WPD INNOVATION

Electric Nation PoweredUp

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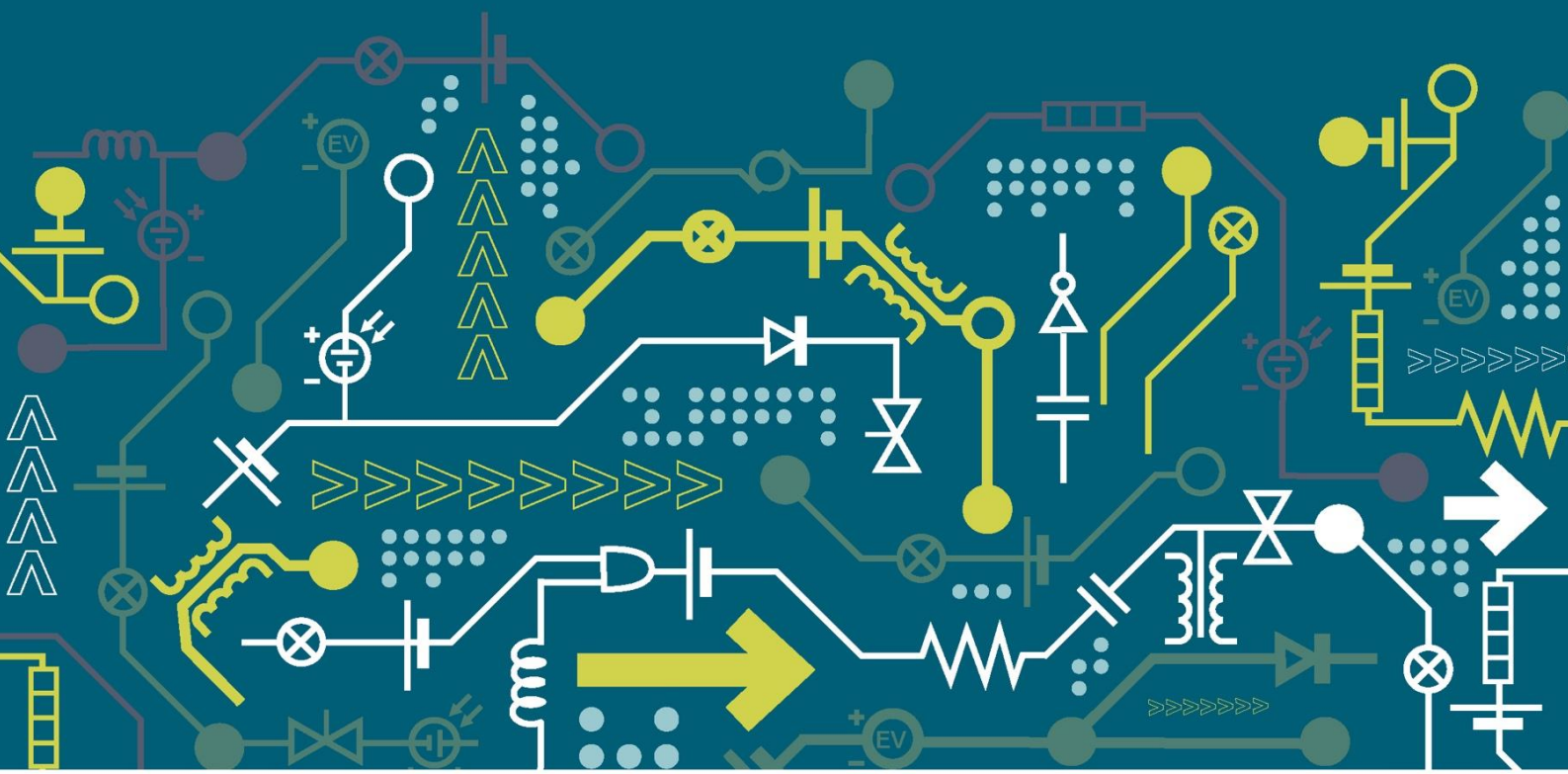
NIA Major Progress 6 Monthly Report

Reporting Period: January – March 2020



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Contents

1 Executive Summary

Electric Nation PoweredUp is funded through OFGEM's Network Innovation Allowance (NIA), and commenced in January 2020, and due to complete July 2022. Electric Nation PoweredUp is the official name of the project, with 'Electric Nation Vehicle to Grid' the customer facing name.

PoweredUp aims to enable us to understand how future bi-directional charging of electric vehicles might affect the operation of low voltage networks. The technical characteristics of this process are relatively untested due to the low volume of devices to date. Moreover, most of these devices until recently where installed in commercial premises with 3 phase connections. PoweredUp will examine the effect of up to 110 mainly domestic installations not only for technical characteristics but also for the likely usage by users and the energy supply services they access. To date projects relating to Vehicle to Grid (V2G) have examined a single energy management strategy whereas PoweredUp will examining a "future world" where a street of Electric Vehicle (EV) users may have these devices charging their cars orchestrated to varying strategies relating to the commercial goals of associated energy suppliers. This examination will result in recommendations for the parameters to be used in network planning.

An additional result of this examination the project will also produce recommendations regarding the possible use of V2G to support low voltage networks and how this might be organised commercially along with policy recommendations

As the new era of smart services emerges, we will need to protect LV networks where a wide range of energy services companies are independently optimising domestic energy resources to meet their particular objectives, and those of their end-user.

The Electric Nation PoweredUp Project intends to offer up to five energy services companies the opportunity to manage and optimise their own diverse business models across 20 V2G units each. This proposal of bi-directional services with up to 5 energy suppliers provides a much greater use of energy flow of the stored energy within the vehicle battery which we can potentially utilise to support the LV network during times of peak demand.

This report details progress of the project, focusing on the first 3 months of the project period, from January to March 2020.

PoweredUp remains in its design/set-up phase during the first 3 months due to the delay of the official project launch of recruitment of the 26th March 2020 as a result of the Covid-19 outbreak. The wider implications on the project of Covid-19 are reviewed on a daily basis by CrowdCharge and WPD; a new date to launch the project and officially start public recruitment will be rescheduled in the coming weeks.

Despite these delays affecting the recruitment launch and charger installations, with the latter delayed by 2-months initially, other aspects of project work remain unaffected as the full project team are working remotely. Project policies/procedures such as the data protection strategy have been completed, along with the customer engagement and recruitment plan. The end-user customer proposition has been created, offering participants the use of a free V2G charger which RRP for £5,500 for the duration of the trial, with the option to transfer ownership at the

conclusion of the trial in March 2022 for £250. A minimum incentive will be paid of the value of £10 assuming the participant meets the participation parameters; additional incentives are anticipated to be provided by 3-5 onboarded energy suppliers.

Upon the return of the Expression of Interest Form which was issued to all UK energy suppliers, CrowdCharge are in conversations with 7 UK Energy Suppliers, with 3 indicating that they are very interested to participate and at the stage of reviewing draft contracts with CrowdCharge to officially partner with the project to provide bidirectional energy services.

V2G charger hardware is continued to be tested by the CrowdCharge technical team; both the preferred Wallbox Quasar V2G unit and the Indra unit are undergoing pilot testing to establish robustness, usability, and technical capabilities for use in the Project. Installer procurement is ongoing and will be secured imminently.

1.1 Business Case

Whilst at an early stage of the project, the need to understand the nature of V2G EV charging services remains paramount; and as anticipated following more aggressive EU targets on automotive manufacturers for CO2 emissions of new vehicles registered, we have seen a tripling of the number of fully electric vehicles registered from Jan-March 2020 compared with 2019; despite a curtailing of deliveries during March due to the COVID-19 outbreak. 4.6% of new vehicles registered in March 2020 were fully electric (it was <1% in March 2019).

As electric vehicles scale upwards, it is anticipated that around 5,601 ground mounted transformers will be running between 100-110% capacity by 2030 (Taken from WPD's Network Assessment Tool), at a potential reinforcement cost of c£84M.

By 2030, around 25% of households will have a plug-in EV. On the vulnerable areas of the network identified for V2G assistance, 20% of the EV drivers would be recruited to provide local network support on behalf of the DNO (and their local community).

Assuming approx. 75 households per ground mounted transformer (x5,601), this involves supporting 420,075 households. It is estimated around one in four (105,019) would have an EV by 2030. To maintain safe network limits for these feeders, 20% of the EV chargers would be contracted by the DSO or their energy supplier to provide V2G balancing. The cost to provide the smart service (including compensating the driver) is estimated to be £15 per month (£180 p.a.). So, for the 5,601 areas, controlling 21K V2G chargers would cost £3.8M per annum, instead of an £84M one-off reinforcement investment.

1.2 Project Delivery Structure

1.2.1 Project Review Group

The Electric Nation Project Review Group meets on a bi-annual basis. The role of the Project Review Group is to:

- Ensure the project is aligned with organisational strategy;
- Ensure the project makes good use of assets;
- Assist with resolving strategic level issues and risks;

- Approve or reject changes to the project with a high impact on timelines and budget;
- Assess project progress and report on project to senior management and higher authorities;
- Provide advice and guidance on business issues facing the project;
- Use influence and authority to assist the project in achieving its outcomes;
- Review and approve final project deliverables; and
- Perform reviews at agreed stage boundaries.

The first Project Review Group meeting will be held on 11th of June 2020.

1.2.2 Project Resource

Western Power Distribution (WPD)

Project Manager: Ricky Duke

Project Buddy: Sam Rossi-Ashton

Marketing, Data and Legal Provisions as required.

Crowd Charge (CC)
Crowd Charge's primary roles in the project are:

- Project management – delivery of project;
    - Maintaining the project RAID log, Action Log and Key Outputs and Milestones log, alongside EATL and DE;
    - Monthly meeting coordination and reporting;
    - Monthly and 6 monthly reporting to WPD;
    - Escalation of significant issues to WPD;
- Management of project supporting activities, such as marketing and, PR for customer recruitment;
- Development of the end-user customer trial;
    - Recruitment and management of the 3-5 Energy Suppliers/Aggregators and their input to the end-user trial period;
    - Development of the required algorithms and integration to the CrowdCharge demand management digital platform;
    - All practical aspects of operating the customer trial;
- Production and dissemination of the project deliverables, reports, and learning outcomes.
- Recruitment of customer trial volunteers;
- Customer relationship management (including data protection);
- Supply and installation of V2G chargers, through sub-contractor organisations i.e. Installers;
- Customer communications and retention in the trial;
- Customer enquiry support and technical support via Project Support Line

EA Technology (EATL)
EA Technology's primary roles in the project are:

- Modelling of network impact for future scenarios
- Support engagement with energy suppliers and aggregators
- Support development of policy recommendations during the project's dissemination stage.

1.3 Procurement

Table 1 – Procurement during PoweredUp

Provider	Services/goods	Area of project applicable to	Anticipated delivery dates
CrowdCharge	Project delivery lead V2G integration & deployment Engagement, support	All stages	Jan 2020 – July 2022
Wallbox	V2G Chargers (1st choice)	Test System Pilot Installations Customer Trial	Jan 2020 – July 2022
Indra	V2G Chargers (2nd choice)	Back up V2G supplier	Jan 2020 – July 2022
Nichicon	V2G Chargers	V2G hardware for emergency response backup work package	Apr 2020 – July 2022
Hangar 19	Systems Integration (smart charger communications) equipment, services, and technical support	Test System Pilot Installations Customer Trial	Jan 2020 – July 2022
Installation companies currently being selected	V2G Charger Installation services & on-site technical assistance	Pilot Installations and Customer Trial	June 2020 – Feb 2022
3-5 Energy Suppliers/Aggregators	Provide bi-directional energy services for CC algorithm demand management platform	Pilot trial and Customer Trial	January 2021-March 2022
AutomotiveComms	Marketing & PR services	Project	Jan 2020 – July 2022
LEVL Telematics	Installer of Geotab Vehicle Telematics	Potential vehicle telematics provider (other direct options also being explored)	Jul 2020 – Jul 2022

1.4 Project Risks

A proactive approach is taken to ensure effective risk management for the PoweredUp | Electric Nation project. A RAID (Risks, Assumptions, Issues, and Dependencies) log is maintained, examined, and updated by CrowdCharge and WPD on a monthly basis during the review meeting. This activity ensures that risks are frequently reviewed, examining; whether risks still exist, whether new risks have arisen, whether the likelihood and impact of risks have changed, for reporting of significant changes that will affect risk priorities, and to deliver assurance of the effectiveness of control. Risks are reported to WPD within each monthly report.

1.5 Project Learning and Dissemination

A Project Learning Log is maintained. Project lessons learned and what worked well are captured throughout the project lifecycle. These are captured through a series of on-going reviews with stakeholders and project team members and will be shared in lessons learned workshops at the end of the project.

Due to the outbreak of Covid-19, dissemination activities have been postponed until further notice. The team planned to attend relevant industry events to raise the profile of the Electric Nation PoweredUp project and to share early learning arising from the customer trial:

- Events and touch points currently under review subject to COVID-19 impacts, however, may include:
  - LCV 2020
  - Western Power Distribution's 'Balancing Act' event
  - Fully Charged Live
  - Low Carbon Network and Innovation conference (LCNI) 2020
  - Newsletter for participants

2 Project Manager's Report

2.1 Project Background

This project will study the real-world effects of V2G charging on the LV network with smart bi-directional energy services provide by 3-5 UK Energy Suppliers/Aggregators and look to provide a smart solution to provide charging management to support the LV network at times of peak stress, and defer re-enforcement upgrades.

The project will:

- Understand and analyse how LV load profiles may change, and the level of variability this creates;
- Model the implications to LV network infrastructure of multiple co-existing energy partners;
- Inform the level of profile flexibility the DNO could access (user case envelopes);
- Simulate and test various DNO intervention models to determine the lowest cost, lowest impact option - including managing constraints dynamically or introducing a set of operating parameters;
- Recommend policy and commercial frameworks enabling market solutions to thrive whilst minimising DNO costs.

2.2 Project Progress

This report covers project progress for the period January 2020 to March 2020 (project started January so less than six months). The image below details the main work packages and their planned implementation, with time progressing downwards:

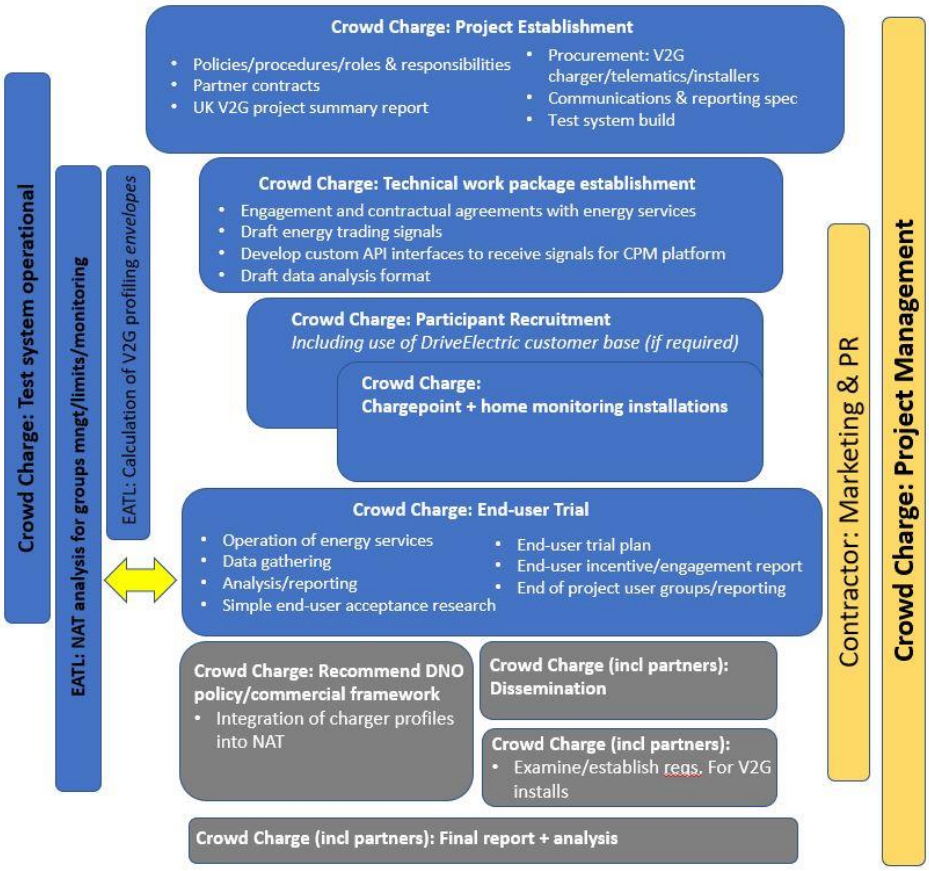

Figure 1 – Work Package and Project Structure

Key areas of the project plan work packages have progressed as follows:

2.2.1 Work Package 1 – Project Establishment and Management

This work package includes the initial set up/design phase of the project. This includes the establishment of project management systems and structures, such as the RAID log, Action Log, Key Outputs and Milestone (KOM) log, and the learning log. During this stage, all preparation and detailed planning for execution of the project took place. This includes assigning roles/responsibilities and the creation of policies/procedures, such as the recruitment and engagement plan and data protection strategy. Project reporting formats were established as well as procurement of V2G hardware for testing, and charger installation partners. In addition to above structures recruitment eligibility criteria, the end-user customer offering, the customer communications database, customer relationship management (CRM) database, help desk set-up and the associated process have been created and are ready for project recruitment launch.

A summary report of other UK V2G studies has been completed and used to focus the project end-user customer offering, in relation to other competitors V2G projects.

2.2.2 Work Package 2 – Technical Work Package

Key to this work package was the engagement with a selection of energy suppliers who will be providing the energy buying and export signals delivered to the V2G chargers. Included in this engagement is the establishment of the energy management strategies and an agreement for the purpose of the trial, with an amended schedule attached to allow for the project energy supplier deliverables to be amended as and how the project trial is foreseen to develop. Once engaged, the energy suppliers will be consulted to develop the method of delivery for energy signals, most likely via an API to the CrowdCharge platform. The core objective of providing data and visibility of V2G charging at aggregated level and testing of mitigation strategies that might be used by UK DNO's is also contained in this work package.

CrowdCharge platform customisation and integration of the selected V2G charger hardware has also conducted within this work package and. The Wallbox Quasar V2G charger is CrowdCharge preferred V2G charger offering due to both its aesthetic appeal to customers and its simpler logistics in terms of installations and fault fixing due to the small size of the unit. A second back-up unit, Indra, is also being testing by the CrowdCharge technical team in the instance that the preferred charger is not viable.

2.2.3 Work Package 3 – Participant Recruitment and V2G Hardware installations

To enable the start of the end-user trial, up to 110 electric vehicle users will be recruited to take part using the charging equipment in their homes. The marketing and communications activities required along with qualification and advising of potential participants is contained in this work package. Once recruited the arrangement for installation of V2G equipment will require training of installation contractors to ensure the units perform properly especially regarding communications. As part of this work package EATL will agree the scope and specification of data required to extend the functionality of their Network Assessment Tool (NAT) to include V2G chargers.

Installer and charger commission process training will take place in this work package to help increase the connection to the CrowdCharge platform from the installation day, and also to provide the highest level of customer service as the installers are a representation of CrowdCharge and WPD.

2.2.4 Work Package 4 – End-user Trial

The main trial will start in March 2021 and will test the deployment of energy supplier's electricity trading signals in real time with the end users. This part of the trial will look to emulate a future world in which energy suppliers are offering sophisticated end user tariffs and energy services that extract the value delivered due to availability of flexibility from these units and the participant behaviour. The trial will result in a data set along with testing of simulated DNO mitigation strategies to evaluate how this technology can be accommodated in UK networks in the future. Key to this mitigation is the provision of network limits (likely to be "envelopes") generated via the NAT tool. These limits will then be used to disaggregate the overall limit to individual chargers by the CrowdCharge platform while working in concert with the energy suppliers' strategies. A key outcome of the trial is to study where these objectives may be in conflict. To achieve this a trial plan will be developed with both individual energy suppliers and at an aggregated (simulated DNO) level. Of course the acceptance of customers to this type of service is important however, the assumption is made that customer acceptance relies on delivery of the required state of charge in their vehicle when they want to use it as examined in the original Electric Nation project. Customer attitude will be monitored but at a higher level and more frequently to enable steering of the charging strategies if required. This will also include a project review with end users in group format as well as individual questionnaire.

2.2.5 Work Package 5 – Final Analysis and Reporting

Trial data will be used to provide insight for DNO's and the energy industry at large regarding V2G. This analysis will evaluate the likely effect of V2G charging on network resilience and also provide mitigation strategies for the future. To provide effective utilisation of this analysis, policy recommendations will be made to help inform OFGEM and other regulatory bodies how this equipment should be used for the good of the whole energy system. This may include technical characteristics such as earthing and charging equipment standards along with protocols to manage the objectives of suppliers, DNO's and other energy sector actors. A key output will be a usable definition of the impact of a domestic V2G charger for use in network planning. This will not only steer the approval and installation process but also look to recommend what allowances planners should use for V2G chargers in the same way that Electric Nation helped to inform the after diversity max demand rating for home EV chargers.

2.3 Project Set-up

Key project personnel appointed, and resources committed, project meetings scheduled. Document management system established.

2.3.1 Review & Summary of other UK V2G Projects

Report produced and sent to WPD outlining the current state of play for V2G hardware, services, and projects. Since this report was produced, we have some evidence that the only V2G project that may be competing for participants in the WPD area (led by Ovo/Indra) may be close to closing their engagement process, which will further improve our ability to recruit over the coming months.

2.3.2 Project policies/procedures established

Policies and procedures documented and shared on the Projects SharePoint are accessible by CrowdCharge and WPD. These include the Project Management Documentation: the RAID log, IP register, project activity Gantt chart, invoicing schedule, the Key Outputs and Milestones (KOM) log; these are reviewed collaboratively on a monthly basis by the Project team. Furthermore, the project Data Protection Strategy and the Customer Communication and Recruitment Plan have been created and approved by WPD.

2.3.3 Training

The Customer Engagement Executive and Marketing Manager were appointed during March and February respectively, and have both received in-depth training regarding EVs, charging, electricity, networks and learning from other relevant projects including the original Electric Nation project and my Electric Avenue. Other members of the team were involved with the original project.

2.3.4 Business requirements workshop

The business requirements workshop was held at WPD's Bristol office on 10th March 2020 to understand internal stakeholders' requirements for the project and also to gain a wider understanding of useful objects for the project. This covered 2 main areas as detailed below in 2.3.4.1 and 2.3.4.1.

2.3.4.1 V2G and V1G in the planning process

CrowdCharge and WPD discussed and understood more thoroughly how network planning uses WPD's network mapping data to decide on specific additions to the network. There was a discussion about the nature of information or parameters required to evaluate the effect of V2G devices and that the characteristics are likely to be expressed in the form of an "operating envelope" rather than a simple ADMD rating. It was also understood that simply shifting load in time to avoid aggregated peaks may also lead to a need to downrate cable life expectancy as the cycle of electricity delivery has an effect on the average temperature of the cables i.e. more time spent dealing with higher loads degrades the cable and equipment at a different rate to the historical "duck curve" cycle.

2.3.4.2 Application and Approval process for V2G chargers

The proposed 7 KW single phase chargers, which are most likely to be popular in domestic installations, currently fall under the G99 policy due to current limit being over 16 amps per phase. This process is more stringent and designed for larger generating assets. A key difference for this process is that charging equipment is approved for use rather than notified

after installation. To date WPD's planners have been involved in a small number of applications mainly from OVO's innovate UK project. As these chargers are not type approved and do not show on the ENA portal as such the process requires a lot more work. In reality most of these chargers have been installed with export limited to 16 amps as this falls under G83 which is a 'connect and notify' process. G99 has then been applied for subsequently. For the PoweredUp project it is planned that charging equipment will be type approved to ensure applications are approved before installation. The engineering staff have offered to give a tutorial on high level examination of online digital network mapping data to enable CrowdCharge to triage applications and exclude those that are very likely not to succeed. It was also agreed that the project will provide useful feedback to possibly streamline the application and planning process in future.

2.3.5 Project Plan

The project plan has been regularly reviewed, and in light of the COVID-19 lockdown – CrowdCharge and WPD are engaged in daily 12 noon update calls. It was agreed between the parties to delay start dates for pilot installations and project installation dates by two months, however as things stand the intention is to retain all other key dates including the operational trial start date (March 2021). The situation will be regularly reviewed as the Covid-19 situation develops in the coming months.

Category	Detail	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20
Commerical Engagement	Engaging and securing energy partner commitn						
Commerical Engagement	Contracts with energy partners						
Commerical Engagement	Technical specification						
Commerical Engagement	Algorithm approval with Nissan						
Equipment & Installations	Controller units/intergration						
Technical	Ongoing charger intergrations						
Equipment & Installations	SIM & comms integration						
Equipment & Installations	Installation (MileSt: Start/End)				MileSt		
Equipment & Installations	Installation planning & coordination						
Equipment & Installations	Shipment & logistics inc. insurance						
Equipment & Installations	Telematics coordination						
Equipment & Installations	Test system vehicles (5 Nissan Leafs)						
Equipment & Installations	Home metering installations						
Technical	Customise energy partner system interface						
Technical	Charger platform customisation						
Tecnhical	Energy partner profiles implementation (scope						
Technical	App customisation						
Technical	Pilot site testing: MileSt set-up	MileSt					
Technical	Cloud data costs						
PM & Operations	Contractual agreements - Suppliers 1 & 2 & 3		MileSt				
Design	Supplier 1/2/3 - end-user test plan				MileSt		

Figure 2 – Project Plan and Task Timescales

2.3.5.1 Key areas for the next 6-months

Although the COVID-19 lockdown has put a temporary halt to the official launch of the Project and the start of the end-user customer recruitment phase, CrowdCharge are still able to focus on the following for the next 3 months:

- Securing the 3-5 UK Energy Suppliers
    - Contractual agreement for them to be onboarded to the Project.

    - Begin to discuss energy trading strategies and technical requirements for the CrowdCharge demand management platform integration (if required).
- Pilot site testing
    - 1 unit is being tested in a localised manner
    - Once the Covid-19 lockdown restrictions are lifted, installation of a further 3 units in the field are required to understand its usability for the general public unfamiliar with this equipment.
- Charger Hardware testing
    - Continued hardware testing of Wallbox Quasar V2G and Indra V2G unit
    - Customisation of charger(s) API interface with CrowdCharge digital platform

- Customer recruitment launch
    - Once the Covid-19 situation begins to improve, commence recruitment and onboarding of participants to the project.
- Installation partners
    - Contract subcontractor agreements in place with 1-2 V2G charger point installers.
    - Create, design, and implement V2G charger home survey form/process for prospective participants.

2.3.6 Data Protection Strategy and policy

The project Data Protection documents have been created and approved, including the Data Protection Strategy, and the Golden Rules to be applied within the project. These have been circulated to all members of the project team within CrowdCharge, and will also be shared with other project partners i.e. onboard Energy Suppliers and EATL to ensure all partners in the project adhere to the correct management and transfer of data as specified in the Data Protection Strategy document.

2.3.7 Project Partner Contracts

A step-in plan has been documented and agreed.

It was decided that the contract with EA technology was best created once the likely data interface to their systems was better understood.

For the Energy Supplier involvement, a draft collaboration agreement is in the process of been created; this will have attached a schedule where the main body of work/supplier milestones will be detailed. This allows the schedule to be amended and re-agreed by both parties as the project and end-user customer trial develops.

2.3.8 Commercial Engagement Plan

The proposition for energy partners has been summarised both as a presentation, and also as part of an Expression of Interest (EOI) initiated by WPD to attract Energy Suppliers and Aggregators to the project. This has led to seven companies engaging in serious discussions about potential participation. The terms of involvement are now being finalised, as well as a supporting collaboration agreement which is in the process of being drafted.

2.3.9 Customer Support line

The telephone line for both customer enquiries and project support for onboard participants has been activated. Project emails address have also been created to handle customer enquiries and support for participants once part of the project. These are both accessible by 3 members of the project team from 08:30-18:00 Monday-Friday.

Any participant instance outside of these hours which require immediate attention are forward to the Project Director.

2.3.10 End-user recruitment launch

The team were ready to initiate the recruitment launch on the original planned date of 26th March 2020 as part of the Nottingham City Council Go Ultra Low City event, however this was postponed due to the Covid-19 outbreak. Following this, a digital only launch date was planned for April 2nd, however WPD feel it in light of the serious impact of COVID-19, it would be prudent to temporarily delay this and review later in April.

The recruitment preparation has been documented and circulated in detail (Quarterly Communications and Customer Engagement Report), and covers the website, press release, engagement channels, processes etc.

2.3.11 Marketing

A sub-contract has been established with Automotive Communications to develop website and other collateral including professional photography and copywriting through to PR and event management. This has proved to be valuable with early production delivered on time and to a high standard. Automotive Comms have been involved in previous OFGEM funded projects including *My Electric Avenue* and the original *Electric Nation* project.

CrowdCharge will be contacting c.500 contacts which have registered their interest in V2G chargers and/or services; this is anticipate generate a sizeable number of leads which can begin the project's recruitment phase in positive manner. Nissan Dealers are also expected to support the recruitment on the project; CrowdCharge discussions with Nissan UK are progressing and early indications lead us to expect official support of the project from the UK HQ marketing department and dealer network in the WPD areas.

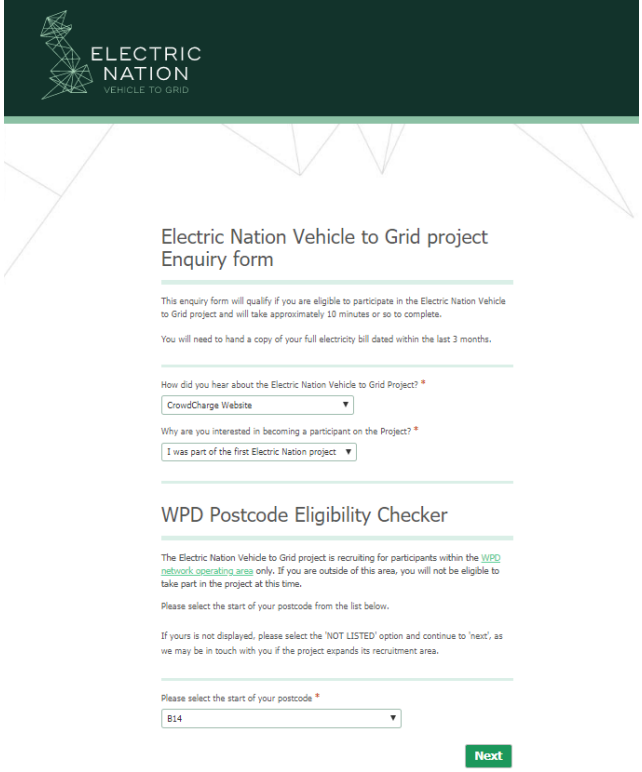

Figure 3 – Screenshot of Enquiry Form on Project Website

2.3.11.1 Website

The Electric Nation official website has been re-designed in preparation for the launch of the project, with a new, refreshed aesthetic to the site along with new images to be used for the duration of the trial to engage with prospective participants and visitors to the site. The website details information to be eligible for the trial, along with a comprehensive FAQ section to inform the visitors of all aspects of the trial this increasing customer communications.

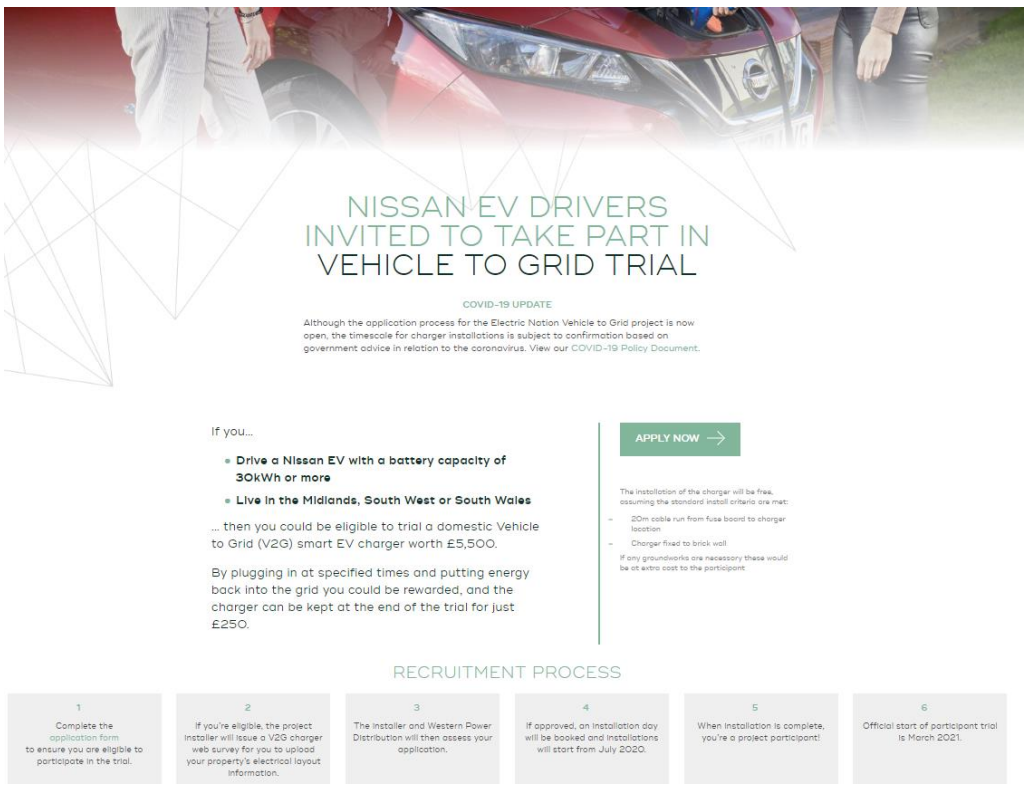

Figure 4 – New look Homepage on Project Website

Additionally, the website has an initial application form with pre-qualifies prospective participants to meet the project eligibility requirements e.g. WPD postcode, Nissan EV, off street parking etc. If the visitor passes this form or not, they are invited to input their personal details in the instance that the project eligibility parameters change and CrowdCharge are required to contact them. This form will record the number of submissions for project reporting purposes, and links with the CrowdCharge CRM system.

2.3.11.2 Press and PR Activity

Aside from appearing in the Smarter Networks Portal any further promotion has been held waiting for launch date so that all application processes are ready. Negotiation is in process for an exclusive article for The Times newspaper that arrived courtesy of WPD's PR agency Instinctif. If this goes ahead this would remain exclusive to The Times for an initial 2 weeks allowing the syndication of content by them. An initial press release has been prepared and ready to be distributed as per the Marketing and Comms strategy prepared by CrowdCharge, and to be shared as widely as possible on social channels.

2.3.12 Social Media

Social Media has not commenced as yet. Social media launch communications plan has been approved by WPD and the following Electric Nation branded channels have been set up; Twitter and Linkedin Group. We will also be looking to approach through the Nissan LEAF Facebook Owners Club as well as partner social channels.

2.3.13 Customer Relationship Management System (CRM)

The initial application form has been linked with the CrowdCharge Microsoft Dynamics Customer Relationship Management (CRM) through the specific data fields and are qualified by a team member assuming they pass the basic eligibility questions. Upon passing this stage they are issued with the Project Expression of Interest form which details the initial terms and conditions of the project to make them aware before progressing further in the process. Once this document has been digitally complete, then the first point of contact is made in the form of a qualification call to ensure the potential participant understands the project and fits the requirements. The status and journey can be tracked in the CRM and next steps enforced using manual and automated processes. Assuming they are happy to proceed, the customer will complete a V2G home charger web-survey and be issued a project Participant Agreement for their review and signature; at this point they are officially a participant on PoweredUp.

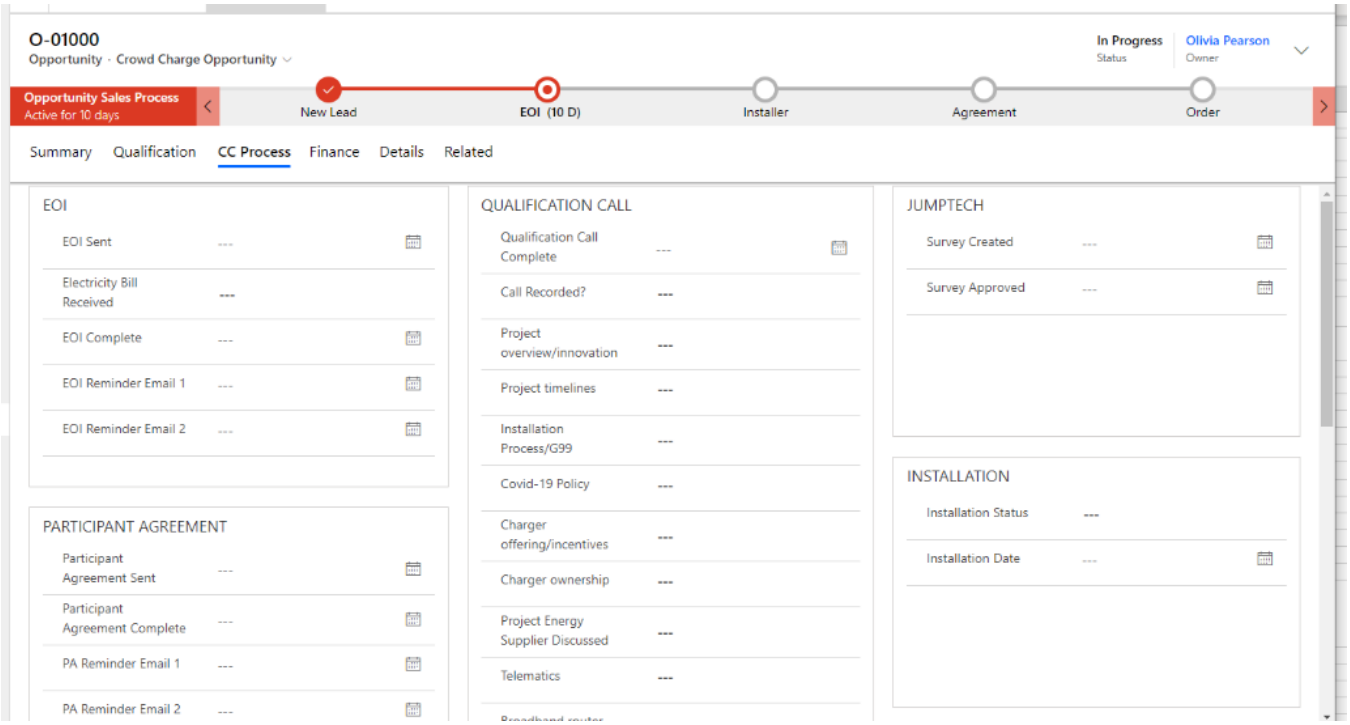

Figure 5 – Screenshot of the CRM System

2.3.14 Installer Procurement/Process

CrowdCharge are in conversations with two national charger point installers: The Phoenix Works, who were contracted by DriveElectric for installs on Electric Nation 1, and BMM Energy Solutions, who are a respected charger point installer of which DriveElectric have had a strong relationship with for one year.

Initial installation quotes for both the Wallbox Quasar unit and the Indra have been received and are undergoing review with the CrowdCharge technical department to ensure they correct hardware/equipment is to be used in line with the most up to date IET electrical and wiring regulations.

The process for completing prospective participants to complete a V2G charger home survey web-form is to be complete through an online portal. This portal will issue a text message asking them to uploading electrical information and home survey photos directly from their smart device; this allows for a smoother and more efficient process for both the prospective participant and installer to assess the status of their application for a 7kW bi-directional V2G charger. Via this platform, the installer will also complete the ENA's G99 connection form request and issue this to WPD central mailbox.

This digital platform has begun to be built for CrowdCharge and Electric Nation use in the PoweredUp project. The first pilot installation will use this platform to test before being released on the wider project participant cohort.

2.3.15 Energy Partner Procurement

During March, CrowdCharge issued an Expression of Interest form to all UK energy suppliers offering the opportunity to participate in the project, detailing the timeline, objectives, and basic requirements. In total, CrowdCharge are in conversation with 7 UK Energy Providers:

Flexitricity
Bulb Energy
Green Energy UK
EON
Centrica
Igloo Energy
F&S Energy

Introductory conversations have taken place with all partners, with the most promising and likely to contract with CrowdCharge being: Flexitricity (aggregator), Bulb Energy, and Green Energy. Centrica have also indicated they are very interested to participate in the trial, this representing one of the big six energy suppliers which is a desirable goal for the project. Draft contracts are being created and will be issued imminently to these 4 suppliers for further commercial and technical discussions on the energy services they intend to offer their cohort of 20-30 V2G charger end-users, and their incentive schemes.

3 Progress against Budget

Table 2 – Project Spend

Spend Area	Budget (£)	Expected Spend to Date (£)	Actual Spend to Date (£)	Variance to expected (£)	Variance to expected %
1. WPD PROJECT MANAGEMENT	£83,640	£11,412	£10,674	£738	-6.5%*
2. Total Crowd Charge Contract	£2,184,075	£533,950	£533,950	£0	0%
TOTAL	**£2,267,715**	**£545,362**	**£544,624**	**£738**	**-<0.1%**

* A small underspend has occurring during the start-up [phase due to attention required on other projects. However this final figure does not reflect time booked to the project in March, and would therefore reflect a figure closer to the expected spend.

4 Progress against success criteria

The following list has been taken from PoweredUp's Project Outline document which details the requirements for the project to be deemed a success. A progress update to each success criteria is detailed below:

The success of the Electric Nation V2G project will be predicated based of:

1) The delivery of the milestones, within the time, scope and cost parameters as detailed in the project's KOM log.

1.1 Update:

The first 3 milestones of the project which covered the period of January – March 2020 have been completed:

- MS-01 – "Project Mobilisation including the establishment of Project policies, procedures, reporting schedules, project Plan and review of current UK V2G projects" – 31/01/20
- MS-02 – "End-user recruitment start" – 01/03/20: Despite the temporary delay in the project recruitment launch, CrowdCharge have received dozens of WPD enquires to participate in the project. Furthermore, the list of c.500 enquiries for V2G charger and energy service CrowdCharge have included as recruitment start.
- MS-03 – "Business Requirements Workshop completed, Technical, Communication and Engagement report delivered to WPD" – 31/03/20

These milestones have been completed within time, scope, and the cost parameters budget as set in the projects budgeting tool.

2) Presentation of the final report data analysis and project's findings to WPD and key industry stakeholders at the dissemination event, held in the first quarter of 2022.

2.1 Update:

As the Project is currently in the setup/design phase, no final report data of analysis have been conducted or disseminated to key industry stakeholders.

3) Recommendations/suggestion to WPD's V2G services policy and commercial frameworks.

3.1 Update

The Business Requirements workshop took place on the 10th March 2020 in Avonbank, Bristol. This workshop included WPD District Planning staff and members of the WPD Planning Policy and Network Strategy teams. This initial workshop covered introductions on current planning/approval process for V2G chargers, G99 application process handled at present, and investigative conversations on what information/tools would make the approval decision easier/more efficient, among other policy planning policy and network strategy topics.

This success criteria is expected to be delivered towards the final stages of the project. This initial business requirements workshop information will contribute into delivering this project success criteria towards the conclusion of the project. Further business requirements workshop could be planned as the project develops to aid in completing this success criteria.

4) Specify and provide a standard data set that can be used by a network modelling tool to evaluate impact of V2G charging on LV networks.

3.1 Update

As the Project is currently in the setup/design phase, no charger data has been recorded or able to be analysed by the NAT tool. This success criteria is anticipated to be delivered in 2022, with more detailed updates provided in mid-late 2021.

5) Using a network modelling tool to provide a forecast of the effect of V2G charging at varying levels of uptake. This will be based on a mix of dynamic bidirectional energy services.

5.1 Update

As the Project is currently in the setup/design phase, no charger data has been recorded or able to be analysed by the NAT tool. This success criteria is anticipated to be delivered in 2022, with more detailed updates provided in mid-late 2021.

5 Learning Outcomes

The project has a learning log which is reviewed on a quarterly basis by the project team. Currently no learning logs entries have been made due to the project remaining in its design/set-up phase; however, CrowdCharge anticipates this to be populate in the coming weeks upon the project launch and recruitment start and technical conversation develop with the onboard Energy Suppliers.

This document is accessible in the Project Management Documentation shared folder between CrowdCharge and WPD.

6 Intellectual Property Rights

A complete list of all background IPR from all project partners has been compiled, main entries are from CrowdCharge regarding the IP surrounding the design and operational management of its charger demand management platform and associated patents.

No additional foreground IP entries have been made to the IPR register since its creation at the inception of the project in January 2020. The IP register is reviewed on a quarterly basis.

The PoweredUp IP register can be found in the Project Management Document folder within the shared folder between CrowdCharge and WPD.

7 Risk Management

Our risk management objectives are to:

- Ensure that risk management is clearly and consistently integrated into the project management activities and evidenced through the project documentation;
- Comply with WPD's risk management processes and any governance requirements as specified by OfGEM; and
- Anticipate and respond to changing project requirements.

These objectives will be achieved by:

- ✓ Defining the roles, responsibilities, and reporting lines within the Project Delivery Team for risk management;
- ✓ Including risk management issues when writing reports and considering decisions;
- ✓ Maintaining a risk register;
- ✓ Communicating risks and ensuring suitable training and supervision is provided;
- ✓ Preparing mitigation action plans;
- ✓ Preparing contingency action plans; and
- ✓ Monitoring and updating of risks and the risk controls.

7.1 Current Risks

The PoweredUp | Electric Nation risk register is a live document and is updated regularly. There are currently 29 live project related risks. Mitigation action plans are identified when raising a risk and the appropriate steps then taken to ensure risks do not become issues wherever possible. In **Error! Reference source not found.**, the details of the project's top five current risks, by category, are given. For each of these risks, a mitigation action plan has been identified and the progress of these are tracked and reported. These are taken from the 'EN PoweredUp – RAID Log' which is accessible in the Project Management documentation shared folder between CrowdCharge and WPD.

7.1.1 PoweredUp Raid Log Top 5 Risks

Table 3 - A snapshot of the risk register, detailed graphically, to provide an on-going understanding of the projects' risks.

Risk	Risk Rating	Mitigation Action Plan	Progress	Explanation for Risk Increase from Previous Month
R020 – Wallbox charger is not technically sound for use in the project	Severe	1) Initial testing of 1 unit to establish its functionality, robustness, and usability for trial controllability 2) Regular technical communications with Wallbox team 3) Target go-no-go decision by April whether this should be used as main hardware offering for customers. 4) Testing of Indra simultaneously to use as contingency 5) Nichicon charger to be used a last backup option	CrowdCharge technical team have received 2 Quasar units and have begun testing.	Initial Testing Quasar charger CrowdCharge received did not function as intend and required site visit from Wallbox HQ technical team.

Risk	Risk Rating	Mitigation Action Plan	Progress	Explanation for Risk Increase from Previous Month
RO25 - Coronavirus outbreak leading to Project Milestones/deliverables delayed from the original timeline	Severe	1) Remain in regular contact with suppliers to foresee delays in production/services/people resource and the effect on the project. 2) Daily update call with WPD re Covid19 outbreak.	In progress	Due to UK Government social distancing and lockdown.
RO28 – Coronavirus outbreak causes installer contractors unable to source electrical components such as RCDs, cabling etc, due to global shortage	Major	1) Ask installer to bulk order supply as soon as possible 2) Source alternative supplier of electrical components as required as fall back	In Progress	
R029 - Coronavirus outbreak causes a decrease in sales of Electric Vehicles - specifically Nissan Leaf/env200 sales fall	Major	DriveElectric to remain in close contact with the OEM industry to anticipate if this is likely to become an issue	In Progress	
R031 - Continuing outbreak of Coronavirus causing onboard participants to dropout due to the slowdown in economy/losing their jobs etc	Major	Clear communication with the participant on requirements and CrowdCharge Coronavirus policy at the start of the recruitment process	In Progress	

Table 4 – Total risks excluding COVID-19 specific

Likelihood = Probability x Proximity	1. Insignificant changes, re-planning may be required	2. Small Delay, small increased cost but absorbable	3. Delay, increased cost in excess of tolerance	4. Substantial Delay, key deliverables not met, significant increase in time/cost	5. Inability to deliver, business case/objective not viable
Certain/Imminent (21-25)	0	0	0	0	0
More likely to occur than not/Likely to be near future	0	0	0	2	0
50/50 chance of occurring/Mid to short term (11-15)	0	0	1	0	0
Less likely to occur/Mid to long term (6-10)	1	2	4	5	0
Very unlikely to occur/Far in the future (1-5)	4	4	4	2	0
	Impact				

	Minor	Moderate	Major	Severe	
Legend	15	6	6	2	**No of instances**
Total	29				No of live risks

7.1.2 Update for risks previously identified

Summary of all closed risks on project:
These risks relate to the RAID Log titled 'EN PoweredUp – RAID Log' which is accessible within the Project Management Documents shared folder.

RO19 – Closed – Rating 6
Wallbox require 100% upfront payment (bulk order payment terms unknown) which was not assumed by CrowdCharge on scoping of the invoicing scheduled.
Risk closed as Wallbox confirmed upfront payment of 30% required on order.

RO21 – Closed – Rating 18
Wallbox charger – API platform controllability integration cost of £50,000 is higher than budgeted
Risk closed as CrowdCharge negotiated a lower price in line with the budget.

7.2 PoweredUp Covid-19 Specific RAID Log

Due to the Covid-19 outbreak and unprecedented affect it has caused on general productivity of UK businesses, a PoweredUp project Covid-19 specific RAID log has been created to

identify associated project risk of the UK lockdown. This is reviewed on a daily basis to monitor the current risks and update the mitigating action plans, as the advice from the UK government develops. This is to be reviewed daily for the next 3-6 months.

Table 5 – Top 5 COVID-19 specific risks

Risk	Risk Rating	Mitigation Action Plan	Progress	Explanation for Risk Increase from Previous Month
5 pilot site installs will be delayed due to halt on works at customers' homes	Severe	This will be Mitigated through the change request procedure.	In progress	COVID-19 Outbreak
Halt on installations at customers' homes will delay the deliverable of customer installation begin & complete	Severe	This will be Mitigated through the change request procedure. There is also a small amount of buffer time built into this deliverable.	In progress	COVID-19 Outbreak
Recruitment takes longer than expected due to less appetite to be involved within general public	Severe	CC Comms are now targeting recruitment online, and will be including phases such as 'Business is open' to give potential applicants some comfort.	In progress	COVID-19 Outbreak
Reduced or delayed work output due balancing childcare and working from home.	Severe	Working hours may be adjusted to unsociable hours to work around childcare, or may ask project buddy for assistance on specific tasks.	In progress	COVID-19 Outbreak
Technical issues with the wallbox V2G chargers will take longer to resolve with engineers unable to travel from Portugal as done previously.	Major	If further technical assistance from Wallbox is required, this can either be delivered through video call etc. The project team also have the option to procure and use the Indra or Nichion unit if technical issues cannot be resolved.	In progress	COVID-19 Outbreak

Table 6 – Total COVID-19 Risks

Likelihood = Probability x Proximity						
	Certain/Imminent (21-25)	0	0	0	0	1
	More likely to occur than not/Likely to be near future (16-20)	0	0	1	2	1
	50/50 chance of occuring/Mid to short term (11-15)	0	0	0	3	0
	Less likely to occur/Mid to long term (6-10)	0	0	2	1	1
	Very unlikely to occur/Far in the future (1-5)	0	0	4	0	2
		1. Insignificant changes, re-planning may be required	2. Small Delay, small increased cost but absorbable	3. Delay, increased cost in excess of tolerance	4. Substantial Delay, key deliverables not met, significant increase in time/cost	5. Inability to deliver, business case/objective not viable
		Impact				

	Minor	Moderate	Major	Severe	
Legend	4	4	6	4	**No of instances**
Total	18				No of live risks

8 Consistency with Project Registration Document

The scale, cost and timeframe of the project has remained consistent with the registration document, a copy of which can be found here:

https://www.smarternetworks.org/project/wpd_nia_049

9 Accuracy Assurance Statement

This report has been written and compiled by the Project Director from CrowdCharge (Mike Potter) the Projects Operations Manager (Anthony Simpson) and the Project Manager (Adam Langford). The Project Manager from WPD (Ricky Duke) has contributed to this report by way of review. This report has been reviewed and approved by Western Power Distribution Innovation Manager Jon Berry.

All efforts have been made to ensure that the information contained within this report is accurate. WPD confirms that this report has been produced, reviewed, and approved following our quality assurance process for external documents and reports.

Glossary

Abbreviation	Term
API	Application Programming Interface
CRM	Customer Relationship Management (System)
DNO	Distribution Network Operator
DSO	Distribution System Operator
EOI	Expression of Interest
EV	Electric Vehicles
GDPR	General Data Protection Regulation
LCT	Low Carbon Technology
LV	Low Voltage
MPAN	Meter Point Administration Number
NIA	National Innovation Allowance
PR	Public Relations
PV	Photovoltaic
V2G	Vehicle to Grid
WPD	Western Power Distribution

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