	Contingency		
Question	Your risk budget is 225K out of atotal 8517K, 2.6%. Do you think this is an appropriate level of contingency within a complex IT project?		
Notes on question			
Answer	It should also be noted that this is an innovation project and is charecterised by having a significant internal labour input from SPEN together with our licensee partner National Grid (GBSO). As we have close control over these costs and also those of our academic partner we believe that contingency in these areas is unlikely to be required. Whilst contingency is shown across the majority of project areas, when the overall contingency sum is considered in relation to contractor labour costs, where it is most likely to be required, it is approximately 5% of these. This is still an efficient allowance, however we believe that it is sufficient given the robust bottom-up costing process that we have employed in developing the project budget.		
Attachments			

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	08
Question date	25 August 2016	Answer date	30 August 2016
Submission section question relates to	Section 6 Project readiness		
Topic	Project readiness		
Question	What lessons has SPEN learned from other complex IT projects and how have you applied these learnings to INSPIRE, with specific reference to risk and contingency.		
Notes on question			
Answer	Although INSPIRE is an innovation project, implementing a trial solution, the project may be characterised as a systems integration project, and lessons can be learned from previous projects of this type. Some of the key learning points, and the INSPIRE response to these are outlined below: - • *There needs to be a strong commitment from top management:* - The project will be overseen by the Project Steering Board. Both our director of Engineering Services, Colin Taylor, and our director of Network Planning and Regulation, Scott Mathieson, will sit on the board and are committed to delivering the project. Between them, they have access to both the BAU and Innovation resources to ensure successful delivery. • *The lack of clear requirements definitions is the worst enemy of the correct implementation of such projects*: - Being aware of the importance of clear requirements definition, we have dedicated work		

	package WP1 to design optimisation. We will use a systems engineering approach to ensure that requirements reflect the business and technical requirements of all stakeholders. • *Business Processes must be considered from the beginning of the project:* - We have a track record in SPEN of using Lean Six Sigma techniques for business process improvement and have trained blackbelts who will assist in helping business users define the 'As-is' and 'To-be' business processes which will feed into the requirements specification. • *It has been found challenging to integrate proprietary IT systems. Systems have been integrated without considering how to integrate the data* – INSPIRE will take a data-centric approach, focussing on the information that the data represents and placing sufficient design focus on the data architecture/data modelling aspects. We will make data available in an open and standard manner. • *Despite best efforts, it can become apparent during project implementation, that the deliverables are not in line with user requirements:* - We will adopt an agile approach to delivery in INSPIRE. Rather than considering the project as a single large deliverable, it is broken down into a set of smaller iterations known as sprints. This method allows for continuous delivery of useful products/software and allows feedback from business users to be addressed during the next sprint. By implementing the above techniques together with adherence to a formal project management process that ensures issues and risks are identified and escalated timeously, we believe that we have the foundations in place to manage risk and therefore remain within the efficient contingency allowance requested.
Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	09
Question date	25 August 2016	Answer date	30 August 2016
Submission section question relates to	Section 4 Benefits, timeliness and partners		
Topic	Cost breakdown		
Question	You have £167K for equipment and £657K for IT. Provide detail of what this is and why it is needed		
Notes on question			
Answer	£167k for equipment is primarily associated with Use-case 3 – Improved Network Performance via Data Analytics. The exemplar case requires additional RTUs and a field-data adapter to be installed in order to bring back analogue data from existing pole Mounted Auto Reclosers. £657k for IT: - Given the nature of this project, we have used this heading for the **ICT infrastructure** required for the project including hardware, software, and services. This is being provided through our corporate IT department, Systems UK, using existing commercial framework agreements that they have in place, and includes Systems UK project management costs. As stated in Section 2.2.4 of the submission we believe it is important to host the trial on typical DNO ICT infrastructure so that it is as close as practicable to emulating a BAU solution. A summary is included below: -		

	[redacted]	
Attachments		

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	10
Question date	25 August 2016	Answer date	30 August 2016
Submission section question relates to	Section 2 Project description		
Topic	Technical description		
Question	If it is what other NMN packages has SPEN investigated and rejected? What reasons are there for the rejection of existing NMNs?		
Notes on question			
Answer	As stated in our answer to Question 6, INSPIRE's WISP will provide additional/different functionality comaperd to that functionalty recommended by EPRI. As a consequence, the commercial NMM packages available on the market do not cover all the functionalities of INSPIRE's WISP. It should be emphasised that this project is not just about technology, it is about understanding how it can be effectively used in a DNO in a repeatable manner exemplified by some sample use cases. INSPIRE will start from the problem space and identify the appropriate architecture, designs and technologies to deliver a solution fit for purpose for DNOs/DSOs – rather than one constrained by existing proprietary products. Our design work may well direct us to use some off-the-shelf technologies if they meet our implementation needs.		
Attachments			

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	11
Question date	25 August 2016	Answer date	30 August 2016
Submission section question relates to	Section 4 Benefits, timeliness and partners		
Topic	Procurement		
Question	Has SPEN issued an RFI through any procurement process, Achiles or other, for these services? If not why not?		
Notes on question			
Answer	As stated in our submission, one of the fundamental objectives of INSPIRE is to open up the market for developing Applications to SMEs, academic institutions and others, and to avoid the lock-in to proprietary systems of large vendors. To this end we have been consulting widely with industry and academia to raise the profile and opportunities for participation associated with the project, including an open stakeholder event in London on 09 May. Upon award of funding, formal procurement activities will commence including competitive selection of project partners and suppliers where appropriate to ensure value for money for existing and future customers. As we require partners rather than just vendors it is not always appropriate to use Achiles. Feedback from stakeholders and experience from within the business is an effective way to shortlist potential bidders. For our DINO project which preceded INSPIRE we invited 13 parties to bid to become the project partner. CGI were ultimately successful through this process. As a result of this, and continued successful delivery of DINO, together with their experience on previous innovation projects as explained in the submission we intend that CGI will be the main technical partner in INSPIRE. We will need to use the services of existing core system vendors in some		

	instances to achieve the necessary interfaces to their products.
Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	12
Question date	25 August 2016	Answer date	30 August 2016
Submission section question relates to	Section 2 Project description		
Topic	Technical description		
Question	You state that CIM does not cover off every identifier usd in the GB electricity industry at present. Do you believe that CIM extensions will be able to fill this perceived gap? If so will you be feeding these extensions back into the standards making process through the BSI's representation on CIM?		
Notes on question			
Answer	INSPIRE will analyse whether the Use Cases covered by the project require additional classes, attributes and relationships that are not currently part of the CIM and will extend the model as necessary in order to fill the identified gaps. It is planned that the CIM extensions performed by INSPIRE will be first presented at the meetings organised by the official CIM User Group (http://cimug.ucaiug.org/default.aspx), where the extensions will be discussed with industry partners and the IEC TC57 WG13 & WG14 convenors and experts. Based on these discussions, INSPIRE will officially propose the necessary CIM extensions to the IEC TC57 WG13 & WG14 through their mirror committees at the BSI with the aim of filling the identified gaps between the CIM and the GB electricity industry.		
Attachments			

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	13
Question date	25 August 2016	Answer date	30 August 2016
Submission section question relates to	Section 2 Project description		
Topic	Technical description		
Question	You state that CIM has limitations due to the requirement for UUIDs. Is this limitation not in fact down to the same issue you would face with any mutli-vendor integration issue. If it is not then how would you get around this using other standards or software packages?		
Notes on question			
Answer	We agree that ID management issues do not occur only in CIM-based integrations but need to be dealt with in any multi-vendor integration. In fact, since version 15 the CIM includes classes that enable the representation of several names given by different authorities to the same object –identified with a unique UUID. That is, the CIM helps solve ID issues. ***However, something in the overall solution still has to manage the allocation of UUIDs to CIM objects***, and certainly not all of the core application products currently used by DNOs would be able to do this without core product modifications, assuming the vendors are willing to make these. Adopting the CIM (or any other standard data model) does not resolve the ID management issues by itself. Appropriate Master Data Management (MDM) facilities are also required so as to establish and maintain the mappings between the different representations of the identified objects. It is one of the objectives of INSPIRE's WISP to provide such MDM facilities and this is one of the project's key innovations.		

Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	14
Question date	25 August 2016	Answer date	1 September 2016
Submission section question relates to	Section 2 project description		
Topic	Technical description		
Question	You propose to create your own data translators (CIM) to interface between the WISP and each of the core systems (GIS, DMS etc.). Why have you chosen to do this rather than utilise pre-existing translators/adaptors from the OEM vendors?		
Notes on question			
Answer	For clarification, we do not propose to create our own data translators (CIM) to interface between the WISP and each of the core systems. INSPIRE will use straightforward Extract, Transform and Load (ETL) mappings, not CIM adapters, for transferring master data between the core source systems and the WISP.We believe this is the optimum solution in terms of complexity and cost. We would further clarify that the resulting WISP reference model will be translated into CIM, thus providing an open and standardised interface to third-party applications and any other systems as required. This is part of the innovative approach being trialled under INSPIRE. Further explanation of the rationale behind this approach follows:- CIM adapters that could be used directly out of the box, without significant further configuration or customisation, are not available for any of the existing master source systems to which the WISP will need to interface. For some of the core system products used by SPEN or other DNOs, particularly		

	where products serve wider marketplaces than just the power industry, no CIM adapters are currenty available. For example there is no such support for SAP, which is the platform for SPEN's Enterprise Asset Management solution and hence a key data mastering system. See also our response to Q17 below. (Other legacy applications may never have CIM support, but the INSPIRE methodology allows even these applications to be fully integrated.) For other core system product platforms, the suppliers' proposed approaches to applying CIM adapters involve considerable complexity. For ESRI, available CIM adapters typically require the use of a related, electricity-specifc data model provided as layered add-ons. SPEN have implemented their ESRI solution using Schneider's ArcFM add-on for which there is currently no explicit CIM support. A further add-on is available from Safe Software for supporting CIM, this is (a) only a toolkit, with no specific data model included so the data-model-specific configuration/customisation then has to be applied to it by its users, and (b) operates using an ETL platform rather than within the framework of an SOA adapter. Translating data between application and CIM format is quite complex as each application's data structures are typically designed to optimise the application's own functionality. At some stage in this process the application's individual data entities and fields have to be mapped to/from their CIM counterparts. Though CIM clearly offers many benefits, INSPIRE will take a pragmatic approach to implementing it, using more cost-effective methods where appropriate as in this case. Conversion to CIM format in the core source systems before transmission to WISP is not considered essential because this is not necessary for the delivery of a sufficiently open and re-usable solution architecture. WISP will therefore trial the simpler and innovative approach of mapping each set of source data into a common reference model, and reconciling the various sources, beforehand. This reference model is based on CIM but is simpler and more generic, taking advantage of facilities provided by modern database technologies to simplify and optimise the process of these data translations. The final step, of translating this WISP reference model into CIM can then be done once only and in a single place. (Note also that the CIM standards do not prescribe how data should be stored in individual system databases – they define data interchange formats only.) Even if all the core systems were comprehensively CIM-compliant it would still be necessary to provide centralised facilities that synchronise the source systems and map and maintain the mappings between different CIM versions and extensions used by the core systems and applications. A further objective of INSPIRE's WISP is to incorporate these facilities, so enabling DNOs to centrally integrate their core systems without having to modify or replace their adapters, and facilitating the task of mapping and synchronising them.
Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	15
Question date	25 August 2016	Answer date	1 September 2016
Submission section question relates to	Section 2 Project description		
Topic	Technical description		
Question	Have you discussed this with the vendors and found they are unable or unwilling to do so? GE and ESRI have provided letters of support to the project yet there is no metion of utilising their CIM export capabilities, we are curious as to why not.		
Notes on question			
Answer	As explained in the answer to question 14, CIM will not be used for transmitting network master data from the core source systems to the WISP.		
Attachments			

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	16
Question date	25 August 2016	Answer date	1 September 2016
Submission section question relates to	Section 2 Project description		
Topic	Technical description		
Question	If you produce your own adaptors how will these be kept up to date when core systems change in future? Will the WISP have to have new adaptors created to manage changes in core systems? If so who will carry out the upgrades?		
Notes on question			
Answer	As explained in the answer to question 14, CIM will not be used for transmitting network master data from the core source systems to the WISP. Future changes to core systems may lead to the need to update the interfaces between those core systems and the WISP. Translator updates are expected to be limited to simple configuration changes because the source interfaces will be configurable ETL processes rather than more complex CIM conversions. These may need updating when core system changes (either core product platform upgrades or any other type of data configuration – see our response to Q17 below) but this will mostly be simple configuration changes rather than anything more invasive. These changes would also be relatively rare, as only a major product upgrade that involved transformations to its core data model, or a business change project to utilise more or fewer of the product's facilities, would be likely to impact these data mappings.		

	Any changes needed would be made by either the WSIP developer or whoever was subsequently made responsible for the 2nd-line application support of its live implementation – the latter party would be capable of making configuration changes. One of the benefits of INSPIRE over multiple point-to-point solutions is that only one interface needs to be updated rather than multiple interfaces.
Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	17
Question date	25 August 2016	Answer date	1 September 2016
Submission section question relates to	Section 2 Project description		
Topic	Technical description		
Question	If you produce your own adaptors how will you enure that they have full access to the model data held within the core systems databases as often the data is in a proprietary format or restricted in some way. Will there be significant reverse engineering needed to create these adaptors?		
Notes on question			
Answer	As explained in the answer to question 14, CIM will not be used for transmitting network master data from the core source systems to the WISP. INSPIRE's WISP will have full access to source data by mapping it to a canonical data model via configuration tables that can be updated by suitably privileged users. Regardless of their undelying, proprietary *physical* data models, all three of SPEN's current core systems – PowerOn, ESRI and SAP – embody *business* data models that can either be configured or customised by either the users or their IT support teams. Both PowerOn and SAP allow the data they hold to be configured dynamically by suitably privileged users. Data can be extracted from these systems in line with these business data models by various methods according to the product in question. In our technical partner, CGI's, experience, the same is also true of all other GIS and Enterprise Asset Management product platforms. (Further to our answer to question 14, the flexibility of data modelling that these core systems embody also means that the product vendors cannot provide fully out-of-the-box CIM adapters themselves, as such an adapter would rely on an underlying fixed data model which these products have deliberately avoided having. The most the product vendors can provide in these circumstances is a toolkit which will then require		

	some additional configuration and customisation for each client implementation.)
Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	18
Question date	25 August 2016	Answer date	1 September 2016
Submission section question relates to	Section 2 Project description		
Topic	Technical description		
Question	If the adaptors are created how will you ensure their efficacy and accuracy?		
Notes on question			
Answer	As explained in the answer to question 14, CIM will not be used for transmitting network master data from the core source systems to the WISP. The accuracy and completeness of all INSPIRE's data translations will be established by comprehensive testing conducted on the project. The same type of testing will be required for adapters created as part of the project and for vendor product-specific adapters. CIM documents generated by the WISP to populate external applications will be validated by performing interoperability tests taking advantage of available validation tools – such as the CIMTool and the CIMSpy - for WISP CIM export files, and following similar processes to those used by ENTSO-E's Conformity Assessment Framework, where validation rules which are used to check the syntax and power flow calculations are performed before and after the translations to validate the content of the files. Checks on accuracy would be required even if adapters that require no client-specific configuration or customisation were available.		

Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	19
Question date	25 August 2016	Answer date	1 September 2016
Submission section question relates to	Project Description		
Topic	Technical description		
Question	You state that granularity is needed in the model and that the WISP will produce abstractions from a maximum detail model. Is this not the same functionality that exists inany network management system/analysis package?		
Notes on question			
Answer	This is not the same as typically exists in the applications mentioned. Existing applications do not have aligned, multi-domain master-data models of the whole distribution system with the breadth and depth that the WISP will provide. Instead they typically have a single-domain, partial, and often simplified, perspective on the whole distribution system, driven (quite correctly) from that application's data requirements. The INPSIRE WISP approach is both cross-system and cross data domain, which will become increasingly necessary for Smart Grid operation using FPSA as a reference architecture. INSPIRE will bring together abstractions of detailed data to provide intelligence efficiently covering a wide range of business processes. It could be said that power systems analysis packages abstract data when they use only system impedance and loading data to undertake a load flow, whilst ignoring transient behaviour parameters. The main difference is the range of functions; INSPIRE will facilitate applications beyond network analysis by interfacting with wider detailed data sources. To give one example, Distribution Management Systems such as PowerOn typically represent cables and overhead lines between sites as simple connectors, without		

	holding the geographical details of cable and overhead line routes. Network modelling/analysis packages can either import models or work on data held in their own databases and maintained either manually or via interfaces from other systems, but do not contain facilities for producing further abstractions. The latter is a NMM function. We are aware there are certain products currently available that do perform this function, such as CIMphony, and are intending to examine these to see if they are suitable for use to deliver this aspect of the WISP facility. This is an inherent approach in our methodology for the project in that we will seek to use existing technology where it meets the business goals identified. We believe this use of technology, rather than technology per se, is innovative.
Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	20
Question date	25 August 2016	Answer date	1 September 2016
Submission section question relates to	Section 2 Project description		
Topic	Technical description		
Question	You state that this system will assist with versioning issues, specifically with future versions. How will the WISP handle future versions of CIM especially if the adaptors are within the WISP and not provided by the OEM vendors of the core systems?		
Notes on question			
Answer	As explained in the answer to question 14, CIM will not be used for transmitting network master data from the core source systems to the WISP, therefore this question concerning future versions of CIM is not applicable to these interfaces. However it is recognised that the question is also applicable to CIM conversions carried out on the WISP reference model for interfaces to new applications and further systems as required. This will be handled as follows. What INSPIRE's WISP proposes is to provide centralised model-driven MDM facilities that enable the DNO to establish and maintain mappings between the core systems without having to modify, replace, update or build new adapters in each of the systems and smart grid applications. We contend that system-wide data management can be more effectively facilitated in one place. The WISP data can be made available in other required formats additional to CIM, and in different versions of CIM if required to support the other applications, e.g. we would have the ability to export CIM v14 data to one application/system, CIM v17 data to another.		

Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	21
Question date	25 August 2016	Answer date	1 September 2016
Submission section question relates to	Appendix K Links to other innovation projects		
Topic	OASIS		
Question	Please provide any technical information available related to project OASIS?		
Notes on question			
Answer	Office and Site Integration System (OASIS) was a SPEN business programme designed to replace a number of the core IT systems that was ultimately terminated around a decade ago. The ICT landscape within SPEN has changed completely in the intervening period, as core systems have been replaced and upgraded. The challenges and opportunities associated with the emerging smart grid that we are addressing now were not a factor 10 years ago. The purpose, scope and approach of OASIS were all different to INSPIRE. INSPIRE is very much a use-case, business problem led activity rather than an IT programme. Nonetheless, OASIS did included ambitious plans for systems integration and intended to use CIM, so some observations on our understanding of technical information related to OASIS are relevant to consider: - • The OASIS proposal included a Service Oriented Architecture (SOA) with full-width Enterprise Service Bus, replacing core systems with CIM compliant alternatives or installing CIM adapters.		

	• The prohibitive cost estimates associated with this approach were, we understand, a significant factor in the programme being terminated. • INSPIRE will not replace core systems or require invasive upgradesINSPIRE will implement a cost-effective architecture which takes full advantage of the benefits of CIM – i.e. interoperability and scalability - without incurring the major costs of modifying core IT systems.
Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	22
Question date	25 August 2016	Answer date	6 September 2016
Submission section question relates to	Section 2 Project description		
Topic	Technical description		
Question	The proposal states that the WISP is taking a reference copy and that mastering is in each of the core systems as silos. How does this approach improve current data entry requirements?		
Notes on question			
Answer	Our approach improves the quality of data entered by adding an additional layer of post-entry validation. Our base principle is not to fundamentally change the operational practices and systems involved in maintaining the current as-built network master data model, and in particular to avoid the need for invasive changes to the source systems, so the data maintenance facilities of these systems will not be changed. However if an update entered into one or the core systems leads to discrepancies with data held in others, the WISP will identify this when it receives its copy and will log a new data issue record for it. [redacted] [redacted] the issues will then be reported back to the data		

	stewards so they can be actioned as required. This is a very good example of where our proposed combination of model management and MDM techniques is innovative. This data validation approach is also applied to all the data that had been entered into the source systems beforehand, and thus addresses data throughout its full information lifecycle rather than just at its point of entry. A future development beyond the scope of this project would be to configure workflows for specific issue types using a Business Process Management (BPM) platform coupled to the WISP to automatically correct data anomalies in the core systems. In future, additionally, the INSPIRE solution architecture will enable the amount of duplicated data entry to be considerably reduced. Please see our responses to Q23 and Q28 for further information about this and why we have not included this additional automation in the current scope of INSPIRE. A key learning from this project will be how well the WISP's MDM and data quality management mechanisms work in practice in a real DNO environment.
Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	23
Question date	25 August 2016	Answer date	6 September 2016
Submission section question relates to	Section 2 project description		
Topic	Technical description		
Question	If data is mastered in each of the core systems how does the WISP help reduce duplication of effort, does a transformer still have to be described separately in multiple systems manually or is there a way the WISP helps with this data entry issue?		
Notes on question			
Answer	Our base principle is not to fundamentally change the operational practices and systems involved in maintaining the current as-built network master data model, and in particular to avoid the need for invasive changes to the source systems, so the data entry facilities of these systems will not be changed by this project. Beyond this project, the WISP can be developed to allow data from its reference model to be transmitted back to core systems other than the one from which it has been entered – please see our response to Q28 for further information. For example, the geographical and conductor type information mastered in the GIS for overhead lines and cables can be used directly to populate the corresponding information into the Distribution Management System (DMS) (which is usually able to accept it in a more concise format, typically without needing either the actual geographical routes of the conductors or any information regarding intermediate straight-through joints or section poles/towers). The WISP adopts the basic principle that each item of business data is mastered in one place only – but provides flexibility to allow different systems to master different		

	attribution of the same element. So, for example, a pole's map coordinates can be mastered in the GIS while its composition and condition grade are mastered in the Enterprise Asset Management (EAM) system – and either of these can then be replicated to the other systems if they want to hold these to support specific items of functionality or user visualisations. Ultimately, therefore, the WISP would lead to a reduction, almost to the point of elimination, of the same data having to be manually entered into two or more systems.
Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	24
Question date	25 August 2016	Answer date	6 September 2016
Submission section question relates to	Section 2 project description		
Topic	Technical description		
Question	If data still has to be entreed multiple times how would the WISP assist with scaling from X systems now to Y systems in future?		
Notes on question			
Answer	Please see our answer to question 23. Each piece of business data would only need to be entered into one source system, and can then be replicated to multiple other systems that wish to use it. (This replication can either be done routinely, for systems that want to hold local copies in their databases, or on demand by request, and this data can be made available either in CIM format or via other methods.) The WISP's single common reference model for master data is a key enabler of this capability.		
Attachments			

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Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	25
Question date	25 August 2016	Answer date	6 September 2016
Submission section question relates to	Section 2 project description		
Topic	Technical description		
Question	Is data entry to each silo manual? If so how does this method manage the risks inherent with manual data entry across multiple systems? How does this improve on the current methods used across multiple systems?		
Notes on question			
Answer	As explained in our response to Q22, INSPIRE is not proposing to change the data entry and maintenance mechanisms of the source systems. So data entry to each system will continue to be made using whatever methods the system currently supports. In addition to local data entry, these methods can include • manual entry by field staff via their mobile devices, • collection by semi-automated methods such as barcode scanning or RFID recognition, or • receipt of data electronically from supply chain participants, eg for asset nameplate and/or acceptance test data. The improvements the WISP offers on current data entry methods are described in our responses to Questions22-24 .		

Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	26
Question date	25 August 2016	Answer date	6 September 2016
Submission section question relates to	Section 2 Project description		
Topic	Technical description		
Question	Is the reference copy in the WISP updated manually or automatically?		
Notes on question			
Answer	Automatically – this is a key WISP innovation. The operational efficiency of maintaining this system is a key learning for the project.		
Attachments			

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	27
Question date	25 August 2016	Answer date	6 September 2016
Submission section question relates to	Section 2 Project description		
Topic	Technical description		
Question	How does the WISP help ensure that the data in the silos is in sync and up to date?		
Notes on question			
Answer	Please see first our answer to Q22 above, which explains how WISP responds to data discrepancies between the core systems when it detects these. A typical example would be: - A new secondary substation is built, with a nearby 11kV feeder being split and the resulting two cable ends extended to the two ring switches in the new substation. The Distribution Management System (DMS) will need to have its topology data updated at the point of commissioning, but the actual geographical details of the new cable routes in GIS may not be entered until slightly later. Until they are, the WISP will identify discrepancies in the two systems' network topologies and log this as an issue. [redacted] this outstanding discrepancy is reported to the data stewards. It is very useful for the DNO to have such discrepancies highlighted.		
Attachments			

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	28
Question date	25 August 2016	Answer date	6 September 2016
Submission section question relates to	Section 2 Project description		
Topic	Technical description		
Question	If errors are found in the INM how and where are the fixed applied? In the INM or in the siloed systems? Is this process manual or automatic?		
Notes on question			
Answer	On the understanding that this refers to data errors, initially most corrections will need to be applied to the source systems, and in many cases manually. The WISP will, however, provide some additional facilities for managing record mismatches between systems, where for example their common identifier values have been mis-transcribed in one or other of the source systems. For this type of issue, the WISP embodies data matching screens, supported where appropriate by semi-automated methods [redacted] that enable [redacted] matching entries to be captured [redacted] These changes can then be communicated back to the source system(s). There are key learnings emerging from the DINO project that will ensure the WISP provides assistance with, and some automation of, the processes involved in maintaining high-quality master data. Beyond this project it will also be possible to complement the core solution [redacted] so that		

	certain types of error discovered when reconciling source datasets or by inferencing could be automatically fed back to the relevant source systems. We have not included this automation in the scope of INSPIRE, because the business users and data owners would be very unlikely to trust their data to an automated innovative technology solution at the outset. For this project, therefore, we plan for the data stewards to make the agreed corrections manually, either by correcting the source data directly or by using data matching or similar facilities that WSIP will incorporate. As the users gain experience of the WISP, and their confidence in it grows, we anticipate a requirement for the more mechanical of these corrections to be fully automated, which will be readily achievable in the INSPIRE architecture.
Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	29
Question date	25 August 2016	Answer date	6 September 2016
Submission section question relates to	Section 2 Project description		
Topic	Technical description		
Question	You state there are overlapping standards with CIM, specifically IEC61850. Are you aware of the harmonization work going on at present by the IEC in this area? If so how will SPEN engage with this and feed into the standards making process?		
Notes on question			
Answer	We are aware of the work carried out by the IEC TC57 WG19 under the technical specification IEC 62361 Part 102 – Interoperability in the long term – CIM-IEC 61850 Harmonization. The CIM-IEC 61850 harmonization task started in 2003 and the first public edition of the technical specification is expected in March 2017. This shows the complexity of the problem and the difficulties that the IEC TC57 WG19 CIM-61850 task force is facing, namely the completely different structures and initial set of requirements of the IEC 61850 (originating in the Substation Automation domain) and the CIM (initially developed for EMS/DMS systems), and no availability of the IEC 61850 UML data model, which is for internal use only within the IEC TC57 WG10 for creating IEC 61850 standards consistently. The technical specification IEC 62361 Part 102, currently a Circulated Draft Technical Specification (CDTS), will provide guidelines on how to integrate CIM and IEC 61850 systems, as well as recommendations to the IEC TC57 WG13/14 and IEC TC57 WG 10 to extend and/or modify the CIM and the IEC 61850, respectively, with the aim of		

	facilitating the integration in future versions of the standards. The guidelines will define Use Cases of possible interactions between IEC 61850-based and CIM-based systems. As of January 2016, only one of the Use Cases (the configuration of CIM EMS/DMS applications from IEC 61850 SCL configuration files) was completed, but other candidate Use Cases were enumerated, such as Wide Area protection and control, Voltage-Var Control and DER Use Cases. For each Use Case, the guidelines will provide a table describing the proposed mappings between IEC 61850 SCL and CIM. Taking advantage of the position of INSPIRE partners as members of the IEC TC57 WG19, it will be possible to access the latest version of the IEC 62361 Part 102 and where appropriate use it's guidelines as a reference and starting point to carry out particular integrations within the WISP. Where appropriate we will provide feedback to the IEC TC57 WG19 so as to improve the mappings recommended in the guidelines. The recommendations arising from learning on innovation projects such as INSPIRE are very beneficial to the IEC TC57 WG19 task force as the group is very keen to receive feedback on real experiences using the proposed mappings as well as on new applications not included in the guidelines.
Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	30
Question date	08 september 2016	Answer date	13 September 2016
Submission section question relates to	Section 5 – Knowledge dissemination		
Topic	Engagement with other licensees		
Question	Please provide further details on the planned level of engagement with the GB DNOs and TOs. Please provide in full the letters of support received from network licensees. Please explain whether or not a letter of support has been received from UKPN.		
Notes on question			
Answer	Engagement activities have already commenced, including the stakeholder event at the IET, on 09- May to which all other network licensees were invited. The details of the event have been recorded under *Appendix M on Page.91* in the Full Proposal As stated in the Full Proposal, the planned level of engagement with other licensees is as follows: - • INSPIRE steering Committee – The GBSO as one of our project partners will be represented on the committee, along with other key stakeholders such as the Energy Systems Catapult, giving them a role in the highest level of project governance. Meetings will be scheduled quarterly. • Industry Collaborative Working Group – All of the other network licensees will be invited to participate in this group along with wider industry stakeholders including the supplier community and academia. Workshops will commence at the beginning of the project		

	to help inform the detailed specification developed in Work Package 1. Subsequent events will be planned on a twice yearly basis to contribute to the detail of the learning objectives and ensure that relevance of the learning is maximised. • LCNI Conferences – We will participate in the annual LCNI conferences which give the opportunity to share learning with a larger audience of licensee attendees. A copy of the letters of support received from network licensees is attached. Re: UKPN letter: The INSPIRE team value and have followed the advice from Ofgem, dated 24-May post the ISP publication: '*as part of the full submission process you could liaise with other licensees who have looked into running similar projects to ensure no research is duplicated and thus the project delivers the best value to consumers.*' As part of that exercise we liased with GBSO and UKPN in relation to the TDI 2.0 project proposal. A meeting was held with UKPN. A subsequent meeting was arranged with TDI 2.0, the joint project team from UKPN and GBSO, to understand whether there is any duplication and how the companies can work together. It was then agreed that a letter of support, approved by both GBSO and UKPN, was supplied in the name of TDI 2.0. Please see *the confirmation email* from Dr. Biljana Stojkovska, the TDI 2.0 proposal lead. GBSO later became a Partner in the INSPIRE project to maximise the value of INSPIRE, and their corresponding activities are under leadership of Ms. Tracy Thompson
Attachments	 Q30 INSPIRE letters of support Licensee o  Q 30 Letter of Support from TDI 2 tc

INSPIRE's Letters of Support (Licensee only)

National Grid

nationalgrid

Watson Peat
Future Networks
SP Energy Networks
10 Technology Avenue
Hamilton International Technology Park
Blantyre, G72 0HT

25th July 2016

Ref: INSPIRE NIC Project

Dear Watson,

This letter is in support of the INSPIRE project, to be submitted to OFGEM within the Network Innovation Competition framework.

Project team from TDI 2.0 look forward to sharing learning from the INPISRE projects outputs and we will participate in the INSPIRE knowledge dissemination events.

Yours Faithfully,

Dr. Biljana Stojkovska
Innovation Manager
System Operator, National Grid

Electricity North West

Electricity North West
304 Bridgewater Place, Birchwood Park
Warrington, Cheshire WA3 6XG

Telephone: +44(0) 843 311 4500
Fax: +44(0) 843 311 5119
Email: enquiries@enwl.co.uk
Web: www.enwl.co.uk

[redacted]

Watson Peat
Future Networks
SP Energy Networks
10 Technology Avenue
Hamilton International Technology Park
Blantyre
G72 0HT

27th June 2016

Dear Watson

INSPIRE NIC Project

This letter is in support of the INSPIRE project, to be submitted by SP Energy Networks to OFGEM within the 2016 Network Innovation Competition.

We consider that if successful the potential benefits of this project could include: -

- Optimising the planning and operation of multiple smart grid technologies,
- Develop a transferable, standard information platform architecture which may introduce cost efficiencies
- Use of data analytics to improve system operation
- A vendor agnostic approach that stimulates competition and therefore savings to customers,

We have agreed to participate in the proposed Industry Stakeholder Group and we look forward to sharing learning from the project outputs and participating in the stakeholder consultation and knowledge dissemination events.

Yours sincerely

Dan Randles

Digitally signed by Dan Randles
CN=Dan Randles
C=GB - UNITED KINGDOM
O=Electricity Northwest
E=dan.randles@enwl.co.uk

Dan Randles
Engineering Strategy Manager

Northern Powergrid

98 Aketon Road
Castleford
WF10 5DS

[redacted]

Watson Peat
Future Networks
SP Energy Networks
10 Technology Avenue
Hamilton International Technology Park
Blantyre
G72 0HT

28 July 2016

Dear Watson

SUPPORT FOR INSPIRE PROJECT

This letter is in support of the INSPIRE project, to be submitted to Ofgem within the Network Innovation Competition framework.

Achieving UK policy objectives on carbon reduction, energy security and affordability will affect the electricity system in terms of increased volume of intermittent generation, the electrification of heating and transport, and the integration and optimisation of distributed energy resources. Consequently future distribution networks will be characterised by greatly increased complexity, interaction and dynamism. Designing and managing these networks effectively will require advances in data management and in extracting intelligence from the data.

We recognise that INSPIRE's objective is to develop and test alternative information systems architecture to meet these challenges, with demonstration in four specific areas:

- Co-ordinating the application of smart grid techniques
- Improved network visibility for third parties
- Improved network availability and asset management through the use of data analytics
- Improved network understanding for designers

We note and support the intention to develop this information architecture based around the Common Information Model IEC 61968. This will help to make the developed solution, the Whole System Information Platform, transferrable and reusable by other DNOs and also provide a standard platform against which third party vendors can develop further applications. We support this approach as, dependent upon wider adoption by the industry of a standard information platform, it could provide the environment for the growth of a market in 'plug and play' applications for a range of current and future DNO functions.

While this has the potential to deliver advantages, in order to evaluate the potential for its adoption by Northern Powergrid we would need to understand whether the new approach

developed and demonstrated by INSPIRE is higher benefit and/or lower cost/risk than alternatives such as point-to-point or service-oriented architecture. We would therefore like to see the outputs from the project include a quantitative and qualitative assessment and comparison of these approaches.

We consider INSPIRE to be fundamentally an information systems project with some content that is DNO-generic. However, to effectively demonstrate the method through trialling the use cases, there is inevitably some content that is SPEN-specific, in particular the interfaces between the Integrated Network Model and existing SPEN systems. In order to maximise the transferability and interoperability of those elements that are generic, and to assist other DNOs in adopting this solution, we consider it necessary for the details of the database and interface design to be made available to other DNOs as outputs from the project. To this end, we welcome the project's adherence to the default IPR arrangements and support for this principle.

We look forward to evaluating the learning from the INSPIRE project, and wish SPEN success in this venture.

Yours sincerely

Jim Cardwell
Head of Trading and Innovation

Western Power Distribution

WESTERN POWER DISTRIBUTION
Serving the Midlands, South West and Wales

Watson Peat
Future Networks
SP Energy Networks
10 Technology Avenue
Hamilton International Technology Park
Blantyre, G72 0HT

Avonbank
Feeder Rd
Bristol
BS2 0TB

[redacted]

Our Ref	*Your Ref*	*Extension*	*Date*
			19th July 2016

Ref: INSPIRE NIC Project

Dear Watson,

This letter is in support of the INSPIRE project, to be submitted to OFGEM within the Network Innovation Competition framework.

We are in support of the INSPIRE project objectives of developing an information system that enables the functionality required from the future distribution network.
We believe the potential benefits to DNOs include: -

- Optimising the planning and operation of multiple smart grid technologies, and enabling their integration into existing networks,
- Cost efficiencies through developing a standard information platform architecture which is transferrable, and could be replicable to all GB Networks,
- Releases the potential of data analytics to improve system operation,
- A vendor agnostic approach that stimulates competition and maximises savings to customers,
- Flexibility to meet as-yet unknown requirements (future proofing),

We look forward to sharing learning from the projects outputs and we will participate in the INSPIRE stakeholder consultation and knowledge dissemination events. We also confirm that we will participate in the proposed Industry Stakeholder Group.

Yours Faithfully,

Mark Dale
Innovation and Low Carbon Networks Engineer
[redacted]

SSEPD

Scottish and Southern Energy
Power Distribution

Watson Peat
Future Networks
SP Energy Networks
10 Technology Avenue
Hamilton International Technology Park
Blantyre, G72 0HT

Ref: INSPIRE NIC Project

Dear Watson,

This letter is to confirm SSEPDs interest in the development and delivery of the INSPIRE project . Better managing network data is obviously a key element of the delivery of a successful Smart Grid. This will be essential to GB achieving its carbon targets and also delivering benefits for customers. The INSPIRE project is obviously looking to deliver learning in this area.

SSEPD are already progressing work to investigate new methods of better utilising data to improve network management, therefore, we would strongly recommend that SPEN consider the outputs form both our DISCERN and New Thames Valley Vision projects. This should help SPEN better define the scope of the INSPIRE project and avoid any unnecessary duplication.

We look forward to sharing learning from the projects outputs and we will participate in the INSPIRE stakeholder consultation and knowledge dissemination events.

If you wish to consider any further information please do not hesitate to contact either myself or Frank Clifton at fnp.pmo@sse.com.

Yours Faithfully,

Stewart A Reid
Head of Asset Management and Innovation.

For and on behalf of SHE Transmission

SGN

Watson Peat
Future Networks
SP Energy Networks
10 Technology Avenue
Hamilton International Technology Park
Blantyre, G72 0HT

8th July 2016

Ref: INSPIRE NIC Project

Dear Watson,

This letter is in support of the INSPIRE project, to be submitted to OFGEM within the Network Innovation Competition framework.

At SGN, we recognise that the GB gas and electricity networks needs to become more flexible and intelligent to meet the requirements of future varied and changing scenarios.

We believe that more intelligent networks can help to manage our constraints and deliver a more efficient, reliable, affordable, lower carbon supply to our customers in the future.

SGN are keen to share in the learning for this exciting innovative project and similarly would like to share the lessons learned from our Real-Time Networks NIC project. We believe the projects to be complimentary and together could provide significant learning for the whole GB energy distribution system.

We look forward to sharing learning from the projects outputs and we will participate in the INSPIRE stakeholder consultation and knowledge dissemination events.

Yours Faithfully,

Alexander Webb

Real-Time Networks Project Manager

SGN

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	31
Question date	08 september 2016	Answer date	13 September 2016
Submission section question relates to	Section 6 – Project readiness		
Topic	Future Rollout		
Question	Please describe and provide information on the work undertaken so far to understand the diversity of DNO and TO systems that will need to be accommodated. Please explain the degree to which the project intends to harmonise interfaces of the same functional systems (such as, for example, network planning tools).		
Notes on question			
Answer	Regarding the work undertaken so far to understand the diversity of DNO and TO systems: - The INSPIRE team has carried out extensive stakeholder engagement with DNOs and TOs to understand the diversity of their systems. To give some examples: a dedicated visit to Electricity Northwest was carried out to ensure that what is proposed under INSPIRE is of value to them despite that they are not using the same NMS as SPD; Three teleconferences with Northern Power Grid confirmed the value of INSPIRE from different perspectives; Two meetings and two further teleconferences with the GBSO, as part of agreeing their partnership on the project. To further understand the industry view and the potential of this proposal to accommodate the diversity of TO and DNO system, two meetings were arranged with Energy Systems Catapult, two meetings with GE,one meeting with ESRI and one meeting with ARUP.		

	The value of our meetings/discussions is evidenced in the meaningful letters of support we received- as attached in our answer to question 30. At a more technical level; from their experience of working with other DNO systems, **CGI do not anticipate future integration of other DNO systems will be problematic** because, although the details of each system, its data model and interfacing methods have some differences, there is a significant degree of commonality as they are all materially similar assets in the same business domain under the same regulatory regime. The wider and more flexible range of interfacing methods that WISP will make available will facilitate more flexible integration methods in these cases, including to/from legacy/heritage systems that may never incorporate CIM support. This is further explained below. Regarding harmonising interfaces; there are two aspects to the INSPIRE strategy: - 1. **Existing DNO systems.** As stated in our answer to Q14, harmonising the interfaces of all existing core systems, based on CIM for example, would be excessively difficult and expensive. WISP will therefore adopt the simpler and innovative approach of mapping each set of source data into a common reference model, and reconciling the various sources, beforehand. Therefore INSPIRE will use an alternative approach to delivering the benefits of harmonising systems. INSPIRE will examine where integration can be done in line with the CIM standard use cases and, where these are considered appropriate, will then use the standard CIM message formats for implementing these. 2. **New applications.** INSPIRE will realise the benefit of harmonised data in the reference model exposed to new applications using industry and open standards. With the WISP it is also possible to simultaneously expose data in multiple versions of the same standards, differing standards and non-standards compliant formats – this would not be feasible or cost effective to implement in the legacy/heritage systems themselves. This new approach enables whole system data harmonisation without the need for the individual DNO/TO IT systems to be fully harmonised with each other. Network planning tools such as the TNEI IPSA tool are examples of applications that we intend to interface with using open standards.
Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	32
Question date	08 september 2016	Answer date	13 September 2016
Submission section question relates to	Section 5 – Knowledge dissemination		
Topic	Background IP		
Question	Please provide a breakdown of background IP and its ownership that will be used by the project.		
Notes on question			
Answer	Please see attached table. Note: “Creator” refers to third parties, yet to be selected, responsible for application development. INSPIRE will conform to the default IPR arrangements outlined by Ofgem in the NIC governance document. We confirm that: - • all other Network Licensees will have the automatic right to use Relevant Foreground IPR for use within their network royalty-free. • all other Network Licensees will have the automatic right to use the background IPR listed for use within their network royalty-free, limited to facilitating use of the Relevant Foreground IPR to reproduce the Project outcomes.		

Attachments	 Q32 IPR description.docx

IPR description	Status	Type	Created by	IPR assignment	Required for rollout.
[redacted]					
WSIP data models	Anticipated	Foreground	CGI	CGI	Yes
WSIP data dictionary	Anticipated	Foreground	CGI	CGI	Yes
WSIP metadata management capabilities	Anticipated	Foreground	CGI	CGI	Yes
WSIP engine algorithms, detailed design and software	Anticipated	Foreground	CGI	CGI	Yes
Data models (external to WSIP) supporting the use case applications.	Anticipated	Foreground	Creator	Creator	For specific application only
Data Services definitions and web services etc developed to support the Use Case applications.	Anticipated	Foreground	CGI	CGI	Yes
Web API definitions and web services etc developed to support the UC applications.	Anticipated	Foreground	CGI	CGI	Yes
Definition of other necessary external interfaces.	Anticipated	Foreground	CGI	CGI	Yes
Documentation, mock, stub and example code, example data, mock data.	Anticipated	Foreground	CGI	CGI	Yes
Use Case 1 & Use-case 4 Application Design	Anticipated	Foreground	Smarter Grid Solutions	Smarter Grid Solutions	For specific application only
Use Case 3 algorithm Design	Anticipated	Foreground	University of Strathclyde	University of Strathclyde	For specific application only

Use Case Application Software development	Anticipated	Foreground	Creator	Creator	For specific application only

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	33
Question date	08 september 2016	Answer date	13 September 2016
Submission section question relates to	Section 5 – Knowledge dissemination		
Topic	Foreground IP		
Question	Please provide a breakdown of the foreground IP that will be developed during the project and its ownership (including IP funded and developed by partners).		
Notes on question			
Answer	This information is contained in the table provided in response to Question 32.		
Attachments			

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	34
Question date	08 september 2016	Answer date	13 September 2016
Submission section question relates to	Section 5 – Knowledge dissemination		
Topic	IP required for rollout		
Question	Please indicate which items of background and foreground IP will be required to roll out the solution.		
Notes on question			
Answer	This information is contained in the table provided in response to Question 32.		
Attachments			

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	35
Question date	08 september 2016	Answer date	13 September 2016
Submission section question relates to	Section 4 – Benefits timlieness and partners		
Topic	Cost breakdown		
Question	In addition to your response to Question 9 of the Q&A, can you clarify which will be additional licences for the software components.3		
Notes on question			
Answer	The costs of software licences listed in the answer to Q9 is [redacted] Hardware is [redacted] and Services is [redacted] These costs are considered to be equivalent to the BAU costs as shown in our answer to Q38.		
Attachments			

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	36
Question date	08 september 2016	Answer date	13 September 2016
Submission section question relates to	Section 4 – Benefits timlieness and partners		
Topic	Existing tools		
Question	For each of the Use Cases please state which tools are already available on the market, what their shortcomings are and why it is not feasible to procure them as part of BAU. For example, for network planning there are commercially available network management tools that included load profile data management in real-time and for scenario planning that may meet the requirements of Use Case 4.		
Notes on question			
Answer	As explained in the table below, it is considered that INSPIRE will deliver new functionality, presently not provided by any tool available on the market. On this basis it is not possible to procure tools to provide the proposed purpose as part of BAU. INSPIRE will build tools based upon a whole system approach:		

Use-case	Existing Tools
Use-case 1: Co-ordination of Smart Grid Techniques	The Use-case 1 application will provide a facility to **configure the parameters for multiple smart solutions**. The need for smart solutions can be identified by the connection planning tools presently available in the market, for example Smarter Grid Solutions' GCAT product. Also, tools are available to control smart solutions, implementing actions in accordance with pre-defined thresholds and settings, for example Smarter Grid Solutions' ANM100 product. However, neither of these types of tools are able to determine the parameters for multiple smart grid techniques, as will be delivered by INSPIRE's use-case 1 application.
Use-case 2: Improved Network Visibility for 3rd Parties	We are not aware of any commercial tools. The existing process for transferring data to National Grid is mainly manual in the absence of commercial tools. INSPIRE's use-case 2 will automate the process for collating data and transferring it to National Grid. INSPIRE's use of the WISP integrated network model will dramatically accelerate this process and produce higher quality results hitherto not possible.
Use-case 3: Improved Network Performance via Data Analytics	Event processors are commercially available, but they are not tailored to the specific use-case and DNO requirements. However, they offer useful functionality and at this point it is anticipated that the use-case 3 applications will be built using the commercially available JBoss Drools Fusion event processor to maximise value. INSPIRE will deliver new analytics of Pole Mounted Auto Recloser (PMAR) analogue data, presently unavailable through a commercially available tool. Event processing developed under the SPEN DINO project and new advanced analytics will be supported by the dynamic whole system models provided by the WISP to provide a combination not available on the market today.
Use-case 4: Enhanced Network Planning	INSPIRE will interface with wider detailed data sources to facilitate applications beyond the network analysis supported by NMM tools such as Siemens' PSS®ODMS product. The automated demand connection assessment functionality to be delivered through INSPIRE's use-case 4 is not presently available in the market place. The WISP will draw data from existing market solutions (such as PowerOn, SAP, ESRI GIS etc), but will not replicate their functionality. Use-case 4 will undertake the provision of the enriched correlated dataset on a semi-automatic basis. Please see our response to question 43 and 19.

Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	37
Question date	08 september 2016	Answer date	13 September 2016
Submission section question relates to	Section 4 – Benefits timlieness and partners		
Topic	Existing tools		
Question	Please clarify where the following will be hosted (for example on a local SPD server or the Cloud): o The WISP engine and the data / meta-data o The new applications o The new data produced using the WISP and its associated applications		
Notes on question			
Answer	• **The WISP engine and the data / meta-data** Will be hosted on the on a local SPD server as we believe this is the most appropriate solution at this time. • **The new applications** Our proposal is based upon these also being hosted on local SPD infrastructure. If during the project we determine that the best business solution for a particular application is cloud hosted, then we will consider this option, provided it brings additional value to the project and meets our cyber security requirements. We have shown in our DINO project that it is possible to cloud host an application while meeting security requirements. • **The new data produced using the WISP and its associated applications** As per our answer directly above on the new applications.		

Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	38
Question date	08 September 2016	Answer date	13 September 2016
Submission section question relates to	Section 3 – Business case		
Topic	Cost benefit analysis		
Question	You have indicated that the approximate rollout cost per DNO is [redacted] Can you please indicate what this includes (hardware, software and services) and if there will be any ongoing licence fees?		
Notes on question			
Answer	[redacted]		

	[redacted]
Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	39
Question date	08 september 2016	Answer date	13 September 2016
Submission section question relates to	Section 4 – Benefits timlieness and partners		
Topic	Ongoing services		
Question	Where ongoing services are to be provided by CGI (such as upgrades, uploading and verification of third party apps, etc) please indicate the approximate one-off and service costs.		
Notes on question			
Answer	As there is no productionised system available at this stage, these figures cannot be derived at this stage. It should be noted that there will be no lock-in to a particular supplier for BAU provision and costs for these services can be negotiated with vendors during procurement. Some licensees may prefer to obtain these services from third parties or provide them in-house.		
Attachments			

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	40
Question date	08 september 2016	Answer date	13 September 2016
Submission section question relates to	Section 4 – Benefits timlieness and partners		
Topic	Ongoing services		
Question	Please indicate which services (hosting, upgrades, maintenance, etc) and licences will be exclusive to CGI, ie which components of this project will be tenderable in an open competition by SPD or another DNO at the outset and periodically.		
Notes on question			
Answer	Under the Inspire NIC only the WISP Platform specifically is being provided, by CGI. The applications are being provided by others or CGI demonstrating the open and interoperable nature of the solution. The IPR for the WISP Platform will belong to CGI. Licences will be made available to other licensees through the default IPR provision as stated in our answer to Q32. The licensees will be able to use their preferred systems integrator to provide a WISP including hosting, upgrades, maintenance etc. The same provisions will apply to the developers of applications as part of the project. All parties will be required to sign legally binding collaboration agreements to this effect.		
Attachments			

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	41
Question date	08 september 2016	Answer date	13 September 2016
Submission section question relates to	Section 4 – Benefits timlieness and partners		
Topic	Rollout		
Question	Please provide details of exactly what will be provided free of charge (as stated by SPD at the bi-lateral meeting on 7/9/2016) to third party developers and what will they have to procure from others to be able to develop applications.		
Notes on question			
Answer	We anticipate that the following will be provided free of charge: - - Dynamic data models for supporting the UC applications. - Data Services definitions and webservices developed to support the UC applications. - Web API definitions and webservices developed to support the UC applications. - Definition of standards and protocol usage (e.g. CIM profiles) and any extensions created. - Definitions of any other necessary external interfaces. - Documentation, mock, stub and example code, example data, mock data.		

	Generally CGI will provide the information necessary to develop the applications according to the methods above. The 3rd parties are not required to procure additional infrastructure or software above that which is required by their solution. If the 3rd party wishes or is required to host the application then it is an assumption that the technology will run inside a standard containerisation solution (such as “docker”).
Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	42
Question date	08 september 2016	Answer date	13 September 2016
Submission section question relates to	Section 3 – Business case		
Topic	Cost benefit analysis		
Question	Please set out in detail (as discussed at the bilateral meeting on 7/9/2016) the scope of the project for each of the Use Cases, describing: o the systems to be integrated providing the system names, outline of their functions and the data to be integrated from them o the part of the network for which this is the case indicating the number of substations and the circuits / transformer and the voltage levels o the applications that will be developed for the Use Case		
Notes on question			
Answer	As discussed at the bilateral meeting, we have set this information out in an A3 format table, attached.		
Attachments	Question 42 Table_A3_Landscape		

Use-case	Application functionality	Source System (functions) and Data Requirement	Trial Area (Number of substations / circuits / transformers / voltage)	Cumulative financial benefits to 2050 at SPEN scale (Figure 3-4)	Existing Process	INSPIRE Process
Use-case 1 - Co-ordination of Smart Grid Techniques	Use-case 1 will bring together static data from select, mature smart grid solutions with network models and captured load and generation time-series data to enable coordinated engineering configuration for enhanced performance while accessing live system operational data to identify in-flight enhancements to the configuration of smart grid techniques.	• Power Factory power flow model. • GE PowerOn (Network Management System) real time thermal ratings module static configuration parameters and time series operational data stream (meteorological data, ratings calculations) • SGS ANM system static configuration parameters (e.g. control margins and thresholds) and in-flight system operational data (DG control instructions and response, constraint location measurements) • Nortech LV ANM system static configuration parameters and in-flight operation data (control instructions, calculated headroom). The data sets above will cover all relevant DER types in the trial area including different types of DG, DSR and Storage if this is developed in the trial area by third parties	Dumfries & Galloway (D&G) network area: Min load = 50MW Firm Capacity = 705MVA for accommodating DG across distribution network (825MVA in future). 33kV contracted DG = 663MW 11kV Contracted DG = 100MW	£14million	Implement single smart grid technique in any single circuit or substation. Analysis of the D&G network indicates that: circa 130MW DG can be accommodated with intertrip flexible connection alone. Additionally implementing or replacing Intertrip with ANM enables an additional 33MW DG connection capacity in 33kV network.	Coordinate the operation of multiple smart grid techniques and configure the techniques based on static configuration data and in-flight operational data using the INSPIRE use-case 1 Smart Configuration Application. Analysis of the D&G network indicates that an additional 7MW capacity will be gained through coordination of ANM and extension into 11kV networks, 20MW capacity will be enabled through coordination with DLR/RTTR and another 20MW capacity enabled through integration and coordinated management of energy storage. TOTAL additional capacity due to INSPIRE use-case 1 = 47MW
Use-case 2 - Improved Network Visibility for 3rd Parties	The Proposed use-case will consist of the following elements; 1.Support the GBSO strategic planning by providing NG with a greater visibility of the Distribution Network, specifically; a. breakdown of net demand at each GSP (Consumer demand, generation, types of DG, ANM schemes, DNO initiated DG/DSR actions) b. information on generation constraint management systems c. The network configurations between GSPs (i.e. meshed DNO networks which connect between two GSPs) 2. Enable the DNO/DSO to safely plan their active network management, by providing the DNO/DSO with visibility of the Transmission System and TSO instruction to customers on the Distribution Network, specifically; a. Transmission Switch positions at GSPs b. Upstream and downstream fault level in-feed profiles at GSPs c. TSO contracts/planned actions for provision of reserve by customers on the Distribution Network	Within the DNO: • ESRI (Geographical Information System) Circuit data e.g. length, Impedance • SAP (Enterprise Asset Management System) asset data (e.g. thermal ratings, impedance) • Excel • DigSILENT (Power system modelling) Network model • PI (Data Historian): current, voltage, real and reactive power flows Within the GBSO: • Email abstracting • Excel • Power Factory (power system modelling)	Dumfries & Galloway (D&G) network area: (see use-case 1)	£4.5million	Manual preparation and transfer of data annually.	1) Enable the GBSO to accommodate data on a more frequent basis (say quarterly or monthly); 2) incorporate files that are already CIM compatible Benefits arise from clearer knowledge of the networks and reduction is reserve capacity and Balancing Mechanism actions as well as reduced changes to capital plans as there is more clarity on all generation and the impact of embedded generation.
Use-case 3 - Improved Network Performance via Data Analytics	Use-case 3 will use data analytics to predict faults on the 11kV overhead line network. It will deploy algorithms developed by University of Strathclyde which analyse analogue log files from NOJA Pole Mounted Auto Reclosers (PMAR). The algorithms are currently coded as rules and run within a Java Eclipse environment as a standalone function. The functions of the proposed application can be summarised as follows: 1. Fault diagnosis of known common faults associated with PMAR devices (detecting asset deterioration of the device itself). 2. Diagnosis of semi-permanent faults (detect patterns that represent the behaviour associated with semi-permanent faults) 3. Prediction for future PMAR operations (the predictive function uses data mining and clustering to identify data clusters in the NOJA PMAR log files that indicate a likely trip within a certain time period)	• Nortech iHost (Field data adapter/database) • Analogue data from NOJA pole mounted auto reclosers • GE PowerOn (Network Management System) Network topology and circuit configuration • ESRI (Geographical Information System) Circuit data e.g. length, impedance • PS Alerts (Fault Notification System) Network fault information	For the trial, 50 overhead lines with NOJA PMARs will be selected from the 142 worst performing 11kV overhead line circuits in SPD. Of these 50 lines, 17 will be in Dumfries and Galloway. Therefore 34% of the trial (17/50) will be undertaken in the Dumfries and Galloway area.	£24million	Overhead line faults are dealt with using reactive emergency response processes. The target cost to repair is [redacted] per fault.	From examining fault causes on 11kV lines we estimate that up to 45% of faults can be predicted. These faults will be addressed using planned maintenance processes which we estimate to cost 50% of the cost of the reactive process.
Use-case 4 - Enhanced Network Planning	The use-case application will be developed for demand connections. By accessing DER network data from multiple sources and interfacing with planning tools, it will: 1. Create a regularly updated network baseline 2. Calculate demand connection headroom 3. Calculate latent demand for planning, operations and SO sharing 4. Develop a Portal for customer connection assessment interaction and gathering demand connection data (Stretch Goal)	• PI (Data Historian): current, voltage, real and reactive power flows • MPAN (meter readings database) for demand half-hourly data • DG metered data for half-hourly profiles • DG Tracker database for DG connections data • ESRI (Geographical Information System) Circuit data e.g. length, impedance • SAP: asset data (e.g. thermal ratings, impedances) • Small scale DG penetration data Future: • Smart meter data	The trial of use-case 4 is expected to cover two Grid Supply points within the D&G area (approximately 50 of the 176 11kV circuits).	£42million	Traditional design techniques are no longer sufficient and therefore designs may be less than optimal.	Improved network design using multiple sources of information and analysis based on planning and operational data synthesis.

The breakeven point based on the assumed rate of GB deployment is 4 years.

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	43
Question date	08 september 2016	Answer date	13 September 2016
Submission section question relates to	Section 3 – Business case		
Topic	Cost benefit analysis		
Question	Specific to Use Case 4 explain how the additional benefit (compared to BAU) will be derived from the applications to be developed.		
Notes on question			
Answer	As increasing amounts of low carbon technologies are deployed the network, **the planning techniques traditionally used are no longer sufficient**. To achieve efficient designs, more complex planning techniques must be employed taking into account a greater range of information and options. At the same time the number of additional sources of relevant data are increasing and **the volume of data is increasing exponentially**. The information needed to more accurately plan the network is in disparate systems, not correlated and, in some cases not in a user friendly form. It is impracticable in many cases for designers to assimilate an in-depth accurate view of the network and therefore to fully assess the varying scenarios that could prevail. The result is that safety factors to address risk must be built into planned capacity that could be reduced if the risks were more fully understood. These issues are becoming particularly apparent in relation to the 11kV network at present. Use-case 4 will synthesise data from disparate systems to present a		

coherent correlated view of the network. It will provide a regularly updated network status baseline populated with a comprehensive whole-system dataset. This holistic baseline will include latent demand, and proposed network changes to produce an "authorised" baseline against which actual network reconfiguration can be followed and future options considered.

Additionally, it is intended to semi-automate the provision of the enhanced view of the network to the existing planning tool to further support enhanced design capability.

Importantly the methodology to be delivered by Use–case 4 facilitates a standardised planning approach to ensure consistency and application of an accepted level of risk.

These learning outcomes from INSPIRE have been the focus of particular support from other DNOs during discussions with Northern Powergrid, and SSEPD (NTVV project).

More detailed examples of how Use-case 4 application will improve design support and therefore result in more accurate planning are shown below.

Current Approach	**Use-case 4 Benefit**
GIS information on individual cable section capacity isn't clearly correlated to the location of the cable section. Assumptions are therefore made about the capacity of the overall circuit.	Inclusion of ordered connectivity allows variations in circuit ratings along the length of the circuit to be exploited
The derating effects of cable **ducts** are often assessed individually or pessimistic assumption adopted	Consistent approach can be applied on the basis of accurate duct data imported from the GIS system
Customer maximum import capacity (MIC) data can be applied inconsistently as it is included based on experience and local knowledge	Comprehensive provision of customer's MIC data
Transformer voltage set points or tap positions are based on expectations and less commonly specific and updated information	Transformer voltage control is more accurately represented as site information is included in planning models.
Maximum and minimum **loading levels** are evaluated by looking at half hourly substation data. This process is inherently subjective. Furthermore the data from legacy systems in both primary and secondary substations hs been shown to be subject to inaccuracies.	A statistical approach can be applied to take a probabilistic approach to exclude outliers and obvious data errors due to transducer issues, to deliver consistent pre-assessed max and min loading information for all circuits.

	The effect of **embedded generator** export is unknown or at best is modelled on the basis of simultaneous Maximum Export Capacity (MEC)	By correlating data from multiple sources and applying state estimation techniques a much better model of the effect of generation can be developed.
	Generator's are assumed to operate at fixed **pessimistic power factors**	Specific generator connection agreement terms, such as power factor and operation under outage conditions, can be reflected in planning system models.
	There aren't measurements for load at intermediate points on the network and it is therefore estimated.	The inclusion of customer half-hourly metering data from industrial/commercial customers can be used to improve accuracy as can state estimation techniques.

On our Flexible Networks project, the attached report from University of Strathclyde shows that following detailed analysis of the network in St Andrews it was possible to achieve a capacity headroom increase of up to 22% by relatively straightforward reconfiguration of the 11kV network. The analysis approach was highly labour intensive and not one that could be repeated regularly in business as usual. The results however give us confidence that the application to be developed under Use-case 4 can comfortably deliver the 5% benefit from improvenment in accuracy that has been used in our CBA.

Attachments	 Q43 Evaluation of Headroom and Load T

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	44
Question date	08 september 2016	Answer date	15 September 2016
Submission section question relates to	Section 4 – Benefits, timlieness and partners		
Topic	Partner funding		
Question	Please confirm the value of funding that will be spent on each project partner (incl labour and equipment costs).		
Notes on question			
Answer	As stated in the full submission we have carried out a robust bottom-up costing exercise to arrive at the project budget. Through extensive industry engagement we have selected partners with the specialist knowledge and experience to bring added value to the project. They will help develop an open and interoperable approach for licensees, thus driving value for the electricity customer. The costs stated below represent our best estimate of costs based on the work undertaken to date. No contracts have yet been placed. At the commencement of the project we will work with Procurement colleagues and will endeavour to further improve the value delivered to customers. In addition, a significant amount of work, not included below, to develop new applications will be awarded through a competitive process.		

	
Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	45
Question date	08 September 2016	Answer date	15 September 2016
Submission section question relates to	Section 4 – Benefits, timlieness and partners		
Topic	Partner funding		
Question	Please provide an estimation of potential benefits to project partners in the event of rollout on the GB scale as presented in the benefits estimation in appendix A.		
Notes on question			
Answer	It should be noted that the INSPIRE project will reduce the cost of the solution trialled. If a licensee were to implement the solution currently, we estimate the cost would be in excess of £6m. After the project we estimate that rollout costs will be [redacted] representing a significant cost saving of up to [redacted] for GB customers. It is one of the principles of INSPIRE that **there won't be any lock-in to a partner or other supplier following the project**, therefore it is not possible to predict the revenue that any project partner might generate during rollout. Further, our partners target profit margin is not available to us to estimate their ultimate financial benefit. **CGI** [redacted] The WISP will deliver an "Ofgem innovation project sourced" alternative to point-to-point integration, or the substantively expensive service orientated architecture and CIM		

	compliant full width enterprise service bus implementation. CGI considers that the INSPIRE WISP comprising both integration and master data management will benefit customers, the DNOs and its own position in the market sector. The majority of work undertaken on any rollout projects would be undertaken by UK based staff thus furthering the national knowledge base and capability in this field. Once proven with the UK DNO's, CGI also has the organisational reach to seek to replicate success in other countries and promote export possibilities. **University of Strathclyde** The University believe their academic interests will be furthered by full validation of the data science approaches and methods developed by the University team. This allows them to be confidently applied to a wider set of operational data such as trip coil analysis, digital fault recorder analysis. The WISP will also provide a data management platform which makes such research and development more effective as there will be an obvious solution to data access and management The University are unlikely to be directly involved in rollout. Rollout will show industry impact from their research. This is an essential part of a University's mission and is fully assessed as part of the Research Excellence Framework assessment in 2020. Such a case study of rollout would demonstrate the value of University research to UK industry. **Smarter Grid Solutions (SGS)** As an SME with a leading position in the UK Active Network Management (ANM) market, SGS believe that engagement with innovation projects help them to maintain this position. Motivation for participating includes stimulating and informing their internal research, innovation and development activities, and also a desire to contribute to the advances in grid technology. It is currently envisaged that 100% of work undertaken on any rollout projects would be undertaken by UK based staff, thus furthering the national knowledge base and capability in this field. SGS are active in the North American market and believe that the learning generated through innovation projects assists them in developing export opportunities. **Nortech** As an SME supplying specialist monitoring technology products and services to utilities, Nortech believe that engagement with innovation projects help them to be recognised by the industry as a leading player. **GBSO** The benefits to GBSO arising from rollout include better knowledge of the networks resulting in reduction is reserve capacity and Balancing Mechanism actions, as well as more accurate planning for outages (and therefore reduced constraint payments) as there is more clarity on all generation and the impact of embedded generation.
Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	46
Question date	08 September 2016	Answer date	15 September 2016
Submission section question relates to	Section 4 – Benefits, timlieness and partners		
Topic	Partner funding		
Question	Please provide a justification of the level of contribution to the project from each project partner. The response should consider partner cost to the project and the potential to benefit post project.		
Notes on question			
Answer	Each supplier partner; • Brings extensive specialist experience to the project • Will undertake the majority of the project and any future rollout work using UK based staff, thus increasing national knowledge and capability • Considers that involvement in such projects help them to develop export opportunities A justification is included below for the inclusion of each project partner in the project. **CGI** **Cost:** [redacted] **Contribution** [redacted] CGI have been selected as the main technical partner for the INSPIRE project for the reasons explained in the proforma and summarised as follows. • Through previous experience on innovation projects including Low		

Carbon London, FALCON, and FUN_LV, CGI have demonstrated an evolutionary development path leading to the proposed WISP.

- CGI have experience of helping DNOs to deploy and integrate major new systems, giving them a grounding in the data structures of these existing systems.
- CGI were selected through a competitive tender process for our DINO NIA project and have successfully demonstrated some of the techniques that will be applied more widely under INSPIRE.

Through the knowledge and experience evidenced above CGI bring significant added value to the project.

CGI have significantly contributed to the proposal preparation at their own cost, equivalent to [redacted] and will make a further contribution in kind of [redacted] during project delivery, a total of [redacted] which is a significant amount relative to their cost to the project.

As explained in our answer to Question 45, there is no obligation on any other licensee to use CGI in the rollout of the INSPIRE method.

Therefore we believe that the appointment of CGI represents good value to the project and the electricity customer.

University of Strathclyde (UoS)
Cost: [redacted]
Contribution: [redacted]

The UoS have been selected as academic partner for the project and will be engaged with use-case 3 and in the wider evaluation of trial results, interpretation of outcomes and and validation of trial methodologies.

- The UoS has developed the prototype PMAR diagnostic and prognostic algorithms that are the basis for Use-case 3.
- Knowledge dissemination is a key element of the INSPIRE project and the UoS is able to support this fully through its leadership role in the EPSRC HubNet programme.

The UoS is making a major contribution in kind to the project through the provision of a PhD student at no cost to the project through the EPSRC Centre for Doctoral Training in Future Power Networks and Smart Grids.

The UoS is unlikely to directly participate in, or directly benefit from future rollout.

Therefore we believe that the appointment of UoS represents good value to the project and the electricity customer.

Smarter Grid Solutions (SGS)
Cost: [redacted]
Contribution: [redacted]

SGS have been selected as an additional technology and systems partner for design and requirements specification of use-case applications based on smart grid techniques.

- They are leaders in this area and have contributed to industry

thinking through national working groups.

- SGS bring previous relevant experience from innovation projects including WPD Lincolnshire Low Carbon Hub, UKPN Low Carbon London, UKPN Flexible Plug and Play, SPEN ARC, and SSEPD NINES.

As explained in our answer to Question 45, there is no obligation on any other licensee to use SGS in the rollout of the INSPIRE method.

With a contribution of [redacted], we believe that the appointment of SGS represents good value to the project and the electricity customer.

Nortech
Cost: [redacted]
Contribution: [redacted]

Nortech have been selected as an additional technology and systems partner for a system which will collect data required for use-case 3.

- They are specialists in this area and have helped with monitoring and data retrieval for other DNOs on numerous innovation projects.
- Nortech have already proven that their RTU can interface with the NOJA PMAR devices on our network, mitigating a potential risk to implementation of this use-case.

A substantial element of the Nortech cost is equipment - [redacted] Their contribution in kind represents a significant element of the remaining [redacted] labour costs.

As explained in our answer to Question 45, there is no obligation on any other licensee to use Nortech in the rollout of the INSPIRE method.

Therefore we believe that the appointment of Nortech represents good value to the project and the electricity customer.

National Grid (GBSO)
Cost: [redacted]
Contribution: [redacted]

GBSO are partnering us in this project to deliver use-case 2 – Improved Network Visibility for 3rd Parties – because, like SPEN, they believe that it has the potential to deliver significant benefits for the overall GB network.

- It is essential that National Grid participate in this use-case to ensure that GBSO requirements are satisfied.
- GBSO will help to detail the design of the key deliverables and will verify the application delivered during the trial phase.
- Knowledge dissemination is key to the rollout of the application and the consequential benefit realisation. GBSO will contribute to the knowledge dissemination both within National Grid and externally with DNOs.

GBSO will absorb their costs associated with modifying their internal data management processes which is an estimated contribution of [redacted].

	Any financial benefits that accrue to the GBSO as a result of rollout will ultimately be to the benefit of the electricity customer.
Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	47
Question date	13 september 2016	Answer date	15 September 2016
Submission section question relates to	Appendix B		
Topic	Carbon benefits		
Question	We understand that your carbon benefits are based on the FES Gone Green scenario. Please provide some analysis to show the sensitivity of the estimated carbon benefits under different Future Energy Scenarios.		
Notes on question			
Answer	INSPIRE's carbon benefits are evaluated considering future energy supplied by the additional DG that will be accomodated through INSPIRE's applications. In the full submission the additional capacity and energy supplied by DG accomodated by INSPIRE applications were calculated based upon the Gone Green Future Energy Scenario. Sensitivity of the carbon benefits has been assessed by using data for the Slow Progression and Consumer Power scenarios. The No Progression scenario has not been considered because it is not deemed to be credible. The analysis uses the "Installed Capacity" and "Generation Output per Technology" data tables for each of the FES.		

	FES Scenario		
	Slow Progression	Gone Green	Consumer Power
Cumulative carbon benefits by 2050 (tCO2e)	972,797	1,362,829	2,201,308

Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	48
Question date	13 September 2016	Answer date	15 September 2016
Submission section question relates to	Appendix B		
Topic	Carbon benefits		
Question	We understand that your carbon benefits have been estimated on the basis of additional generation capacity released by the solution. Please provide an estimate of wider carbon/environmental benefits of the solution from connection of LCTs and avoided reinforcement.		
Notes on question			
Answer	For simplicity, carbon benefits presented in the INSPIRE full submission have been estimated only on the basis of additional generation capacity released by the solution. We estimate that the wider carbon benefits of the solution from connection of LCTs and avoided reinforcement are equivalent to an additional cumulative carbon benefit at GB rollout scale by 2050 of 868,159 tCO2e. The estimate assumes that capacity provided by INSPIRE allows LCTs to connect 6 months earlier than they otherwise would through conventional reinforcement, and also accounts for avoided 11kV circuit reinforcement.		
Attachments			

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	49
Question date	13 September 2016	Answer date	15 September 2016
Submission section question relates to	Appendix B		
Topic	Benefits		
Question	Please provide an indication of the sensitivity of the benefits to roll-out assumptions.		
Notes on question			
Answer	We believe the benefits presented in the full submission are evaluated on the basis of a conservative uptake rate, therefore we have carried out a sensitivity analysis using two additional less cautious assumptions on the rate at which DNO licence areas adopt the INSPIRE WISP. The table below shows the cumulative benefits to 2050 at GB rollout scale calculated using our base assumption (Slow Uptake) as presented in the full submission, and the alternative assumptions. All tabulated benefits are evaluated based upon the FES Gone Green Scenario. (see next page for table)		
Attachments			

Answer (continued)

Summary of Financial benefits, Capacity Released and Carbon Benefits for alternative uptake rates

Uptake Rate	WISP uptake rate	Applications uptake rate	2050 GB NPV Benefits	2050 Capacity Released (MVA)	2050 Carbon Benefit (tCO2e)
Slow Uptake	Additional licence area installs a WISP **every other year** (full submission uptake rate)	One per WISP per year	**£93m**	**1,088**	**1,362,829**
Intermediate Uptake	Additional licence area installs a WISP **every year**	One per WISP per year	**£170m**	**1,504**	**2,310,604**
Fast Uptake	**All** licence areas install a WISP in roll out year (**2021**)	One per WISP per year	**£386m**	**1,920**	**4,177,253**

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	50
Question date	20 September 2016	Answer date	22 September 2016
Submission section question relates to	Appendix B		
Topic	Capacity and Carbon Benefits		
Question	How much of the capacity and carbon savings are truly NET ADDITIONAL to GB?		
Notes on question			
Answer	All of the capacity and carbon savings are truly NET ADDITIONAL to GB. Capacity realeased and carbon benefits have been conservatively estimated based upon the **incremental** gain provided by INSPIRE. The applied methodology evaluates the **additional** capacity released and **additional** carbon benefits arising from INSPIRE. INSPIRE applications will perform a range of functions and some will affect how connections are accommodated on the network. Consequently, only 10% of INSPIRE applications are assumed to release capacity and provide associated carbon benefits. The benefit of these applications is taken to be that associated with the better use of the system and smart solutions, **not** the whole capacity realeased or carbon benefit of the smart solutions. **Capacity Released** Capacity release corresponds to the accomodation of additional low carbon generation on the distribution system. GB rollout of the INSPIRE solution is estimated to increase capacity by an **additional 1% of the new capacity required for new distributed generation connections by 2050**. 1% is derived based on the INSPIRE facilitated increase in smart solution capacity as explained for use-case 1 in section B.1.5 of the full submission. It is		

	assumed that without INSPIRE connection of this low carbon generation will be delayed indefinitely, on the basis that the alternative conventional reinforcement leads to extended delays or renders the connections uneconomic. **Carbon Benefit** The carbon benefits stated in the INSPIRE full submission correspond to the accomodation of additional low carbon generation on the distribution system. The methodology considered network losses and was based on the incremental benefit provided by INSPIRE as explained in section B.3. The response to Question 48 evaluated two further sources of carbon benefit; i) the asset carbon impacts associated with the network reinforcement avoided by increased utilisation of the existing network, evaluated considering the incremental capacity created by INSPIRE, and ii) accomodation of additional low carbon demands such as heat pumps and electric vehicles 6 months earlier than otherwise, also evaluated based upon the incremental capacity created by INSPIRE.
Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	51
Question date	27 September 2016	Answer date	29 September 2016
Submission section question relates to	N/A		
Topic	Environmental and consumer benefits		
Question	How will Inspire provide benefits during ED1?		
Notes on question	N/A		
Answer	Given the completion date of the INSPIRE project and the time required for subsequent BAU rollout, we do not anticipate that significant benefits will be provided during ED1. However we consider that rollout of the INSPIRE method will begin immediately on completion of the project in the SPEN licence areas and some benefits could begin to be provided by the end of ED1. We will build on the project trials undertaken in the Dumfries and Galloway trial area and in particular by Use-case 1 – Coordination of smart grid techniques. This is an area where there is a high demand for the connection of new distributed generation (DG). The severe constraints on new generation connections in the area have been apparent for around a decade. By the end of ED1, SPEN plan to implement smart solutions to facilitate the maximum amount of DG to connect on an actively managed basis.		

	The Use-case 1 application is expected to release additional capacity for DG connections through the co-ordination of these smart solutions. The primary benefits result from lower-cost, faster customer connections. It is also anticipated that the INSPIRE Use-case 1 application will facilitate additional capacity for DG in North Wales at the end of ED1.
Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	52
Question date	27 September 2016	Answer date	29 September 2016
Submission section question relates to	N/A		
Topic	Environmental and consumer benefits		
Question	The bid is based on the premise of a 'whole-systems' approach to data. 'Whole systems' is defined as encompassing 'power system and business system and future new systems (e.g. customer systems or aggregator systems)'. Please note that Ofgem and CEER have been using the term 'whole systems approaches' to describe approaches which best meet customer needs across all voltage levels. To what extent is the proposal intended to support efficient whole system outcomes in this context?		
Notes on question	N/A		
Answer	Existing data management practices do not facilitate the participation of wider stakeholders in the whole system approach that is anticipated to be required for the efficient functioning of the future electrical network. INSPIRE will support a genuinely 'whole systems approach', as identified in the FPSA project, to best meet customer needs by facilitating applications that will: • Enable data access/exchange to be set up with third parties in a systematic and standardised way, avoiding the need for bespoke solutions. This will provide for adaptability and assist quality control, and minimise complexity as data systems become more interconnected both in-house and with external parties. • Provide access to data that is needed to achieve visibility of more active network operation at all voltage levels and in time frames		

	ranging from real time to historic trends. This will inform new operational and forecasting approaches which need to satisfy evolving requirements and will include new participants in system services and balancing. It will also, where agreed, enable interaction with smart systems owned by third parties. • Co-ordinate the roles of all power system stakeholders to allow the participation of individual customers, aggregators and community energy. This wider view of the networks together with their active customers is likely to be beneficial where DSO roles are established. For example information regarding DSR, storage, and flexible generation will be more readily available in order that they can be accessed to provide effective services. • Facilitate cross sector optimisation by permitting algorithms that can draw data from multiple sources outside of the immediate electrical network (such as smart EV charging systems and distributed storage devices, and in the future cross-vector interactions such as heat systems or hybrid heat pumps). • Provide a platform that has the necessary adaptability to accommodate modifications as whole system technologies and consumer requirements develop, and is scalable to the pace of change, including the potential for tipping point behaviours.
Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	53
Question date	27 September 2016	Answer date	29 September 2016
Submission section question relates to	N/A		
Topic	Relevance and timing		
Question	Ofgem recently presented to the ENA's TDI steering group on the need for greater co-ordination between DNOs, the SO and TOs on network planning and efficient use of system resources in operational timeframes, in order to deliver the best whole system outcomes for consumers. The ENA took away an action to scope out work packages in this area. As well as engaging with individual stakeholders such as the SO and customers, how is the project intending to engage with groups such as the ENA TDI SG who are likely to be generating thinking which can inform the objectives (via current and future use cases) and development of data platforms such as this?		
Notes on question	N/A		
Answer	SP Energy Networks are represented on the ENA TDI Steering group by: • Gerard Boyd – Distribution Commercial and Innovation Manager (nominally representing SP Distribution and SP Manweb) • Deborah MacPherson – Lead Analyst Transmission Policy (nominally representing SP Transmission) Gerard will work closely with the INSPIRE project team to ensure that the priorities and considerations of the ENA TDI group are fully captured by the INSPIRE project. The INSPIRE project team will present at an appropriate TDI Steering group session to inform the Steering group and provide an opportunity for feedback and direction. We have reviewed the 'Transmission and Distribution Interface Steering Group Report – May 2016'. The INSPIRE proposal for use-case 2 is complimentary to the ENA's TDI steering group since it will develop the		

	processes for transferring data, whilst the latter is examining the needs of the transmission interface to establish whole system operation , including identification of what data is required to be transferred. Learning from the steering group will be used to inform the functionality of the use-case 2 application to ensure that the approach is capable of meeting the identified needs.
Attachments	

Electricity Network Innovation Competition Full Submission

Supplementary Answer Form

Project: INSPIRE

Tick if this answer has been provided verbally: ☐

Project code	SPDEN02	Question Number	54
Question date	27 September 2016	Answer date	29 September 2016
Submission section question relates to	N/A		
Topic	Generates new knowledge		
Question	The use cases describe how INSPIRE can achieve co-ordination of smart grid solutions, as well as enhanced network visibility/information exchange. To what extent is INSPIRE intending to integrate data on the availability/location etc of flexibility providers at distribution level (ie flexible resources who may be offering services to the DNO or the SO), to inform these smart grid solutions?		
Notes on question	N/A		
Answer	We confirm that we do consider flexible resources, such as storage and demand side response, provided by third parties on the distribution network to be smart solutions in the context of Use-case 1. Therefore part of the functionality of Use-case 1 will be to facilitate SPEN planners and engineers to configure smart grid techniques to optimise the network capacity and harness the capability of energy storage and DSR to utilise network capacity more fully. The present approach to sharing smart technology information is often inconsistent and reliant upon local knowledge of DNO engineers to spot opportunities for smart solutions. It is unsustainable in the future when complexity is expected to increase as the varience and number of smart participants grows. INSPIRE's approach will effectively provide consistent, complete and far-reaching information regarding flexible providers and lead to greater intelligence and efficiencies when designing future networks incorporating smart solutions.		

	In addition to the visibility of flexible resources being made available to internal planners, the visibility will be extended to the SO as part of the implementation of Use-case 2. Further functionality to fully harness all sources of flexibility for purposes and value streams beyond distribution network capacity utilisation could also be enabled by the WISP in future. We envisage that visibility of the network will also be extended to other parties in the future. INSPIRE seeks to develop a common platform for developers, network operators and aggregators to ensure that flexibility providers can act on a services market in a seamless and consistent manner. To maximise the benefits of future Distributed Energy Resources (DERs), visibility of their capabilities will be required by both the SO and any future DSO.
Attachments	