



# CHARGE



## Network Innovation Competition

Project Progress Report  
January 2020

Document Version: 2.0

Date: March 2020

Approved by:

*OMURPHY*





## DOCUMENT ISSUE CONTROL

### Version History

Version	Date	Comment	Author
1.0	18/12/2019	First draft	Smarter Grid Solutions, PTV, EA Technology, SP Energy Networks
2.0	24/03/2020	Updated based on feedback from Ofgem and transposed to new project template	EA Technology

### Final Approval

Version	Date	Role	Name	Signature



## CONTENTS

DOCUMENT ISSUE CONTROL .....	2
VERSION HISTORY .....	2
FINAL APPROVAL .....	2
CONTENTS .....	3
TABLES .....	4
<b>1. EXECUTIVE SUMMARY .....</b>	<b>5</b>
1.1. SUMMARY .....	5
1.2. PROJECT BACKGROUND .....	5
1.3. PROJECT PROGRESS HIGHLIGHTS .....	5
1.4. BUSINESS CASE .....	7
1.5. LEARNING OUTCOMES .....	7
1.6. KEY RISKS .....	7
<b>2. PROJECT MANAGER'S REPORT .....</b>	<b>8</b>
2.1. PROJECT MANAGEMENT .....	8
2.2. METHOD 1 – STRATEGIC TRANSPORT AND NETWORK PLANNING .....	8
2.2.1. <i>Transport Model Development</i> .....	9
2.2.2. <i>EV Futures Scenario Development</i> .....	9
2.3. METHOD 2 – TACTICAL SOLUTIONS TO SUPPORT EV CONNECTIONS .....	10
2.3.1. <i>Assessments of Candidate networks in SPM and other licence areas</i> .....	10
2.3.2. <i>Cost Benefit Analysis</i> .....	11
2.3.3. <i>Trial Site Identification</i> .....	11
2.3.4. <i>Phase 2: Limited Trial Design Early Progress</i> .....	11
2.4. METHOD 3 – THE DEVELOPMENT OF THE 'CONNECTMORE' SOFTWARE TOOL .....	11
2.5. KNOWLEDGE DISSEMINATION .....	12
<b>3. BUSINESS CASE UPDATE .....</b>	<b>13</b>
<b>4. PROGRESS AGAINST PLAN .....</b>	<b>14</b>
<b>5. PROGRESS AGAINST BUDGET .....</b>	<b>15</b>
<b>6. BANK ACCOUNT .....</b>	<b>17</b>
<b>7. SDRC .....</b>	<b>18</b>
<b>8. LEARNING OUTCOMES .....</b>	<b>19</b>
<b>9. INTELLECTUAL PROPERTY RIGHTS (IPR) .....</b>	<b>21</b>
<b>10. RISK MANAGEMENT .....</b>	<b>21</b>
<b>11. DATA ACCESS DETAILS .....</b>	<b>30</b>
<b>12. ACCURACY ASSURANCE STATEMENT .....</b>	<b>30</b>



TABLES

Table 1: Project Progress against plan ..... 14

Table 2: Project Progress against budget..... 15

Table 3 SDRC progress summary ..... 18

Table 4 Stakeholder engagement workshops hosted by the Charge project..... 19

Table 5 Learning dissemination undertaken by the Charge project team..... 20

Table 6: Technical Project Risk..... 22

Table 7 Commercial Project Risk..... 26

Table 8 Financial Project Risk..... 29





## 1. Executive Summary

### 1.1. Summary

The Charge project is up and running and starting to generate deliverables in line with the original project plan. As we approach the end of December 2019 each of the project's 'Methods' will have or will be very close to delivering tangible outputs.

- We will be close to taking delivery of a full transport model for the SP Manweb licence area – a first for UK DNOs.
- A high-level assessment of the perceived benefits of smart charging solutions will have been completed and the development of trial sites for 2020 will be underway. The user requirements of the ConnectMore connection tool for EV infrastructure will have been defined.

The next 12 months will continue in the same vein and the major deliverables and learning generated by each of the Methods will continue at pace.

### 1.2. Project Background

The Charge project is funded through Ofgem's Network Innovation Competition. The project commenced in January 2019 and will run until March 2023. The aim of the project is to identify appropriate locations for Electric Vehicle (EV) chargepoints and accelerate deployment at the lowest possible cost to GB electricity customers. It will maximise the use of existing assets by identifying where capacity exists, and by developing innovative approaches to connecting and managing the additional load introduced onto the network for EV charging. It will also combine learning from other projects and expertise from the world of transport planning. This learning will be coupled with a targeted selection of innovative EV chargepoint connection trials to better understand the benefits of flexible connections.

This report details the progress of the Charge project, focusing on the first 12-month period of the project from January 2019 until December 2019. It also sets out work due to be carried out between January 2020 and June 2020.

### 1.3. Project Progress Highlights

Since the project's initiation it has broadly progressed in line with the plan and there are no major concerns that project delivery will not continue as expected. A robust project governance board has been established and a project delivery team, that meets regularly, has been created. The first project SDRC (SDRC 3) has been completed to plan.

This report will present a view from the Project Manager on behalf of the project delivery team, along with the issues addressed and the key risks encountered as well as those that could potentially arise.

The overall project is divided into three distinct workstreams or 'Methods' and the Project Manager's report describes project progress in terms of these Methods



### **Method 1 – Strategic Transport and Network Planning**

PTV, the project partner that is delivering Method 1 of the Project, is developing a suite of transport models for the project to help identify the potential electricity demand from EVs in the future. PTV have used their leading strategic transport modelling software Visum to build and calibrate a base year model. This base year model represents current travel patterns for the entire SPM licence area, with data included to represent the road and public transport networks, population and demographic data, land-use data, and observed travel patterns derived from sources such as mobile phone data. Calibration and validation of this model using observed transport data is set to be completed in January 2020.

PTV has also developed a set of future scenarios relating to EV uptake and anticipated charging behaviour. The scenarios have been created following consultation and input from several workshops and industry events. These workshops drew on internal project and external stakeholder expertise to identify the critical factors that are likely to affect EV uptake and charging demand.

The scenarios will be further developed early next year to fully define parameters within them, including future battery range, distribution of vehicles, mix of public charging etc. Once finalised they will be simulated in the Charge transport model to show how the demand for public EV charging could potentially grow between now and 2050. The model will simulate how EVs are distributed across the population (taking an input from the 'EV-Up Network Innovation Allowance project), where and how often they are driven, and their location and dwell time when parked.

### **Method 2 – Tactical solutions to support EV connections**

Between March and September 2019, Phase 1 of Method 2 was completed, resulting in the creation of the first SDRC report. This report will be formally submitted in the new year when a common report template has been created for Charge.

A substantial program of network analysis has been completed during this initial period. The analysis has created an understanding of the existing and future network connection capacity headroom for EV charge points, the potential for smart EV charge point solutions to deliver benefits to the network, and the potentially avoided reinforcement costs possible through smart charging.

The network analysis program has involved assessing several hundred LV and HV network circuits in both the SPM and SPD licence areas, and applying multiple EV growth scenarios to the three main EV chargepoint use cases for the project (on-street, en-route, and destination). The methods and tools developed in Phase 1 can now be used for the evaluation of LV and HV network investment strategies as part of SP Energy Networks (SPEN) investment planning processes.

Transition into Phase 2 began in September 2019, however early engagement with potential trial participants has been ongoing since Spring 2019.

### **Method 3 – The development of the 'ConnectMore' software tool**

Method 3 combines the learning from Methods 1 and 2 to create an easy-to-use web-based tool that will help users establish the best location for public chargepoints. As such, the bulk of the work for this Method falls later in the project. Effort thus far has focused on understanding user archetypes, developing user requirements for the tool and developing interface specifications that will allow the integration of transport demand and flexible connection solutions. Two stakeholder workshops have been held as part of the software specification 'discovery' process to identify target user groups for the tool and understand how they would like to interact with the tool.



Meetings have been held between EA Technology and the SPEN IT team to understand how the ConnectMore tool will integrate with, and be hosted by, the SPEN IT systems whilst maintaining the necessary levels of security. Discussions are underway to confirm the requirements of the tool and how it will integrate with existing systems, and first tests to extract and transmit asset data in the correct format have been undertaken.

Finally, a procurement exercise was undertaken to appoint a delivery partner for communications and dissemination for the remainder of the project. This appointment is now complete (with work starting in January 2020) and will result in an increase in project visibility and effective dissemination of learning next year.

#### **1.4. Business Case**

As of the end of November 2019 the business case was in line with expectations at the start of the project. The business case has been regularly reviewed throughout the reporting period and this will continue for the duration of the project.

#### **1.5. Learning Outcomes**

Learning points are reviewed by the Charge Project team at regular meetings to establish what has been learned from the activities undertaken and how these should be disseminated. These are detailed in 8 of this report.

#### **1.6. Key Risks**

At this stage, some of the risks identified have not had time to arise but may still do so. Section 10 of this report contains a detailed list of the risks associated with successful delivery (the current Risk Register). This includes all risks captured in the last 12-months.

The key project risks highlighted at this point are:

- Lack of engagement by third parties and/or investors with the completed ConnectMore tool; and
- Presentation of final project outputs too complex (resulting in low engagement).

The project is actively mitigating these risks by engaging in a number of measures including creating a stakeholder panel to review the directions and outputs of the project, stakeholder workshops to secure early engagement with the ConnectMore tool on features and usability and the appointment of a communications and dissemination specialist to ensure that project learning is extracted and delivered in accessible terms.

Early stakeholder events have been successful, and the project is seeking to positively engage with additional stakeholders throughout the duration of the project with the aim of engaging all interested parties at the point of development to ensure that the outputs of the project are well understood, useful, usable and used.



## 2. Project Manager's Report

This year has seen excellent progress against the project plan. The project is delivered through three distinct work packages (or 'Methods') which provide the Charge deliverables and give valuable learning to the UK electricity industry. Details of each of the Methods, and progress against plan in this period, is set out in this section from Section 2.2. below.

### 2.1. Project Management

Over the first 12 months of Charge major progress has been made in line with the initial project plan and there are no major concerns that the project will not be delivered as expected. The impact of the slightly delayed contract signing has been mitigated and consideration is being given over the next month to how aspects of the project can be accelerated in 2020. The following is a brief overview of the project management activities undertaken in this period:

#### Project Governance

Given the number of partners involved and the interdependency of the Methods, robust project governance is essential for the successful delivery of Charge. This project governance has included the establishment of a Project Board and a Project Delivery Team, both meeting at frequent intervals to ensure each partner can provide an update on their progress, deliverables, emerging issues/risks and to coordinate upcoming activities. A dedicated 'Microsoft Teams' for Charge has been established to facilitate this.

As we move forward into 2020 this will grow increasingly important as the three Methods start to converge on one and another and learning is shared. To facilitate effective coordination, further steps are being planned across the project. A standard report format will be developed in conjunction with all the partners and our Ofgem Project Officer. This will ensure all project reports will be consistent in terms of their technical content, terminology and content and ultimately this will make accessing the learning easier for the public.

#### Project Management Updates

- As of December 2019, two of the proposed SPEN project management team positions have been filled, with the remaining two positions expected to be appointed around April 2020.
- All the known project costs have been built into a central financial system enabling regular reporting and tracking of expenditure in line with project milestones and budgets.

#### Stakeholder Engagement

The successful delivery of Method 2 is largely reliant on the participation of stakeholders and the utilisation of their privately funded chargepoints to allow the development and assessment of the performance of smart charging solutions. Whilst Charge has been vehemently supported by several local authorities and government bodies, its requirement for chargepoints for the limited trials in 2020 is out of alignment with the maturity of many of the stakeholders' present plans for EV charging infrastructure. Because of this, an unexpected amount of time has been spent this year in engaging and assisting the aforementioned to develop their EV strategies and working with them to identify potential trial sites. This exercise has also been opened to third party private investors in chargepoint infrastructure to ensure that Charge will have sufficient options for the limited trials next year. This increased level of stakeholder engagement will continue throughout next year to ensure there are also options for participants for the broader trials in 2021.

### 2.2. Method 1 – Strategic Transport and Network Planning

PTV develops state-of-the-art transport modelling software to help evaluate and forecast changes in the transport system. As well as supporting the other project partners and providing specialist

Take care of the environment. Print in black and white and only if necessary



domain knowledge about the transport sector and the likely development of EV demand, PTV has contributed two key pieces of work this year:

### 2.2.1. Transport Model Development

Underpinning the ConnectMore solution is a transport model which provides information about the movement of people; why, when and how. This is an essential piece of intelligence when it comes to planning for the potential impact of EVs on electricity infrastructure.

The Charge transport model is being built in PTV's industry leading software (PTV Visum). Work this year as part of this Method has concentrated on preparing the input data and building the structure of the model, which includes:

- A detailed road and public transport network which provides information on the connectivity of people with places derived from open and commercial sources such as OpenStreetMap and TomTom;
- Information about the population at a level of spatial and segmentation detail that allows for modelling the variation in travel behaviours throughout the region, derived from open and government sources including the National Travel Survey;
- Data regarding the use and the level of attraction for destinations across the SPM region for housing, schools, shopping, business and work, derived from government and open sources such as OpenStreetMap;
- Collation and fusion of real-world and modelled movement data, including Census statistics, traffic counts, the Liverpool City Region Transport Model and mobile phone data.

The model will be finalised so that it can sufficiently reproduce real-world data by January 2020. Work will then continue to model and represent future scenarios and the potential charging behaviours of EVs.

### 2.2.2. EV Futures Scenario Development

Due to uncertainties with the future of EV uptake and usage, a set of scenarios will be tested in the transport model by PTV to assess the impact of charging in a range of plausible futures. The scenarios for Charge have been developed by PTV following thorough engagement with the project partners, the wider SPEN business, and external stakeholders. This includes hosting the following events:

- An ideas workshop held in Liverpool in April to identify all the key factors associated with EVs and how charging them might impact the electricity network;
- A scenario uncertainties workshop held in Glasgow in September to identify and focus on the most important yet uncertain factors. This event helped identify EV cost, EV supply, and battery range as being critical tangible uncertainties, alongside policies relating to infrastructure rollout.
- Two external industry events where the developed scenarios were explained to stakeholders and feedback was sought. A range of responses was captured with participants generally in agreement with the scenarios presented.



Four core scenarios have been developed through this work as summarised in the Figure 1, which embodies the feedback received during the workshops and provides a blueprint for what will be modelled in 2020. The scenarios are underpinned by potential variation in EV uptake (vertical axis) and the development of the public charging landscape (horizontal axis). The *On Course for Net Zero* scenario provides a vision for significant emissions reduction and highlights how EVs will play a part. When modelled, this scenario will help highlight the challenges and opportunities that EV charging will create if ambitious targets are to be met. The other three scenarios describe how the future may progress if the vision isn't met, with variations highlighting how uptake may evolve differently across the SPM region. The modelled outputs of these scenarios will help demonstrate the anticipated demand for EV charging to feed into the ConnectMore solution.

## 2.3. Method 2 – Tactical solutions to support EV connections

The focus in this period has been the completion of the first SDRC (SDRC3) for Method 2. This is composed of three key components, and the progress of each is described in the subsections below. The SDRC was delivered on schedule to SPEN in September 2019.

### 2.3.1. Assessments of Candidate networks in SPM and other licence areas

A methodology for the assessment of LV networks was created in April 2019. This required close engagement with internal SPEN stakeholders, especially the planning and connections teams in the SPM and SPD licence areas. Work was carried out to define the conventional and smart solution 'toolbox' that could be used in a desktop assessment for the licence areas. Once the appropriate approvals from the SPEN IT systems had been obtained in May 2019, SGS and SPEN were able to collect information from the GIS database for use in the network analysis. Data from approximately 200 LV transformers and approximately 1000 LV circuits was collected and used to analyse conventional and smart solutions for dealing with the growth of EV demand on the network. The analysis was completed in August 2019. The methodology used for the analysis can be applied to other licence areas if the relevant data is

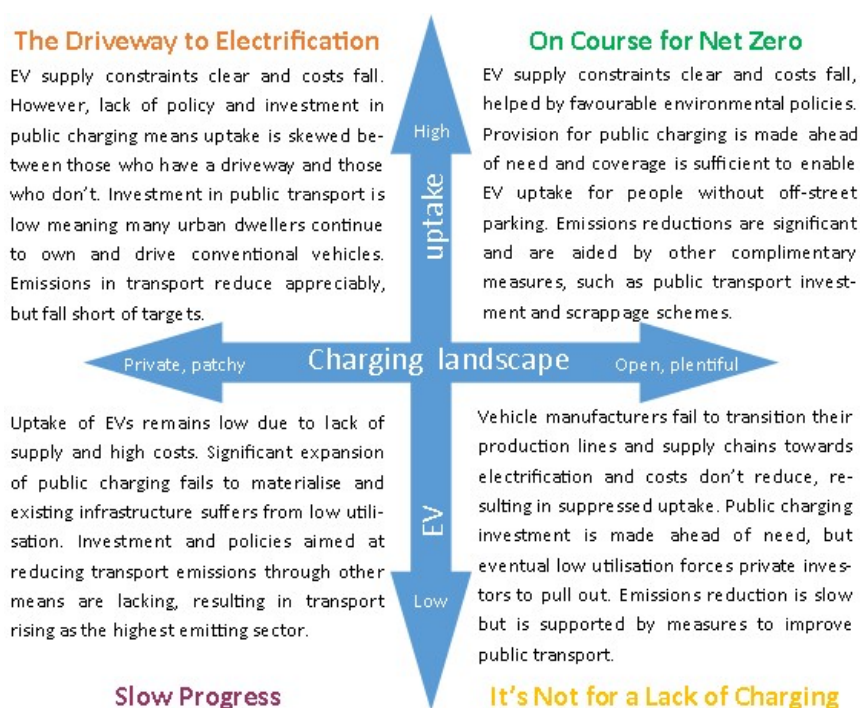


Figure 1 - EV Futures Scenarios

available, and the analysis can be run again taking consideration of updates to growth scenarios (i.e. output from the Method 1 deliverables).

The project explored the possibility of gaining access to LV data from other DNO licence areas as well as SPM and SPD, however due to timescales for the analysis and various data access permissions required this was not possible during Phase 1 of the project.



### 2.3.2. Cost Benefit Analysis

The Cost Benefit Analysis (CBA) was completed during August-September 2019. This work used the output from the assessments of candidate networks and combined publicly available information from Long Term Development Statements (LTDS) and the SPEN Unit Cost Database. The results from the network areas studied was scaled up to provide an indicative picture of the CBA for the SPM licence area, and for the whole of GB.

### 2.3.3. Trial Site Identification

Stakeholder Engagement has been on-going throughout the early stages of the project, beginning in April 2019, with follow up discussions with local authorities and further engagement through stakeholder events.

Early stakeholder engagement has demonstrated that while Local Authorities are keen to deliver EV charging solutions, they lack enough funding to be able to progress with schemes and trials on a timescale that aligns with Charge. Currently, work is on-going with other developers and third-party charge point operators to understand if these parties can collaborate to identify targeted trial locations in the areas studied for Phase 2 trials.

### 2.3.4. Phase 2: Limited Trial Design Early Progress

In October 2019 work began to engage with internal SPEN stakeholders to understand the requirements for the trial. High level requirements for chargepoint operators participating in the trial have been shared with interested parties. More detailed requirements have been captured throughout November and December. The trial is still scheduled for Factory Acceptance Test / Site Acceptance Test to take place in May/June 2019 however this timescale is dependent on the identification of suitable participants for the trial and these participants own requirements. Work to mitigate any delay and risk will be undertaken as far as is possible.

## 2.4. Method 3 – The development of the ‘ConnectMore’ software tool

The learning from Methods 1 and 2 will be brought together in Method 3, through the creation of an easy-to-use web-based tool that will help users determine the best locations for public chargepoints. The tool will allow the user to consider where chargepoints should be placed based on transport objectives whilst giving visibility of electricity distribution network capacity, so the cost of installation can be minimised.

As Method 3 builds on Methods 1 and 2, its timeline is slightly later in the project, and work in the first year has been focused on building user requirements for the tool and developing interface specifications that will allow the integration of transport demands and flexible connections solutions into the tool. Work in these areas is slightly behind schedule due to a slow start to the project but it is now progressing well, and any delays will be recovered before there is any impact on other work.

Another significant consideration for the ConnectMore tool is the integration with the SPEN IT systems that will underpin it and how it will be hosted to provide easy access for users whilst maintaining the necessary levels of security. EA Technology has held meetings with the SPEN IT Architects to agree the operation and integration with existing systems and has received sample asset data in the expected format. This has helped to clarify the system requirements and will ensure that the solution being developed will meet SPEN corporate IT requirements and hence will be ‘BaU ready’ when it is developed.



EA Technology is also paying a great deal of attention to usability, as it is important that any developed software should be useful, usable and used. To this end, we have delivered a stakeholder workshop that identified the groups of users that will have an interest in the software, and this has been developed with a further workshop to build a better picture of user requirements and an understanding of how the users would like to interact with the tool so that they can easily exploit the expected benefits.

Communications and stakeholder engagement will be important aspects of the project, and both aspects will be supported by external delivery partners. A procurement exercise was undertaken to identify a delivery partner for communications and dissemination for the remainder of the project period, and the successful bidder has been appointed. Through this appointment, we will see a marked increase in project promotion next year, and the delivery partner will also lead on dissemination of learning to a wider audience as results become available.

## **2.5. Knowledge Dissemination**

Listening to stakeholders and creating a product that addresses their requirements is a fundamental requirement of this project. As such, the project team has organised stakeholder workshops (detailed above) to gather views and opinions on project inputs, absorb and reflect learning and verify understanding. A full list of stakeholder workshops organised by the project can be found in Table 2 (Section 8).

The project team has also attended many conferences and exhibitions to disseminate learning from the project. A list of conferences, exhibitions and workshops where the project team presented can be found in Table 3 (Section 8).

The following material has been produced to increase understanding of the project aims and disseminate learning:

- A project website was created;
- An animated video was produced; and
- Printed leaflets have been delivered.

As mentioned above, the appointment of a communications and dissemination specialist will see a marked increase in project promotion next year, and the delivery partner will also lead on dissemination of learning to a wider audience as results become available.



### **3. Business Case Update**

As of the end of November 2019 a review of the business case for the project did not raise any concerns or necessitate any changes. The requirement to undertake these reviews over the next 12 months will be maintained, and action will be taken if findings and experiences from the project are contrary to initial expectations. At this stage in the project there is nothing to suggest that the initial business case is no longer valid.

## 4. Progress Against Plan

Table 1: Project Progress against plan

Milestone	Original Due Date (End of Quarter)	Revised Due Date (End of Quarter)	Actual Delivery Date	Mar-19	Jun-19	Sep-19	Dec-19	Mar-20	Jun-20	Sep-20	Dec-20	Mar-21	Jun-21	Sep-21	Dec-21	Mar-22	Jun-22	Sep-22	Dec-22
Signing Contract	Mar-19	Jun-19	Jun-19																
Collaboration Agreement	Mar-19	Jun-19	Jun-19																
Signing Contract	Mar-19	Jun-19	Jun-19																
Stakeholder Strategy / Steering Group management / Communications plan, incl. web, publications etc.	Jun-19	Oct-19	Oct-19																
Model Specification and Data Requirement Report	Jun-19	Sep-19	Sep-19																
Report Defining Methodology	Jun-19	Jul-19	Jul-19																
Stakeholder / Communications / Annual Report: Year 1	Dec-19	Dec-19	Jul-19																
Workshop 1 Report	Sep-19	Oct-19	Nov-19																
Report baseline analysis completed	Jun-19	Jul-19	Jul-19																
Stakeholder / Communications / Annual Report: Year 2	Dec-20																		
Workshop 2 Report	Sep-19	Nov-19	Nov-19																
CBA methodology	Jun-19	Jul-19	Jul-19																
Stakeholder / Communications / Annual Report: Year 3	Dec-21																		
Smart solutions analysis and Q2 report	Jun-19	Oct-19	Oct-19																
Stakeholder / Communications / Annual Report: Year 4	Dec-22																		
Method 1: Model Specification	Sep-19	Oct-19																	
Scenario Planning Framework Report	Sep-19	Nov-19	Nov-19																
CBA report	Sep-19	Oct-19	Oct-19																
Network / Transport Plan integration specification	Sep-20																		
Trial locations defined	Sep-19	Dec-19																	
EV Data Collection Report	Jun-20																		
SDRC 3	Sep-19	Oct-19	Oct-19																
Model Data Collection Report	Jun-20																		
Method 2: Network Modelling for integration into Connectmore	Sep-20																		
Transport Model Build Report	Dec-19	Dec-19																	
Phase 2: interface specification	Dec-19	Mar-20																	
Transport Model Calibration and Validation Report	Dec-19	Jan-20																	
Equipment (strata + licence; other solutions)	Dec-19	Jan-20																	
SDRC 1: Transport & Network Model Interim Report	Dec-19	Jan-20																	
Q4 Report	Dec-19	Dec-19	19-Dec																
ConnectMore Integration Plan	Sep-20																		
Phase 2: Deployment and commissioning Plan	Mar-20																		
Method 3: User requirements & Model specification	Jun-20																		
Data extraction and processing - Data Plan	Jun-20																		
Phase 2: FAT / SATs	Jun-20	Jul-20																	
Network capacity assessment LV	Sep-20																		
SDRC 2: Transport and Network Model Final Report (DRAFT)	Dec-20																		
Network capacity assessment HV	Dec-20																		
SDRC 2: Transport and Network Model Final Report	Dec-20																		
Transport interface development	Mar-21																		
Transport Interface Implementation Report	Mar-21																		
Phase 3: Interface & Functional Design Specification	Dec-20																		
ConnectMore beta (Version 1.0)	Sep-21																		
Findings and User Feedback	Dec-21																		
Transport Interface Testing Report	Dec-21																		
SDRC 4 - Pilot Trial Interim Report	Dec-20																		
ConnectMore OnlineTool (Limited Availability)	Dec-21																		
Finding and user feedback	Mar-22																		
SDRC 9: ConnectMore Online Tool	Jun-22																		
Annual Stakeholder and Dissemination Report 2019	Dec-19	Dec-19																	
Equipment (additional element devices)	Mar-21																		
Integration into BaU systems - integration with existing systems and handover	Sep-22																		
Annual Stakeholder and Dissemination Report 2020	Dec-20																		
Phase 3: Deployment and Commissioning Plan	Mar-21																		
Annual Stakeholder and Dissemination Report 2021	Dec-21																		
Annual Stakeholder and Dissemination Report 2022	Dec-22																		
Phase 3: FAT / SAT	Jun-21																		
Project Closedown Report / ConnectMore Publications	Dec-22																		
Post-trial Analysis Report / Recommendations and standards	Sep-22																		
SDRC 5	Sep-21																		
SDRC 6	Dec-22																		



## 5. Progress Against Budget

Below is a summary of the total project budget position from commencement until December 2019. SPM has contributed to costs in line with the funding arrangements set out in the Project Direction. Costs for the NIC funded elements have been tracked through the project bank account and a certified copy of the statement will be submitted to Ofgem in January.

*Table 2: Project Progress against budget*

Activity	Budget to Date (£k)	Actual to Date (£k)	Variance (£k)	Commentary
<b>Labour</b>	352.36	174.17	178.19	Underspend due to decision to ensure that project fully resourced in years 2 and 3 rather than 1 and 2
<b>Equipment</b>	143.82	0.00	143.82	Forecast spread cost across entire year, in reality these costs are likely to come in in Q4 or Q1 2020/21.
<b>Contractors</b>	1,417.96	1,053.51	364.46	Due to the delayed signing of the contracts a couple of large milestone payments have now slipped into Q4
<b>IT</b>	140.00	0.00	14.00	Forecast spread cost across entire year, in reality these costs are likely to come in in Q4 or Q1 2020/21.
<b>Travel &amp; Expenses</b>	88.00	1.93	86.08	Awaiting expense invoices from two of the partners and addition of SPEN expenses at year end
<b>Contingency &amp; Others</b>	70.01	77.97	7.96	Expenditure in line with forecast, however we have participated in more dissemination / stakeholder events than originally expected
<b>Totals</b>	<b>2,212.78</b>	<b>1,307.58</b>	<b>905.20</b>	



Whilst the variance between the Actual Spend and the Forecasted Spend is significant, it is not a major concern and overall the project is still on track to spend in line with the overall budget. There are several valid reasons behind the variances:

**Labour** – The project budget allocation splits four separate internal resources across four years of the project. Early in the project a decision was made to redistribute this allocation to ensure that the project had its full complement of resources for the middle two years rather than the first two years. Secondly this report was issued prior to the final salary transfer for 2019 taking place, the actual spend is likely to be £60k higher than highlighted above.

**Equipment and IT** – At the project's inception only an indicative timeline was known for these lines of expenditure and the budget was distributed across a large section of the project. As a result, costs forecast in the first year are unlikely to be incurred until Q4 at the earliest, but more likely to commence in Q1 2020/21.

**Contractors** – The delayed contract signing and formal start of the project has had a slight knock-on effect with several of the key deliverables, moving them along one quarter from where they were originally forecast. Because of this and the timing of this report, many of the large end of year deliverables have not yet been invoiced at the end of Q3.

**Travel & Expenses** – As of the time of writing this report the SPEN expenses and those of two of the partners were unavailable for inclusion. Having said this, it is highly likely that the actual spend is considerably lower than originally forecasted at this stage. This is predominantly due to the use of telecommunication tools reducing the amount of physical interaction required and the postponement of the combined dissemination event with UKPN until 2020.

**Contingency** – Whilst broadly in line with expectations we have achieved considerably more than envisaged in the initial year. The vast majority of this expenditure has been tied to SPEN and partners engaging with stakeholders and raising awareness of the project.



## 6. Bank Account

A copy of the bank statement, detailing the transactions of the project bank account since its creation will be submitted to Ofgem in January. The figures in the statement will relate to the NIC funded costs only and not the total project costs. The total value of withdrawals from the NIC bank account will be lower than the NIC element of project costs actually incurred until all transactions have been reconciled. Minor differences in the reconciliation between costs and funding being transferred from the bank account are due to timing of transactions.



## 7. SDRC

This section describes the work to date associated with the project SDRCs.

These are all progressing according to the project plan with no delays expected. The release of SDRC 1 has been delayed until it can be published in a common format for all reports to be established in January 2020.

*Table 3 SDRC progress summary*

SDRC	Status	Due Date	Comments
<b>SDRC 1 – Transport and Network Model – Interim report.</b>	On Track	31/12/2019	
<b>SDRC 2 – Transport and Network Model – final report.</b>	On Track	31/12/2020	
<b>SDRC 3 – Identify suitable EV connection solutions for different locations</b>	Complete	30/09/2019	
<b>SDRC 4 – Pilot Trial Interim Report.</b>	Not begun (on track)	28/02/2021	
<b>SDRC 5 – Pilot Trial Completion/Broader Trials Interim Report.</b>	Not begun (on track)	31/12/2021	
<b>SDRC 6 – Final Report on Network Trials.</b>	Not begun (on track)	31/12/2022	
<b>SDRC 7 – ConnectMore Online Tool - Specification.</b>	Not begun (on track)	31/03/2020	
<b>SDRC 8 - ConnectMore Online Tool – Prototype delivery.</b>	Not begun (on track)	30/06/2022	
<b>SDRC 9 – Project Close Down Report</b>	Not begun (on track)	31/03/2023	
<b>Comply with knowledge transfer requirements of the Governance Document</b>	On Track	End of project 31/03/2023	



## 8. Learning Outcomes

Learning points are reviewed by the Charge Project team at regular meetings to establish what was learned from the activities undertaken, and how this should be disseminated. The following learning outcomes, over the last 12-month period of the project, are detailed below.

The principal learning outcome over the period covered by this report is that stakeholders have required more engagement and encouragement to understand the merits of smart charging solutions than was expected at the start of the project. As a result of this learning point, the project team has devoted more time to stakeholder engagement than planned to fully explain this concept.

*Table 4 Stakeholder engagement workshops hosted by the Charge project*

Workshop Title	Location	Date	Description
<b>Scenario Ideas workshop</b>	Liverpool	April 2019	Workshop run by PTV to help identify all the key factors associated with EVs and how their charging might impact the electricity network.
<b>ConnectMore User Archetypes Workshop</b>	Chester	July 2019	Workshop run by EA Technology to identify potential user archetypes of the ConnectMore tool and develop Personas to represent these User Archetypes.
<b>Scenario Uncertainties Workshop</b>	Glasgow	September 2019	Workshop hosted by PTV to identify and focus on the most important, yet uncertain EV roll out factors. This workshop helped to identify EV cost, supply, and battery range anxiety as critical uncertainties alongside infrastructure roll out policy.
<b>ConnectMore User Interface Workshop</b>	Chester	December 2019	Workshop hosted by EA Technology to develop required features for the tool, and User Interface preferences of potential ConnectMore tool users.

*Table 5 Learning dissemination undertaken by the Charge project team*

Workshop Title	Host	Date	Description
<b>Demand Workshop, Chester</b>	SPEN	April 2019	Charge project manager presented on project at SPEN stakeholder event
<b>North Wales Metro Steering Group</b>	Welsh Government	June 2019	Project members from PTV presented on the project
<b>EV Workshop, Chester</b>	SPEN	June 2019	Project members from SPEN presented on the project and hosted breakout sessions
<b>EV Workshop, Newtown</b>	Renewable Wales/ Open Newtown	July 2019	Charge project manager presented on project and the project team participated in breakout sessions
<b>Optimise Prime / Charge Project team Introductory Workshop, London</b>	UKPN	August 2019	Workshop to allow the Optimise Prime and Charge project teams to meet and share achievements to date
<b>PowerSwarm Workshop: Future Electricity Networks and Ancillary Services</b>	Strathclyde University	September 2019	SGS presented on the project
<b>Connections Stakeholder Workshop, Chester</b>	SPEN	September 2019	Charge project manager presented on project
<b>North Wales EV Workshop, Conwy</b>	Welsh Government / SPEN	September 2019	Charge project manager presented on project and the project team participated in breakout sessions
<b>Cenex-LCV 2019 Millbrook, Bedfordshire</b>	Cenex	September 2019	EA Technology stand to promote the Charge Project and presented on the project in the conference programme.
<b>SPM Low Carbon Futures Conference, Chester</b>	SPEN	September 2019	Project team hosted breakout sessions
<b>Smarter Tomorrow Live, Liverpool</b>		October 2019	Charge team had a dedicated stand, presented and ran a workshop
<b>Low Carbon Network Innovation Conference, Glasgow</b>		October 2019	Charge team hosted a Question and Answer session on the SPEN stand
<b>PTV Innovation Day, London</b>	PTV	November 2019	PTV workshop to explain the project to delegates and share learning. Feedback via an interactive poll.
<b>Green GB week, Liverpool</b>	SPEN	November 2019	Charge team has a dedicated stand and presented on the project
<b>IET Distributed Generation course</b>		November 2019	SGS presented on the project



## 9. Intellectual Property Rights (IPR)

The terms relating to the ownership and use of intellectual property developed under NIC funded projects are set out in the Project Direction and these terms are maintained through the Partner Agreements between SPEN and each of the project partners. No issues in relation to IPRs have been raised in the reporting period, and no future issues are anticipated as all partners are fully aware of the terms of engagement.

Intellectual property developed through previous NIC and NIA funded projects, most notably through the NPg AutoDesign and WPD Electric Nation projects, will be incorporated in the development of the ConnectMore tool thereby demonstrating the wider value of this work to GB DNOs.

## 10. Risk Management

To ensure successful delivery of the expected benefits and learning objectives of the Charge Project, we proactively identify risks to the project and provide mitigation plans. The risk register is updated regularly throughout the duration of the project. All identified risks are listed under one of three major risk areas (technical, commercial and financial) and are set out in Tables 6, 7 and 8.

The most pertinent risks to the project have been identified as:

**Lack of customer engagement** – the lack of engagement by third parties and/or investors in the completed ConnectMore tool. This could result in the benefits of Method 3 of the project not being fully realised. This has been mitigated by several measures including the creation of a stakeholder panel to review the directions and outputs of the project, early engagement with stakeholders during bid developments and the project seeking to positively engage with additional stakeholders during the project.

**Presentation of outputs** – the presentation of outputs at the end of the project being too complex. This may result in third parties and/or investors failing to use the ConnectMore tool resulting in a fragmented roll-out. This has been mitigated by several measures including the creation of a stakeholder panel to review the directions and outputs of the project, early engagement with stakeholders during bid development and the project seeking to positively engage with additional stakeholders during the project.



Table 6: Technical Project Risk

Risk No.	Issue	Risk Description	Potential Impact	Control & Contingency Measures	Overall Risk (2-40)
<b>1.0 Technical Project Risks</b>					
1.2	Network constraints	Identification of issues that are currently hidden e.g. Lack of network capacity in certain parts of the DNO licence area	Need for additional investments not previously considered for ED1 or RIIO 2 price controls	1. Output from method will identify possible flexibility requirements or options 2. Method 2 will explore alternative connection solutions	12
2.12	Desktop studies	Network evaluation finds that network triggers are difficult to categorise and constraints in trial locations are not as prominent as first thought	Reduced value from the trials, leading to reduction in the benefits captured from the NIC funded project	1.Desktop studies and analysis will provide guidance on where to deploy solutions - in network areas with the most concern 2.Constraints or network issues can be simulated using software solutions, and the operation capabilities and benefits of the software can still be demonstrated	12
1.1	Integration of network planning and transport planning	Project unable to integrate network and transport planning data sets	Potential delays to Method 1, which then delay the development of the ConnectMore tool	1. Project partners have extensive knowledge and understanding in areas of expertise 2. Detailed project plan with key interactions identified	10
2.4	Data quality	Insufficient, misrepresentative or poor-quality data from charge points.	1. Reduction in the understanding of charging behaviours and the effects of management 2. Reduction in the learning disseminated for the project	1. Engagement with EV charge point manufacturers to understand data available in advance of the trials 2.Alignment of trial expectations and reporting based on information gathered in stakeholder engagement ahead of trials	10



2.15	Communications	There are communication issues with the telecoms platform meaning that some areas cannot be covered by ANM. Raw data from the charge points is lost due to communication outages.	Communications issues could result in the inability to manage devices and therefore put the success of the trials at risk. Charging transactions may be lost and the data collected will not be statistically significant, therefore unrepresentative of the users' behaviours.	<ol style="list-style-type: none"> <li>1.SPEN to confirm communications already in place in trial locations</li> <li>2.Engage with SPEN comms provided (Vodafone) to minimise risk of unknowns and uncertainties</li> <li>3. Engage with EV Charge Point providers to understand comms requirements</li> <li>4.SPD will carry out site surveys and specify telecoms that will meet the needs of the trial</li> <li>5.In worst case scenario, SPEN can resort to Business as Usual and lay fibre cable for comms</li> <li>6. A continually updated record will be kept of communications reliability</li> <li>7. Selected charge point hardware will ideally have the capability to store charging transactions, therefore data recovery will be possible</li> </ol>	10
3.5	Data quality	Poor LV and HV network data quality prevents the ConnectMore tool being applied at these voltages	Full Method 3 benefits cannot be realised	<ol style="list-style-type: none"> <li>1. Clearly specify required data quality as part of the learning from Method 1.</li> <li>2. Develop methods to fix common problems with network data and include in Method 3.</li> </ol>	10
4.2	Cyber	The innovative connection solution is at risk of disruptive cyber attacks	<ol style="list-style-type: none"> <li>1. Sensitive stakeholder or customer information is stolen</li> <li>2. Control of flexible connection solutions is overridden by hostile agents</li> </ol>	<ol style="list-style-type: none"> <li>1. Dialogue with internal cyber security experts is opened early in the project and maintained throughout</li> <li>2. Precautionary measures and procedures are developed and diligently followed by all project partners throughout</li> <li>3. Standard resilience procedures are followed in the event of a cyber attack</li> </ol>	10
2.2	Implementation of trial schemes	Trial schemes cannot be implemented as specified in the technical design work packages	Failure of scheme to demonstrate the planned functionality, project does not deliver its objectives, additional costs incurred to resolve the issues	<ol style="list-style-type: none"> <li>1. SPEN design team to review technical specifications of schemes</li> <li>2. Demonstrate the feasibility of schemes through desktop studies for selected trial sites</li> </ol>	5



2.9	Data management	High volumes of data leading to IT issues. Unable to store all data during a trial period leading to a loss of data.	Time wasted and reduced understanding of charging behaviours	1.Ensure specification of tools, resources and data meets the needs of the project trials 2.Project partner experience from previous management platform deployments. There is an understanding of the volume of data involved in the trials and the appropriate data management processes to ensure no loss of data.	8
3.8	Reliance on NAVI and Databus	The proposed ConnectMore IT integration plan is reliant on both a Databus being present and the NAVI platform being fully adopted and managed by the business	1. Delay to the release of the ConnectMore tool 2. Additional cost to the project to correct issues 3. Delivery of a system not adoptable as Business as Usual	1. EA Technology IT team to work closely with SUK and NAVI team from early in the project 2. Reliance on NAVI / Databus to be factored in by the businesses support for adoption / delivery of CHARGE	8
3.3	Inadequate learning from Method 1	Method 1 fails to develop a suitable assessment methodology for incorporation into ConnectMore	Full Method 3 benefits cannot be realised	Ensure that the modelling methodology developed in Method 1 is fully documented as part of Method 1 See Method 1's control measures	5
3.4	Inadequate learning from Method 2	Method 2 fails to define a suitable list of solutions to lower connection costs	Full Method 3 benefits cannot be realised	Use solution sets from other projects e.g. My Electric Avenue, Electric Nation	5
3.6	Scalability	Data processing for ConnectMore tool cannot be scaled up to national level	Full Method 3 benefits cannot be realised	Ensure that the modelling methodology developed in Method 1 is fully documented and tested for scalability as part of Method 1	5
2.1	Validity and replicability of trials	Solutions becomes too specific to a single licence area affecting the ability to rollout to GB	Increased complexities for assessment introducing increasing levels of variables	1. Solution will be developed to be flexible to changing technologies to ensure that an evolving picture can be established 2. Robust desktop assessments for several specific locations will be completed to ensure solutions are fit for purpose 3. Desk-top assessments will be completed for other Licence Areas ensuring solutions are not solely designed to cater for SPM network	4



2.10	New tools and processes	Development of new tools and processes for EV connection design involves some complexity and time/cost risk	Increased complexity may increase cost to the business and lower stakeholder engagement, leading to limited benefits gained from the trials.	1. Recognition of the complexity that may be involved in the tool development and accounting for this in the project plan. 2. Engagement with stakeholders to understand attitude towards different levels of complexity in tools, which can then be used to assess the most suitable solutions for trials 3. Review of existing tools in the market for EV and other DER management to compare approaches and ensure best options are trialled	4
4.1	Resources	Enough resources are not available within SPEN to deliver the project	Delay in delivery of the project and impact on quality of deliverables	1. Effective engagement with Director level in SPEN to provide clear understanding about the project size and resources required 2. Use complementary external resources where necessary	4
4.6	Dissemination through SPEN / Iberdrola Website	The contracted plan for Dissemination was through a satellite website ran by EATL. This does not comply with IBE policy as such the Charge website now needs to be run via SPEN / IBE	1. Poor quality dissemination in terms of richness of content if limited by IBE 2. Additional cost to Project 3. Ofgem's expectations not met	1. Communication strategy to be defined by EATL and shared with SPEN Stakeholder Engagement Team 2. Marketing consultant appointed by EATL to work within SPEN branding guidelines and work closely with SPEN to ensure content can be accommodated	8
2.3	Integration to NMS	The equipment provided does not comply with the security requirements and communication protocols used by SPEN corporate systems	Delay in the project delivery resulting in additional costs to redesign and procure fit-for-purpose technical solutions	1. Early engagement with IT 2. Provide clear guidance and requirements for SPEN NMS as part of tendering documents	2



Table 7 Commercial Project Risk

Risk No.	Issue	Risk Description	Potential Impact	Control & Contingency Measures	Overall Risk (2-40)
<b>3.0 Commercial Project Risks</b>					
<b>3.1</b>	Lack of end-customer engagement	Third parties and/or investors do not find the ConnectMore tool useful or interesting	Full Method 3 benefits cannot be realised	1. Creation of stakeholder panel to review direction and outputs of project 2. Early engagement with stakeholders during project bid development 3. Project will seek to engage positively with additional stakeholders during the project (e.g. specific investors, chargepoint installers, vehicle OEMs etc)	<b>21</b>
<b>1.3</b>	Presentation of outputs	Form of outputs is too complex for third parties and investors to effectively engage	Project unable to encourage third parties to invest in key locations resulting in fragmented rollout	1. Creation of stakeholder panel to review direction and outputs of project 2. Early engagement with stakeholders during project bid development 3. Project will seek to engage positively with additional stakeholders during the project (e.g. specific investors, chargepoint installers, vehicle OEMs etc)	<b>16</b>
<b>1.4</b>	Forecasting accuracy	EV uptake in reality may be different to assumptions made and assessed	May result in lack of accuracy in EV charging location optimisation	Assumptions will cover a wide range of scenarios between optimistic and pessimistic EV uptake	<b>12</b>
<b>2.16</b>	Low level of engagement for smart charging solution trials	Lack of / delay to identification of trial sites for smart charging solutions for first round of trials in 2020	Delayed project learning / deliverables	1. Expand engagement beyond Local Authorities / Community Groups 2. Engage CPOs, manufacturers and major leisure / tourism / retail organisations 3. Consider trialling SCS on existing sites and simulate network constraints	<b>12</b>



1.5	Investment Decision	Investment made at locations suggested by the project is not as successful as predicted	This will cause waste of resources and damage the reputation of the project outputs	The optimal charging locations will be indicated as a generic geographical area and will not be pin pointed on a map	12
2.17	Assessment of Potential Trial Sites	Charge will require a high volume of trial sites to be assessed for suitability in 2020 and 2021. This assessment needs to go through official connection assessment channels to avoid providing customers with contradictory information	1. Reputational - this process could be seen as overly bureaucratic by stakeholders 2. High volume of connection assessments by SPEN engineers	1. CHARGE team to assist stakeholders through process and inform them how it benefits them 2. CHARGE team to use agreed rules with PM to limit pass through of speculative requests and requests that will not proceed if 11kV connection required	9
2.14	Knowledge	Knowledge import from other projects	Insufficient sharing of knowledge between this project and other projects happening in the EV sphere	1.SPEN have regular update discussions with UKPN regarding the project Optimise Prime 2. Have participants from other active EV projects sitting on the project steering/stakeholder board to ensure two-way communication between this project and others	12
2.11	Procurement	A risk that procurement of technology to facilitate trials could delay the project	Impact on cost and inability to successfully deliver outputs from Method 2	1.SPEN have already engaged with Local Authorities who are open to having input into the procurement process to ensure they can purchase the correct charge points and participate in the trial	10
2.13	Policy	Changes to EV policy influences EV landscape	Reduced EV uptake and removal of funding/incentives for EV chargepoint deployment, resulting in low stakeholder engagement and reduction of benefits	1.Trials will continue regardless of rate of growth. The need to facilitate new EV connections and manage these will still be required.	10
2.5	Loss of key stakeholders	Trial location stakeholders withdraw, and the potential trial locations are lost	Inability to carry on with proposed trial site resulting in lost learning and inability to deliver learning outputs	1. We have strong support from our trial partners, as outlined by the letters of support, and funding is already committed by them to develop these sites	6



<b>2.6</b>	Charger station usage	Not enough use is made of the charging stations	Limited learning to provide statistically representative conclusions, leading to inability to deliver outputs	1. Provide subsidised EVs to ensure that charge station usage is strong 2. Strong stakeholder engagement with SPEN team allocated with stakeholder and dissemination work package as SPEN contribution to project	<b>6</b>
<b>3.7</b>	Regulatory uncertainty	Changes are made to the way in which connections are charged that renders the functionality in ConnectMore redundant	Method 3 benefits cannot be realised	1. Maintain a watching brief on the outcome of the Ofgem Charging Futures Consultation and amend system functionality accordingly	<b>5</b>
<b>3.7</b>	Supplier lock-in	Single provider of ConnectMore software	1. Cost increase outside the control of SPEN 2. Risk to broader deployment by other DNOs	1. Agreement of IP upfront (i.e. royalty free licence for GB DNOs) 2. Software approach will be documented allowing other third parties to replicate through an open tendering process	<b>4</b>
<b>4.3</b>	Project Partners	Delivery issues due to collaboration of new project partners	1. Failure to deliver in line with project time scales as new partners are engaged 2. Potential of increased costs 3. Difficulty to deliver outputs in timescales of project	1. Partner selection based on track record 2. Proposal from key partners developed in line with project bid 3. Senior management commitment from each partner	<b>4</b>
<b>4.4</b>	Project dissemination	Dissemination activity/events run by project partners do not provide value for money	Reduces the overall impact of the project and prevents the expansion of the learning to additional Licence Areas	1. Stakeholder panel to test dissemination methods and to focus outputs to key groups / audiences 2. Combined dissemination event with UKPN to leverage value for customers 3. LCNI conference to ensure wide stakeholder involvement	<b>3</b>

**Table 8 Financial Project Risk**

Risk No.	Issue	Risk Description	Potential Impact	Control & Contingency Measures	Overall Risk (2-40)
<b>3.0 Financial Project Risks</b>					
<b>2.7</b>	Higher trial costs	Cost of innovative solutions is higher than anticipated	Exceedance of project budget and risk of halting some / all trials	1. Modular aspect of trials reduces overall risk. 2. Extensive experience within the project team in delivering innovation projects and trials 3. Project Partner have a strong history delivering similar trials in the UK	<b>10</b>
<b>2.8</b>	Cost escalation in moving from trial to Business as Usual	Slow transition from trial to Business as Usual results in the projects continuing to fund deployment when the market should have taken over	1. Increase in project costs 2. Benefits are not realised to wider stakeholders or to GB customers 3. Slow expansion to other Licence Areas	1. Recognition of limits of NIC funding in niche trails and not Business as Usual 2. Engagement with potential investors to identify alternative long-term funding routes 3. Creation of stakeholder panel to provide direction and support for the transition to Business as Usual 4. Collaboration with UKPN to ensure replicability with other GB licencees	<b>10</b>
<b>4.5</b>	Higher project costs	Cost to complete the three methods increases	Exceedance of project budget and risk of halting some or all of the project	1. Extensive experience from SPEN and project partners delivering innovation projects 2. Modular aspect of proposal designed to reduce overall risk	<b>8</b>



## 11. Data Access Details

When data becomes available for this project interested parties can request it by following the guidance in the SPEN Data Sharing policy. The following link to this policy also contains further details about the data sharing process,

[https://www.spenergynetworks.co.uk/pages/data\\_sharing\\_policy.aspx](https://www.spenergynetworks.co.uk/pages/data_sharing_policy.aspx).

## 12. Accuracy Assurance Statement

The Project Manager and Director responsible for the 'NIC – Charge Project' confirm they are satisfied that the processes and steps in place for the preparation of this Project Progress Report are sufficiently robust and that the information provided is accurate and complete.

Steps taken to ensure this are: -

- Regular update reports from each project team member for their area of responsibility.
- Evidence of work undertaken by the project team is verified by the section manager as part of their day-to-day activities. This includes;
  - Checking and agreeing project plans.
  - Holding regular team project meetings and setting/agreeing actions.
  - Conducting frequent one-to-one meeting and setting/agreeing actions.
  - Confirming project actions are completed.
  - Approving and signing off completed project documents.
  - Approving project expenditure.
- Weekly updates are received by each section manager of the progress of the work their department is undertaking.
- Director and Senior Management summary reports for the project progress are produced.

Signature:



Geoff Murphy – SP Energy Networks, Project Manager for Charge