



CHARGE



Network Innovation Competition

Project Progress Report
January 2021

Document Version: 1.0
Date: 19 February 2021
Approved by: Geoff Murphy






DOCUMENT ISSUE CONTROL

Version History

Version	Date	Comment	Author
1.0	19/02/2021	Final draft	Smarter Grid Solutions, PTV Group, EA Technology, SP Energy Networks

Final Approval

Version	Date	Role	Name	Signature
1.0	19/02/2021	Project Lead	Geoff Murphy	



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1. Executive Summary

1.1. Summary

2020 has been a very challenging year. Charge has largely weathered the difficulties caused by the COVID pandemic and progress has on the whole, continued to follow the project plan. In 2020 Charge delivered several tangible outputs. Most importantly, it remains on track to deliver the first major customer focussing deliverables in the first half of 2021, with the staged release of ConnectMore.

- PTV Group have delivered a full transport model for the SP Energy Networks Manweb licence area – a first for UK Distribution Network Operators (DNOs).
- Smarter Grid Solutions (SGS) have delivered a draft Functional Design Specification for the Distributed Energy Resource Management System (DERMS) to be utilised for several Smart Charging Connections (SCC) trials.
- A thorough investigation of various network topographies, voltage and constraint location and type has identified that broadly speaking only four types of SCC are required.
- EA Technology have produced a first code release of the Low Voltage (LV) network capacity and Electric Vehicle (EV) charging demand heatmaps.
- Charge has been disseminated at several events throughout 2020 both physically (pre-COVID pandemic) and virtually. This included a joint session with Optimise Prime at the CENEX Low Carbon Vehicle Event as well as alongside all of SP Energy Networks other EV projects at the Energy Network Innovation Conference.
- Despite the lack of physical engagement for most of the year, the projects portfolio of stakeholders has continued to grow. At the same time project awareness has continued to increase through a greater communications presence.

The impact of COVID pandemic has largely been mitigated through the effective use of digital communications to manage the project, engage with stakeholders and for dissemination. Unfortunately, despite best efforts the restrictions have and continue to impact the SCC 'Limited' and 'Broader' trials of Method 2. This impact has been twofold, firstly it has prohibited onsite installations. Secondly it has resulted in several prospective trial sites being placed on indefinite hold until the restrictions have been lifted. To mitigate this Charge has undertaken a fresh wide-reaching recruitment drive and has looked to consolidate the Limited and Broader trials into one large trial, commencing in 2021.

Despite the ongoing pandemic there is very high confidence that the project will continue to progress broadly in line with the project plan during 2021. There is genuine excitement and optimism surrounding the release of ConnectMore, particularly given the increased emphasis on EVs as part of a 'Green Recovery'.

1.2. Project Background

The Charge project is funded through Ofgem's Network Innovation Competition (NIC). The project commenced in January 2019 and will run until March 2023. The aim of the project is to identify appropriate locations for 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 second 12-month period of the project from January 2020 until December 2020. It also sets out work due to be carried out between January 2021 and June 2021.

1.3. Project Progress Highlights

The success of Charge is reliant on the coordination and cooperation of the projects principal partners and SP Energy Networks to deliver the outputs of three 'Methods':

Method 1 – Strategic Transport and Network Planning

Method 2 – Tactical solutions to support EV connections

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

As of December 2020, the progress made under Methods 1 and 3 have broadly been in line with the initial project plan. Any changes to the delivery date of project deliverables have been formally approved by Charge's Steering Group, ensuring that they do not have a material impact on the projects scope and deliverables. In 2021 the project anticipates releasing the ConnectMore Interactive Maps - an industry first combining the transport analysis from Method 1 with the electrical network analysis of Method 3. Together these information streams will allow stakeholders to consider the optimum locations for public charging infrastructure based on predicted demand from EVs and available network capacity.

As outlined previously, Method 2 has faced some significant challenges progressing trials due to the COVID pandemic. As a result, there has been a knock-on effect on SGS delivering several deliverables / milestones in 2020. Despite this there has been major progress within Method 2, in particular an extensive piece of work to identify the types of SCC required. Ahead of the trials a Functional Design Specification for the DERMS has been drafted. This task proved more challenging than envisaged because several options for the deployment of the DERMS required consideration. At the close of 2020 Method 2 has a clear path forward for successful delivery, but we will need to be vigilant as several key risks to delivery remain.

1.3.1. Method 1 – Strategic Transport and Network Planning

PTV Group, the project partner delivering Method 1 in the Project, has developed a suite of transport models for the project to help identify the potential electricity demand and charging requirements for EVs in the future. PTV have used their leading strategic transport modelling software Visum to build and calibrate a representative base year model for the entire SPM licence area, which was completed in early 2020.

PTV has also developed a set of future scenarios relating to EV uptake and anticipated charging behaviour. The scenario definitions have been incorporated into a set of forecast models alongside the travel pattern data and land-use and demographic data. Work this year has focussed on developing a method to anticipate EV uptake across the region and to model the charging requirements of these vehicles. Using this approach, scenario model results have been produced for four scenarios and six years. Data formats have been agreed with EA Technology with model results transferred for integration into ConnectMore.



Following an initial release of scenario model results, several consultation sessions have been held with key stakeholders in the region. These sessions provided future users with an early glimpse of the transport model data and ConnectMore, including how the data might be presented and what sort of information will be accessible. Feedback from these sessions has been incorporated into model development with tweaks made in the latter part of the year ahead of the release of the ConnectMore Interactive Maps in the first half of 2021.

With PTV's main element of the project complete, work next year will focus on disseminating the results and developing use cases for the model data to help guide stakeholders using the tool. In addition to the four core scenarios already developed, some additional scenarios will be explored, for instance, to understand the impacts on energy demand from cold weather. Finally, insight from the transport model research and development will be shared with the industry so that the approach can be implemented elsewhere in the country.

1.3.2. Method 2 – Tactical solutions to support EV connections

Smarter Grid Solutions (SGS), the partner that is delivering Method 2 of the project, has worked closely with SP Energy Networks to support the process of developing integration processes for the target trial sites. This includes standard pro-forma for systems integration which has been shared and completed by several prospective trial partners. This activity alone has generated new learning on the functionality of a wide range of charging systems. It has highlighted the limitations of some systems to be integrated into SCC schemes. To undertake this work SGS along with SP Energy Networks have entered into several Non-Disclosure Agreements (NDAs) with Chargepoint Operators / Manufacturers as well as a Memorandum of Understanding (MOU) with partners willing to be involved in the trials.

A Functional Design Specification (FDS) for the initial trial phase has been submitted to SP Energy Networks for approval in early 2021. The FDS includes the provision of a central DERMS platform that will be utilised to manage / observe multiple trial sites. The FDS has undertaken several rounds of development as the decision on where to host it changed during the year. Originally it was intended to be a standalone physical platform, but the opportunity arose to consider integrating with a central DERMS platform being installed by SP Energy Networks to manage Distributed Energy Resources in North Wales. Ultimately, whilst this would have been the optimum solution, the timing would have been too tight to ensure that the Method 2 deliverables were achieved. The decision was therefore made to deploy a stand-alone cloud based DERMS platform. This would enable the development and deployment to proceed at pace without the requirement for hardware that would not be required long term.

In parallel to the development of the DERMS platform, SGS have been working alongside SP Energy Networks as well as several potential trial participants to develop detailed plans for the first round of 'Limited' trials. Two of the three sites were ultimately placed on hold, despite the support from the chargepoint owner, as it became apparent that the manufacturers of the installed units were unable or unwilling to develop the modifications required to integrate with the SCC scheme. The plans for the third site 'SGS Labs'¹ in Ellesmere Port has been impacted by the COVID pandemic because onsite access is currently prohibited. Despite this, an agreed Commissioning Plan is in place that should enable the installation and trial to commence at earliest opportunity.

¹ SGS Labs is a Swiss inspection, verification, testing and certification company with no ties to Smarter Grid Solutions other than a shared acronym



Work in early 2021 will concentrate on developing a detailed plan for the identified sites for the Broader trial taking place in the Summer.

The impact of the COVID pandemic and the delays to finalising the FDS for the DERMS platform have had a major impact on the completion of several Method 2 milestones during 2020. Whilst these delays are concerning, they are expected to be addressed in the delivery programme for 2021 and pose no immediate risk to the successful delivery of Method 2.

1.3.3. 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. The focus at the beginning of the year was on compiling the ConnectMore User Requirements and Specification report using the information gathered in the stakeholder workshops at the end of 2019. This Successful Delivery Reward Criteria (SDRC) report shows the functional and non-functional requirements and an initial set of wireframes for the tool’s User Interface. The second report which makes up SDRC 7, the ConnectMore Data Transfer and Processing Plan, was developed through consultations with SP Energy Networks IT and data teams and highlights the high-level architecture and the data required to enable the tool to provide users with an understanding of: electricity network capacity, EV charging demand and connections costs (including for flexible connections).

The latter half of the year has seen the software development get underway. In order to bring maximum value to stakeholders at the earliest time possible the project team decided to bring forward the development of the Transport Model interface in ConnectMore. The ‘first code’ version of the heatmaps containing both the EV charging demand (based on PTV’s Transport Model) and LV network capacity are being made available to SP Energy Networks at the end of 2020. This will be utilised to deliver early insights and use cases for key stakeholders and prepared for launching to the public in March 2021. By summer 2021 ConnectMore will be developed to integrate basic functionality for High Voltage (HV) network capacity assessment and for EV chargepoint connection budget estimation too. This version will flag to users if a SCC may be viable for their site.

Following the early engagement with stakeholders in 2019 the project team have continued engagement activities via virtual webinars and conferences and bespoke one-to-one sessions with interested parties.

1.4. Business Case

As of December 2020, the original business case has not undergone a detailed review, however the project team has remained vigilant to any new learning or outside influences that may trigger a thorough review. Naturally the project will undertake a review upon the delivery and analysis of key stakeholder deliverables such as the Transport Data, ConnectMore tool and detailed options for Smart Charging Connections. The government announcement of a ban on the sale of new petrol and diesel vehicles in 2030 has made the work that the Charge project is doing even more timely and relevant.

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

2020 has clearly demonstrated how project risk can change rapidly and unexpectedly. At the start of 2020, a global pandemic was not a consideration. As the year progressed, the COVID pandemic quickly impacted, and has led to some uncertainty going forward. As a result, the key risks contained within Section 10 of this report have significantly altered from those identified last year. The following four major risks to the successful delivery of Charge have been identified:

- Low customer utilisation of the ConnectMore tool
- Low level of participation / candidate sites for SCC trials and loss of participants
- Integration of ConnectMore with NAVI and SP Energy Networks IT Systems
- Treatment of Meshed Network Assessments within ConnectMore

Section 10 of the report provides a brief overview of the control measures in place for each of the above, as well as a table of the full list of Technical, Commercial and Financial risks to the project.



2. Project Manager's Report

2020 has been a very challenging year. Charge has largely weathered the storm and progress has mostly stayed on track with the project plan. This progress is testament to the commitment of the project team and their ability to seamlessly adjust to working from home. This is especially commendable for several new project team members who joined during the restrictions.

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

The progress made during the second full year of the project has been broadly in line with the initial project plan with the exception of Method 2 as covered above. At the time of writing, there is no major concern that any of the Methods will fail to deliver their outputs as expected and the successful delivery of Charge will be achieved. There are however ongoing issues surround the COVID pandemic that will need to be closely monitored and taken into consideration during 2021 to ensure Method 2 is able to be successfully delivered.

Careful consideration will also need to be given to ensure the success of Methods 1 and 3 are not impacted by COVID restrictions. In 2021 we expect to release two variants of the ConnectMore tool to the public, namely the ConnectMore Interactive Maps (Q2) and the Connection Cost Estimation tool (Q4), albeit internally to SP Energy Networks. It is increasingly likely that all stakeholder engagement leading up to these releases, subsequent support and feedback will need to be done digitally rather than using conventional face to face engagement. Given the experiences of 2020 we believe that this is something that Charge is well placed to achieve.

The following is a brief overview of the project management activities undertaken in this period.

2.1.1. Project Governance

Charge has continued to utilise the Project Governance measures put in place during the first year of the project. At the heart of this is a dedicated 'Microsoft Teams' established for Charge. This provides all the project partners with access to the same suite of reports, tools, files etc. It also facilitates audio/visual communication between the Project delivery team.

The project delivery team has continued to meet fortnightly to provide updates on each partner's progress, actions required from others, highlight key risks and to coordinate upcoming stakeholder engagement / dissemination activities. These meetings are supplemented by weekly calls between SP Energy Networks and each of the individual partners as well as dedicated meetings to collectively work on aspects of the project.

Central to ensuring Charge remains to deliver its outputs are our regular Project Board Meetings as well as keeping the Ofgem Project Officer abreast of key developments / changes. The Project Boards constitute of Directors from each partner as well as their respective Project Leads and provide the chance to consolidate the projects overall progress against the original project plan and seek approval for any minor change requests. In a similar vein, Charge has held two meetings with the Ofgem Project Officer, highlighting the progress made and any changes made to the delivery plan.



It is envisaged that both activities will continue at a greater frequency during 2021 to align with the increased delivery of outputs.

Project Governance will be increasingly important in 2021 as the findings from each of the Methods start to merge into outputs and deliverables as well as the associated dissemination. This has already begun with the integration of the PTV Transport Model data into the EA Technology hosted ConnectMore Interactive Maps. In 2021 we will see further integration of ConnectMore with several cooperate systems within SP Energy Networks, likewise with the SGS DERMS Platform.

2.1.2. Project Delivery Team Update

- As of October 2020, the full SP Energy Networks project management team was in place with the Lead Engineer and Stakeholder and Communication Lead positions being filled by Alastair Oldfield and Samantha Wallace respectively. These recruitments were several months behind when originally scheduled but will now enable the positions to be filled full time for the remainder of the project.
- During 2020 the Project Lead from SGS transitioned from Laura Kane to Tom Rafferty.
- During 2020 the Project Lead from EA Technology transitioned from Adrian Vinsome to Elaine Meskhi.
- Catalyst Communications were appointed as the Communication Lead for Charge.

2.1.3. Project Finance Reporting

The central financial reporting tool for Charge has been given a major overhaul during 2020 to ensure it meets the full reporting requirements of the project. The new tool providing greater visibility of expenditure against the original project plan as well as the projects overall operational budget. The tool tracks payments against the project milestones and extrapolates the predicted spend at the end of the project. The tool also facilitates the completion of the NIC Project Table (CV37) in the annual Regulatory Reporting Pack.

2.1.4. Stakeholder Engagement

Since inception this has been an essential element of Charge, however in 2020 it became increasingly important. The engagement has loosely fallen into two categories, the first centred around the recruitment of SCC trial participants, the second on the end user requirements of the ConnectMore tool.

2.1.5. Trial Recruitment

Extensive work has been undertaken over the course of 2020 to generate participation in the SCC trials. The project team have undertaken extensive conversations with organisations and representatives of the following stakeholder groups:

- Local Authorities (including assisting them to develop EV Strategies)
- Chargepoint Operators
- Chargepoint Manufacturers
- Owners of prospective large scale EV charging hubs / depots
- Leisure and Retail site operators
- Chargepoint installers
- Employers considering workplace charging schemes



Whilst it was not the primary focus of this engagement, it has generated substantial new insight into the willingness to adopt and provide flexibility. This is a key learning output of the project and given that these insights were captured informally the project will look to substantiate them during 2021.

Method 2 identified four types of SCC that would broadly provide a technical solution suitable for all combinations of network voltage, topography, constraint types and location. Internally we aspired to recruit two trial sites for each SCC, eight in total. Given our position at the end of 2020, this now appears unlikely, with 4-5 physical trials now more likely, with some sites being utilised to assess more than one SCC.

Over the course of 2020 project records show that we had entered dialogue about over 30 trial sites, with several even going as far as signing a Memorandum of Understanding (MoU) with SP Energy Networks and SGS. As the discussions / year progressed the list began to dwindle as the suitability of the site and / or the appetite of the prospective partner declined. The ongoing COVID pandemic with resulting continued lack of certainty of when staff / customers would return to site was a major factor. Other reasons sites fell away include:

- Upon further understanding of the SCC the chargepoint owner was unwilling to adopt a flexible connection based on concerns of how it would impact their customer proposition. This was a very typical for sites consisting solely of rapid chargepoints.
- The scale of the chargepoint installation was too low to warrant a SCC or generate sufficient insight into their performance. In many cases the chargepoint owner was unable / unwilling to consider the installation of additional chargepoints at sites. Whilst new learning would be generated from talking to a range of chargepoint management systems, there would be little gained from the deployment of the SCC.
- New learning was generated through considering several sites in detail only to find that the chargepoints deployed / chosen were technically incapable of being operated in a SCC scheme. This highlighted several key technical requirements for chargepoints that are to be utilised in SCCs. It also ruled out solutions from several major chargepoint manufacturers / operators in the market.
- The timescale for deployment naturally ruled out several sites, particularly those that will be rolled up into the EV strategy of Local Authorities or require an 11kV connection. In order to be considered for the trials, Charge has had to focus on sites that have a high degree of certainty to be operational by June 2021.
- Lastly, in many cases there was appetite from the chargepoint owner, but they were unable to justify the resulting resource requirement from themselves or their Chargepoint Operator (CPO) at the present time. Both parties recognised the problem that SCCs are looking to address, but it is not an issue that was causing them immediate cause for concern.

Given the impact of COVID pandemic and the above barriers, Charge undertook a major recruitment drive for additional trial participants in late 2020. Whilst this did not generate a mass influx of new sites, there are now several new viable options being considered further in early 2021.

2.1.6. End-User Engagement

In 2021 Charge will release the ConnectMore Interactive Maps to our stakeholders and will gear up for the release of the ConnectMore Connection Cost Estimation tool. The success of both facets of ConnectMore will be end-user adoption. To guarantee this, Charge has continued to undertake extensive engagement to ascertain the requirements of the end users. In 2021 this will continue at pace leading up to and following the launch of the ConnectMore Interactive Maps and then again for the ConnectMore Connection Cost Estimation tool. We are confident that this engagement can be



effectively delivered despite the likely ongoing COVID pandemic restrictions. The ConnectMore Interactive Maps and ConnectMore Connection Cost Estimation tool are eagerly anticipated by our stakeholders.

In late 2020 the main focus of the engagement was on the presentation and functionality of the Transport Model data within the ConnectMore Interactive Maps. This is further outlined in the Method 1 section that follows.

2.2. Method 1 – Strategic Transport and Network Planning

PTV Group, who are responsible for delivering Method 1, develop state-of-the-art transport modelling software to help represent the movement of people and goods, evaluate transport systems, and inform policy and investment decisions. For the Charge project, PTV is providing specialist domain knowledge about the transport sector, undertaking research into the future use and impact of EVs, and developing a series of models to help understand future energy demand and charging requirements.

Three key areas of Method 1 have been progressed this year, largely unaffected by the COVID pandemic:

2.2.1.EV Scenario Modelling

In the early part of the year, work on the Charge base year transport model was completed. This model contains a detailed representation of transport networks, population and land use, and travel patterns across the SP Manweb region. Detailed information on car usage is represented, including where they are driven, how far they travel, and how long they are parked. Trip patterns have been calibrated using observed data sources, including mobile phone data, traffic counts, and travel survey information. Figure 1 shows a representation of car traffic patterns.



Figure 1: Car traffic patterns in the Wirral and Merseyside



In 2019, a series of scenario planning workshops were held to consider the range of factors that might impact on future EV charging and infrastructure requirements. The scenarios consider differing futures based on what might happen if EV uptake is high or low, and if infrastructure rollout is sparse or plentiful. Work this year has involved fully quantifying the assumptions and inputs for each scenario and representing these conditions in the transport model.

Modelled results have been produced for each of the scenarios in 5-year increments from 2025 to 2050. In each one, private EV uptake is modelled based on scenario factors, income levels, car ownership rates, and housing type including off-street parking availability. This has been combined with detailed trip patterns from the model to help understand how far EVs are likely to travel, where vehicles are likely to reside throughout the day, and what their energy and charging requirements could be. Insights from the models include:

- Scenario-based EV uptake forecasts across the Manweb region, available for every Lower Super Output Area (LSOA). This is a Census land-parcel representing areas with an approximate population of 1,500 people,
- Energy requirements from EVs, split by location type: Residential off-street, Public residential, Public destination, Workplace, Public en-route,
- Likely dwell time profiles of EVs based on characteristics of activities taking place each zone,
- Infrastructure requirements for each scenario at LSOA level, including how many charging points by type might be needed to serve the demand,
- Load growth and connection-based growth across the Manweb across time (based on EV numbers and infrastructure preferences).

2.2.2. Integration with ConnectMore

Scenario results from the Transport Model are being fed into ConnectMore – an online tool being developed by EA Technology which will combine demand estimates from the transport model with electricity network capacity data and designed to provide stakeholders in the region with better information to aid chargepoint installation. ConnectMore Interactive Maps are being released to the public in 2021 so work this year has focussed on integrating the transport model results into the development of ConnectMore. Working with EA Technology, PTV have helped define the format of data for transfer, provided data for testing, and helped to specify the appearance and functionality of the tool. Regular meetings have been held between the project partners to achieve this.

2.2.3. Transport Model Consultation

Ahead of the launch of the Transport Model results within ConnectMore, PTV, EA Technology, and SP Energy Networks have been engaging with stakeholders to show them the tool, understand how they might use it, and receive feedback. Several transport model consultation sessions have been held with the following stakeholders:

- Franklin Energy (CPO)
- Liberty Charge (CPO)
- Ubitricity (CPO)
- Warrington Borough Council
- Newtown Community Organisation
- Welsh Government and Gwynedd Council
- Liverpool City Council
- Knowsley Council



Feedback from these sessions has been vital in gauging how the transport model data will be used and interpreted. Following the sessions, which took place in Autumn 2020, feedback was collated and used to inform some changes to the modelling approach – including the degree to which income might influence EV uptake, and how public on-street charging is defined and modelled. These updates have been incorporated into a final set of runs for the transport model with results being passed to EA Technology in December 2020 ahead of the launch of ConnectMore in early 2021.

2.3. Method 2 – Tactical solutions to support EV connections

2.3.1. Smart Charging Connections

Early in the year a comprehensive review of more than 80 combinations of network voltage, topography, network constraint(s) and their location were investigated. This piece of work identified that broadly speaking, only four types of SCC scheme would be required to provide a technical alternative to reinforcement:

1. Timed Capacity Connection Scheme
2. Customer Load Management Scheme
3. Locally Managed Constraint Scheme
4. Centrally Managed Constraint Scheme

These schemes increase in complexity from 1 through to 4. Each scheme has its own pros and cons. The recruitment of trial participants was centred on finding sites capable of demonstrating these four schemes.

2.3.2. Limited Trials

As outlined previously, Method 2 has felt the impact of the COVID pandemic more than any other aspect of the project. The initial focus in 2020 was to develop candidate trial sites for the intended 'Limited' trials commencing in June 2020.

Working alongside SP Energy Networks, SGS entered a MOU with several prospective trial participants. Once in place, the Charge project team was able to engage with the chargepoint owners, their selected chargepoint provider and installer to develop a suitable solution to facilitate the SCC trial. Three sites, encompassing 76 Public Chargers (>0.5MW) were taken forward for the Limited Trials. Two of the sites were public workplace / destination chargepoints, owned by a local authority and the other site being a workplace charging hub. The engagement with the partners at each location provided substantial new learning on the requirements of each stakeholder, as well as the limitations of certain chargepoint systems that will prohibit their inclusion into a SCC without the need for additional hardware / communication capabilities. To aid further recruitment, SGS developed processes to document the on-boarding and evaluation of trial sites, and to record the specific details of the site, including connection type, constraint type, and details of system integration. This process will help deliver a standard system solution.

The onset of COVID restrictions slowed progress at all three sites, as the partners at each site focus shifted to their new working arrangements and in some cases furloughing. It became apparent in March that the planned June start was now unlikely, but with an expectation that the Limited trials would be delayed into late 2020 once restrictions were eased. Unfortunately, the restrictions never eased for long enough to restart the onsite installation work and, in the case of the two local authority



sites the trial development ended abruptly when the chargepoint operator removed their support. Alternative solutions for these sites are being explored for the 'Broader' trials in 2021.

In the Autumn the decision was made to delay the start of the 'Limited' trial of the workplace SCC into early 2021, effectively creating one large 18-month combined trial.

2.3.3. Broader Trial Recruitment

Throughout 2020, both SGS and SP Energy Networks have conducted extensive stakeholder engagement as outlined in 2.1.5. As of the end of December, there are approximately 10 trial sites under consideration for the combined Limited/Broader trials. The focus during early 2021 will be refining this list of potential sites to ideally take forward enough trials to demonstrate each of the four SCC schemes. Given the ongoing uncertainties caused by the COVID pandemic it is expected that at least one of the 4-5 participating trial sites will be a SP Energy Networks site providing certainty of guaranteed enduring access.

2.3.4. Trial Design Progress

Despite the limited onsite progress in 2020, significant headway has been made capturing the requirements for the Limited Trials and the drafting of a core 'Functional Design Specification' (FDS) for the combined trials. As outlined earlier, the FDS has undergone several drafts as options for its inclusion alongside existing DNO systems and upcoming DERMS platform were considered. The FDS now focusses on the delivery of a cloud based DERMS solution that can be utilised to operate and monitor the SCC schemes to be trialled.

An 'Installation and Commissioning Plan' has been developed for the first site, ready for implementation once the site owner provides the team with approval to recommence onsite work.

Factory Acceptance Test / Site Acceptance Test is expected to commence in February/March 2021 subject to site availability and COVID restrictions permitting. This procedure will initially be applied at the first trial site, before then being undertaken at the other Broader trial sites ahead of the trial commencing in June.

The trial design has now been updated to mitigate the potential impact of the COVID pandemic as far as possible.

2.4. Method 3 – The development of the 'ConnectMore' software tool

This Method has also progressed through 2020 largely unaffected by the COVID pandemic. 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 the forecast EV charging demand (for a chosen scenario and year) and the available capacity for connections to the existing network, so that the least cost, shortest duration connection site can be chosen.

At the end of year two a 'first code' release of the heatmaps element of the tool, containing both EV charging demand and LV network capacity, is being made available to SP Energy Networks for testing and website integration in preparation for a Q2 launch to the public.



2.4.1. ConnectMore Specifications

The 'Discovery Phase' was concluded by compiling the information gathered in the stakeholder workshops at the end of 2019 into a matrix to create a MoSCoW (Must, Should, Could and Won't ranking system) prioritised list of functional and non-functional requirements. From these, an initial set of wireframes for the User Interface was created. This material, alongside the anticipated user journeys through the tool and some proposed visualisations for the transport model interface, was shared with stakeholders and presented in the SDRC report, 'ConnectMore User Requirements and Specification'.

In consultation with SP Energy Networks IT and data teams EA Technology also prepared the 'ConnectMore Data Transfer and Processing Plan'. This SDRC report details the high-level architecture for the tool and the various data sources, formats and processing required to enable the tool to provide users with an understanding of: electricity network capacity, EV charging demand and connections costs (including for flexible connections).

2.4.2. Software Development Progress

The latter half of the year has seen the software development get underway. In order to bring maximum value to stakeholders at the earliest time possible the project team decided to bring forward the development of the Transport Model interface in ConnectMore. The 'first code' version of the heatmaps containing both the EV charging demand (based on PTV's Transport Model) and LV network capacity are being made available to SP Energy Networks at the end of 2020. This will be utilised to deliver early insights and use cases for key stakeholders and for preparing for launch to the public in March 2021.

Following early engagement with stakeholders in 2019 the project team have continued engagement activities via virtual webinars and conferences and bespoke one-to-one sessions with interested parties. Internal stakeholder engagement with SP Energy Networks staff has also increased. To aid dissemination and engagement EA Technology started producing short video demos every 4-6 weeks showcasing the changes and updates to the user interface and described the upcoming plans. The development has already encompassed a number of iterations of the tool with the latest format offering an intuitive 'wizard', guiding the user through a small number of steps to aid them in configuring the heatmaps for their individual needs.

2.5. Knowledge Dissemination

Listening to stakeholders and creating a product that addresses their needs is a fundamental requirement of this project. To support this aim, a Stakeholder Engagement specialist was recruited as a dedicated member of the SP Energy Networks Charge team during the period covered by this report. The reporting period covers time impacted by the COVID pandemic, preventing face-to-face gatherings and interaction. The project has successfully mitigated this issue by carrying out more dissemination and engagement via on-line events, webinars, conferences and one-to-one stakeholders briefings.

To assist recruitment of trial sites from a broad range of use cases, knowledge dissemination has been used increase the project profile.

The project team has organised stakeholder workshops 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 (face-to-face and virtual) can be found in Table 2 (Section 8).



The project team has also attended many conferences and exhibitions (face-to-face and virtual) 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:

- The project website was updated,
- A trial site recruitment leaflet was produced,
- Articles have been placed in selected publications,
- Project quarterly newsletter was begun, and
- An animated video to explain smart charging is being produced.



3. Business Case Update

As highlighted in Section 1.4, as of the end of 2020 the original business case has not warranted an update in light of new findings, project progress or the changing landscape of EV adoption in the UK. The project delivery team remain vigilant to any factors that could have substantial impact on the existing business case. 2021 will potentially offer the learning required to warrant a revisit of the business case, this will be off the back of the release of the ConnectMore Interactive Maps and a greater understanding of the SCCs.

The project bid was written at a time when it was thought that between 50-70% of new car sales in 2030 would be for EVs with the announcements made by the government last year we now know it will be 100%. This change makes the work that the Charge project is doing even more timely and relevant.

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																	
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																	
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 projects Actual spend at the end of December 2020 compared to the expected Budget spend at the end of the Regulatory Year (March 2021). The latter taken directly from the original NIC submission. 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 Mar-21 (£k)	Actual Date Dec-20 (£k)	to Variance (%)	Commentary
Labour	963.22	470.76	-51%	Under spend due to reallocation of resources to years 2 and 3 rather than 1 and 2. As of October 2020 the project is fully resourced. This variance will naturally reduce over the course of 2021.
Equipment	145.17	145.17	0%	DERMS procured via Smarter Grid Solutions.
Contractors	3,473.71	2,240.2	-36%	Under spend due to delayed delivery of several milestones across all 3 Methods. The largest financial impact is the delayed Method 2 Limited Trials.
IT	125.00	6.5	-95%	The Budget forecasted key IT expenditure in years 2, 3 and 4. These costs are unlikely to start until early 2021 when ConnectMore is scheduled for release.
Travel & Expenses	148.72	33.84	-77%	Under spend due to impact of COVID restrictions on physical meetings and events.
Contingency & Others	105.88	91.55	-14%	Expenditure in line with forecast, however we have participated in more dissemination / stakeholder events than originally expected.
Totals	4,961.70	2,987.63	-40%	The anticipated spend by the end of March is £3,492k, with a likely under spend of -30%.



Whilst the variance between the Actual spend as of December and the Forecasted spend for the end of March is significant it is not a major concern at the time of writing. Project expenditure is largely driven by milestone payments to contractors. For each Method there have been slight delays achieving milestones. In most instances the changed delivery date has been agreed via a formal change request. It is not anticipated that any milestones will not be achieved.

Further details on budget variances:

Labour – The project budget allocation splits four separate internal resources across the 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. As of October 2020, the SP Energy Networks Charge project team was fully resourced in line with the bid document. This variance will now start to reduce month on month.

Equipment – To facilitate the Limited and Broader Trials under Method 2, SGS were contracted to supply a Distributed Energy Resource Management System (DERMS). The delivery of the DERMS was formally signed off during 2020 ahead of the trials.

IT – The original Budget forecasted key IT expenditure at the start of years 2, 3 and 4. These costs are unlikely to occur until early 2021 when integration of the ConnectMore tool with SP Energy Networks IT systems commences.

Contractors – As highlighted above, there have been delays delivering milestones across each Method. The delay to Methods 1 and 3 is minor, and both are expected to be in line with the budget forecast by the end of March. The delays with Method 2 have been more severe due to the impact of the COVID pandemic limiting the progression of the Limited Trials in 2020. If the COVID pandemic does not have further impact in on the combined Limited/Broader Trials in 2021 actual spend should quickly realign itself with the original budget.

Travel & Expenses – Prior to the COVID pandemic, it this was a part of the budget that the project would be unlikely to under spend compared to the original budget. The travel restrictions caused by the pandemic have had a major impact on this part of budget and will continue to do so in 2021. The inability to meet physically has been largely mitigated using telecommunications and on-line forums.

Contingency & Others – This item is predominantly SP Energy Networks Stakeholder Engagement expenditure. The present position as of December and the anticipated position at the end of March is broadly in line with the budget. It is anticipated that the project will need to undertake significant stakeholder engagement during the remaining years of the project. As such the project may require additional funding in this area. The Project Board will look at reallocating budget from one of the under-spending elements if required.



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.

Table 3 SDRC progress summary

SDRC	Status	Due Date	Comments
SDRC 1 – Transport and Network Model – Interim report.	Complete	31/12/2019	
SDRC 2 – Transport and Network Model – final report.	On Track	31/12/2020	
SDRC 3 – Identify suitable EV connection solutions for different locations	Complete	30/09/2019	
SDRC 4 – Pilot Trial Interim Report.	Delayed	28/02/2021	<p>Due to restrictions put in place to manage the COVID pandemic the Pilot ‘Limited’ trials have been merged with the ‘Broader’ trials commencing June 2021.</p> <p>As a result, SDRC 4 will (subject to approval) be merged with SDRC 5 and 6.</p>
SDRC 5 – Pilot Trial Completion/Broader Trials Interim Report.	Not begun (on track)	31/12/2021	
SDRC 6 – Final Report on Network Trials.	Not begun (on track)	31/12/2022	
SDRC 7 – ConnectMore Online Tool - Specification.	Complete	31/06/2020	
SDRC 8 – ConnectMore Online Tool – Prototype delivery.	On Track	30/06/2022	
SDRC 9 – Project Close Down Report	Not begun (on track)	31/03/2023	
Comply with knowledge transfer requirements of the Governance Document	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
Scenario Uncertainties Workshop	Virtual	April 2020	Workshop hosted by PTV to
Transport in ConnectMore Focus Group	Virtual	May 2020	Workshop hosted by EA Technology to introduce potential local authority users to ConnectMore (particularly the transport elements). The aim of the workshop was to understand what local authority users wanted to achieve by using ConnectMore.
ConnectMore Transport Heatmaps User Interface Workshop	Virtual	September - December 2020	<p>A series of 1:1 workshops have been completed by SP Energy Networks, EA Technology and PTV to understand in detail how stakeholders currently identify and assess prospective locations for charging infrastructure. The data available from the transport model, and how this will be presented in ConnectMore have been shared to gain feedback to influence the development process. To date, workshops have been completed with:</p> <ul style="list-style-type: none"> • Liberty Charge • Franklin Energy • Ubitricity • Gridserve • Open Newtown • Liverpool City Council • Warrington Borough Council • Welsh Authorities • Knowsley Council/CPO <p>Holding these sessions 1:1 allows prospective users of the tool to give more detailed information on their site selection process and allows for more in-depth feedback collection, compared to that obtained in open forum.</p>

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

Workshop Title	Host	Date	Description
SPM Low Carbon Connections Conference	SP Energy Networks	March 2020	This event was cancelled at late notice due to the COVID lockdowns however registered participants received the presentation and an opportunity to provide comments.
Training Session for SP Energy Networks new EV Transport Capacity Maps	SP Energy Networks	May 2020	SP Energy Networks held a training session for users of new EV Transport Capacity Maps. These maps were prepared using PTV data alongside SP Energy Networks primary substation location and available capacity. This provided valuable early feedback to influence the design of ConnectMore.
Optimise Prime / Charge Project team update webinar	UKPN	April 2020	Stakeholder webinar to provide an update on learning across both projects.
Transport Practitioners' Meeting (Online)	PTRC / Industry conference	September 2020	Presentation on the Charge EV Uptake Scenarios and modelling methods
European Transport Conference (Online)	AET / Industry conference	September 2020	Presentation on modelling approach of Charge transport model
SPM Low Carbon Connections Conference Preparing for EV and Heat	SP Energy Networks	September 2020	Project team hosted breakout session, discussing recruitment for trial sites, describing the transport model and demoing the development version of the ConnectMore heatmaps
Modelling World (Online)	PTV/Industry conference	October 2020	EA Technology presentation to a transport modelling conference. The session highlighted the developing need for the integration of transport and electricity network planning and showcased ConnectMore.
Cenex-LCV 2020	Cenex	November 2020	A joint webinar with Optimise Prime to update stakeholder on progress with both EV projects followed by an audience Q&A.
SPM Low Carbon Connections Conference	SP Energy Networks	December 2020	SP Energy Networks provided connections customers with an update on the progress with the project.
Our EV uptake journey: Charge	ENIC	December 2020	A short update alongside other SP Energy Networks innovation projects followed by a Q&A. SP Energy Networks also hosted a virtual stand.



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 SP Energy Networks 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 Northern PowerGrid AutoDesign and Western Power Distribution 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 risks areas (technical, commercial and financial) and are set out in **Error! Reference source not found.** tables below.

The most pertinent risks to the project at the time of writing have been identified as:

Low customer utilisation of the ConnectMore tool – The success of the tool and the Charge project depends on its utilisation by 3rd parties / stakeholders. If they do not find value from ConnectMore, then the expected benefits of the project will not be met. Stakeholders have been involved in the design of ConnectMore from inception. The tool has been designed to meet their requirements, not those of SP Energy Networks or any of the other project partners. This Stakeholder Engagement has and will continue throughout the delivery of the ConnectMore tool, with increased focus in 2021 approaching the first release of the Interactive Maps. This engagement will ensure that our stakeholders are aware of its existence, it provides value to them, they feel supported when using the tool and their feedback is acted upon.

Low level of participation / candidate sites for SCC trials and loss of participants – In 2020 these two risks have increased in prominence because of the COVID pandemic. Several candidate workplace and retail location SCC trial sites were lost as a result of the uncertainty the pandemic has created. As far as possible, the ongoing impact of the COVID pandemic is being mitigated through the selection of trial sites in 2021. Ultimately, the decision by Stakeholders whether to progress with their involvement in the trials is a commercial decision that it is hard for the Charge Project to influence.

As covered in 2.1.5 a major recruitment drive has been undertaken towards the end of 2020 to provide a boost to the candidate sites to be considered for the 2021 trials. The focus of these trials is likely to focus on a smaller number of trial sites than originally envisaged by the project team. The focus of the detailed trial design will be on the more complicated SCC schemes that require signalling between DNO and chargepoint owner systems. Consideration will be given to how SCC trials can also be demonstrated in a virtual / lab environment, if for any reason physical trials are ruled out.

Integration of ConnectMore with NAVI and SP Energy Networks IT Systems – A key enabler for the ConnectMore tool is the NAVI Platform developed by SP Energy Networks. NAVI is a data processing, cleansing and enrichment software platform, capable of combining data from multiple sources and exporting value added data sets to a range of tools. It was decided from the offset of Charge that NAVI would serve as the single source of network data for ConnectMore and as such the tool has a very high dependency on the performance of NAVI.

Similarly, the successful delivery of ConnectMore Cost Estimation tool hinges on its ability to integrate with several corporate IT systems within SP Energy Networks. In many cases this will be the first time these systems have been asked to integrate with a third-party platform. The system integration will require a high level of due diligence and development time to ensure this is done securely and that data protection is maintained.

To mitigate both these risks, the Charge project team has established a close working relationship with the SP Energy Networks IT Team and the NAVI Delivery Team. In early 2021, dedicated resources will be in place to oversee the integration of the ConnectMore tool with SP Energy Networks systems.



Meshed Network Assessments – Significant portions of the LV network in the SP Manweb licence area are run meshed. This means that customers are fed from LV cables that feed from multiple substations / transformers. Whilst this provides performance and security benefits, it creates a significant challenge for network studies. Traditional load flow tools for LV networks are mathematically unable to analyse meshed networks. The successful delivery of the ConnectMore tool requires EA Technology to overcome this issue and find a suitable solution.

To overcome this challenge EA Technology are considering the use of two separate load flow assessment tools and potentially combining them both to achieve the required analysis. The SP Energy Networks Lead Engineer will be directly involved in the development and the validation of the solution to ensure effective and assured delivery.

Once this challenge is overcome, the ConnectMore tool should be capable of analysing every configuration of LV network in the UK.



Table 6: Technical Project Risk

Risk No.	Issue	Risk Description	Potential Impact	Control & Contingency Measures	Overall Risk (2-40)
1.0 Technical Project Risks					
3.02	Integration with SP Energy Networks IT Systems and reliance on NAVI	The proposed ConnectMore IT integration plan is reliant on 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 BaU	1. EA Technology IT team to work closely with SUK and NAVI team from early in the project 2. Reliance on NAVI to be factored into the business' support for adoption / delivery of Charge BaU	15
2.05	Engagement of Chargepoint Operators	The successful delivery of the Limited and Broader Trials will be dependent on the involvement of CPOs and the ability to find a suitable solution to enable the remote control of chargers. The CPO not necessarily being the Chargepoint Owner.	Inability to progress with trial sites and limited delivery of solutions and project learning	1. Enter a MoU with Chargepoint Owner to ensure their support prior to engaging CPO, 2. Early engagement with CPO to identify technical limitations / options, 3. Ongoing engagement with CPO and Owner during solution design	15
3.12	Meshed Network Assessments	The SP Manweb network largely comprises of meshed / interconnected networks at LV and HV. Traditional load flow tools utilised for LV networks are unable to undertake assessments of this type of network	1 Delays to launch of ConnectMore tool 2 Inability of ConnectMore tool to provide budget quotes / network capacity for stakeholders 3 Low utilisation of ConnectMore 4 Requirement to undertake further work to deliver a solution	1. EA Technology to consider utilisation of a number of LV load flow tools to ensure meshed networks can be assessed, 2. Recruitment of SP Energy Networks Lead Engineer to assist with understanding of the network	12



2.18	Adoption of Cloud DERMS	The decision to move towards a Cloud based DERMS platform provides the project with significant benefits but also presents some risks. The timescale to develop, approve and deploy a first of its kind Cloud DERMS solution is shorter than originally envisaged. It will limit SCC trials to physical trials at LV only, the risk being the trials low relevance to the solution being offered at HV and above.	<ul style="list-style-type: none"> 1 Delays to trials 2 Limited delivery of BaU ready solutions for HV and above 3 Reputational impact if HV sites need to be omitted 	<ul style="list-style-type: none"> 1. Provision of a dedicated UK IT resource to facilitate approval in 2021, 2. Delivery of draft FDS for HV solutions without necessarily undertaking a physical trial 	12
2.60	Chargepoints unsuitable for SCC trials	Upon undertaking detailed design of trials, it becomes apparent that the hardware chosen by the partner is unsuitable for the SCC trial	<ul style="list-style-type: none"> 1 Reduced number of trial sites 2 Delays to trials 3 Reputational impact 4 Increased expenditure 	<ul style="list-style-type: none"> 1.SP Energy Networks 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



Table 7 Commercial Project Risk

Risk No.	Issue	Risk Description	Potential Impact	Control & Contingency Measures	Overall Risk (2-40)
3.0 Commercial Project Risks					
2.21	Loss of trial participants	Trial location stakeholders withdraw, and the potential trial locations are lost, particularly in light on ongoing COVID restrictions	Inability to carry on with proposed trial site resulting in lost learning and inability to deliver learning outputs	1. Entering a MoU with all trial participants, 2. Undertaking an initial assessment of the technical suitability of the site for adopting an SCC, 3. Concentration on trial sites with secured funding, planning permission and a connection secured, and low probability of being impacted by COVID restrictions, 4. Inclusion of SP Energy Networks Depot / Workplace charging sites for trial, 5. Consideration to Virtual Demonstrations in lab environment	20
2.30	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 early 2021	1 Further delay to trials 2 Limited scope for new learning / outputs	1. Final large recruitment push in late 2020, 2. Utilisation of SP Energy Networks Depot / Workplace charging sites for trials, 3. Demonstration of multiple SCCs at individual sites, 4. Consideration to Virtual Demonstrations in lab environment, 5. Concentration on developing the SCC trials on the DNO led solutions only, whilst supporting customers to develop/deliver their own Customer Load Management / Timed Capacity Connection schemes.	15
2.10	Trial Site Utilisation	Low utilisation of trial site chargepoints by EV drivers - Increased since onset of COVID restrictions	1. Limited learning to provide statistically representative conclusions, 2. Inability to deliver outputs / learning	1. Selection of sites with dedicated EV users - Public carparks, depots / workplaces unaffected by COVID, 2. Consideration to incentivising charging, 3. Recruitment of EV drivers for testing the SCC on designated days	15



3.01	Low customer utilisation of ConnectMore tool	Third parties and/or key stakeholders do not find the ConnectMore tool useful or interesting	Full Method 3 benefits cannot be realised and ultimately ConnectMore shelved for an alternative	<ol style="list-style-type: none"> 1. Creation of stakeholder panel to review direction and outputs of project 2. Discussion on creating Charge specific stakeholder list for dedicated webinars and updates 3. Ongoing engagement with future tools users during the tool's development 	10
1.1	Knowledge	Knowledge import from other projects	Insufficient sharing of knowledge between this project and other projects happening in the EV sphere	<ol style="list-style-type: none"> 1.SP Energy Networks 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 	10
3.13	Third party tool integration challenges	Commercial and technical difficulty of integrating with a third-party load HV flow engine and the ongoing support requirements.	<ol style="list-style-type: none"> 1. Integration takes more time than allocated causing delays in ConnectMore development, 2. Reliability of service delivered by ConnectMore could be compromised as it is partly outside the control of project partners and reliant on third party provider, 3. Additional licence and support costs for commercial load flow model integration 	<ol style="list-style-type: none"> 1. As IPSA is the preferred HV load flow modelling tool/engine for SP Manweb. TNEI are releasing a cloud-based version in January and the project team has been in contact with TNEI to discuss our needs ahead of placing a purchase order for this version. 2. OpenDSS is open source and could act as default system 	10



1.04	Validity of Model	The Transport Model will be built on a 2018 Base Year and using EV-Uptake scenarios devised in 2020. Any radical changes to the transport network or EV-Up will impact the validity of the model and its findings	1. Reduced value of model to SP Energy Networks and Customers 2. Poor customer satisfaction if not kept up to date	Periodic review of: 1. the major changes to transport infrastructure / developments 2. EV uptake statistics 3. Revisions to DFES 4. Options to refresh model	8
3.7	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. 2. The costs of the connection will not be affected, the price that can be charged to the customer may change therefore the initial development of the ConnectMore EVCP connections cost estimator is focused on calculating the cost of the connection.	6
4.02	Car club	Available	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.	5
3.12	Supplier lock-in	Single provider of ConnectMore software	1 Cost increase outside the control of SP Energy Networks 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	4



3.10	Project Partners	Delivery issues due to collaboration of new project partners	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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 	4
4.7	Project Partners	COVID impacts on business/staffing levels may affect timely/quality delivery.	<ol style="list-style-type: none"> 1. Delays in project deliverables. 2. Project deliverables not able to meet all initial criteria. 	<ol style="list-style-type: none"> 1. Project partners and team members are following government guidelines. 	4
4.4	Project dissemination	Dissemination activity/events run by project partners do not provide value for money	<ol style="list-style-type: none"> 1 Reduces the overall impact of the project and prevents the expansion of the learning to additional Licence Areas 	<ol style="list-style-type: none"> 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. Energy Network Innovation Conference to ensure wide stakeholder involvement 	3
4.8	Project dissemination	Inability to perform face-to-face events may reduce coverage /dissemination. COVID news and communications may dilute project message.	<ol style="list-style-type: none"> 1. Reduces the overall impact of the project and prevents the expansion of the learning to additional Licence Areas 	<ol style="list-style-type: none"> 1. Conduct online dissemination events, live and recorded webinars (- could increase reach due to increased accessibility of events.) 2. Publish articles and establish social media presence. 	2

Table 8 Financial Project Risk

Risk No.	Issue	Risk Description	Potential Impact	Control & Contingency Measures	Overall Risk (2-40)
3.0 Financial Project Risks					
2.22	Unknown costs	IT Charge requires significant development of IT solutions to integrate ConnectMore with corporate systems as well as the approval and delivery of a Cloud DERMS platform. The IT budget allocated was built on a high-level assumption of these costs	Exceedance of project budget and risk of halting aspects of the trials / project	1. Modular aspect of trials reduces overall risk. 2. Extensive experience within the project team in delivering innovation projects and trials, 3. Project partners have a strong history delivering similar trials in the UK	10



11. Data Access Details

When data becomes available for this project interested parties can request it by following the guidance in the SP Energy Networks Data Sharing policy. The following link to this policy also contains further details about the data sharing process, https://www.spergynetworks.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