NIC Project UKPNEN03

Project Progress Report

June 2020

Optimise Prime

HITACHI Inspire the Next · Uber · Scottish & Southern Electricity Networks · centrica · Royal Mail · UK Power Networks

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Table of acronyms

Acronym	Full form
ANM	Active Network Management
CAFE	Clean Air For Europe
CP	Charge Point
CPC	Charge Point Controller
CPO	Charge Point Operator
DNO	Distribution Network Operator
DSO	Distribution System Operator
EPN	Eastern Power Networks plc (one of UK Power Networks' three DNOs)
EV	Electric Vehicle
FSP	Full Submission Pro-forma
GB	Great Britain
GSA	Geospatial Analytics
IEA	International Energy Agency
IoT	Internet of Things
IP(R)	Intellectual Property (Rights)
IT	Information Technology
LCV	Light Commercial Vehicle
LPN	London Power Networks plc (one of UK Power Networks' three DNOs)
NIC	Network Innovation Competition
OEM	Original Equipment Manufacturer (in this context vehicle manufacturer)
OLEV	Office for Low Emission Vehicles
PHV	Private Hire Vehicle
PM	Project Manager
PPR	Project Progress Report
RAID	Risks, Assumptions, Issues and Dependencies
RMG	Royal Mail Group
SPN	South Eastern Power Networks plc (one of UK Power Networks' three DNOs)
SSEN	Scottish & Southern Electricity Networks
TCO	Total Cost of Ownership
TfL	Transport for London
UAT	User Acceptance Testing
UK	United Kingdom

Glossary of terms

Term	Definition
Trial A	The first phase of the WS2 depot trial implementation, involving seven depots and 220 vehicles.
Trial B	The second phase of the WS2 depot trial implementation, involving all remaining WS2 sites and vehicles.
Trial Period	A 12-month period of trialling for each workstream when all trial vehicles are on the road.
WS1	Workstream 1 – Trial 1 – Home Charging
WS2	Workstream 2 – Trial 2 – Depot Charging
WS3	Workstream 3 – Trial 3 – Mixed Charging
WS4	Workstream 4 – IoT Platform, Network Forecasting & Flexibility Analysis
WS5	Workstream 5 – Business Model
WS6	Workstream 6 – Reports and Documentation
WS7	Workstream 7 – Project Management and Sharing Learning

1 Executive summary

1.1 Project background

Optimise Prime is an industry-led electric vehicle (EV) innovation and demonstration project that brings together partners from leading technology, energy, transport and financing organisations, including Hitachi Vantara, UK Power Networks, Centrica, Royal Mail, Uber, Scottish & Southern Electricity Networks, Hitachi Europe and Hitachi Capital.

The project will gather data from up to 3,000 EVs driven for commercial purposes through three trials. Optimise Prime will also implement a range of technical and commercial solutions with the aim of accelerating the transition to electric for commercial fleet operators while helping GB's distribution networks plan and prepare for the mass adoption of EVs. Through cross-industry collaboration and co-creation, the project aims to ensure security of energy supply while saving money for electricity customers, helping the UK meet its clean air and climate change objectives.

This project aims to be the first of its kind, paving the way to the development of cost-effective strategies to minimise the impact of commercial EVs on the distribution network. Commercial EVs are defined as vehicles used for business purposes, including the transport of passengers and goods. Compared to vehicles used for domestic purposes, commercial EVs will have a much greater impact on the electricity network. The potential impact of commercial EVs charging at depots results from two factors: co-location of multiple EVs at a single depot location, and higher energy demand per vehicle resulting from higher daily mileages and payloads. The latter is also a factor when commercial EVs are charged at domestic locations.

This project will seek to answer three core questions relating to the electrification of commercial fleets and Private Hire Vehicles (PHVs):

1. How do we quantify and minimise the network impact of commercial EVs?
The project will gain a comprehensive and quantified understanding of the demand that commercial EVs will place on the network, and the variation between fleet and PHV types. The project will achieve this through large-scale field trials where significant volumes of vehicle and network data will be captured and analysed. This data will enable the creation and validation of practical models that can be used to better exploit existing network capacity, optimise investment and enable the electrification of fleets as quickly and cheaply as possible.

2. What is the value proposition for smart solutions for EV fleets and PHV operators?
The project will gain an understanding of the opportunities that exist to reduce the load on the network through the better use of data, planning tools and smart charging. Additionally, the project will consider and trial the business models that are necessary to enable these opportunities. The project will achieve this by developing technical and market solutions, and then using them in field trials to gather robust evidence and assess their effectiveness.

3. What infrastructure (network, charging and IT) is needed to enable the EV transition?
The project will develop an understanding of how best to optimise the utilisation of infrastructure to reduce the load on the network. This will be achieved through the collection, analysis and modelling of depot-based, return-to-home fleet and PHV journey data. By answering these questions, the project will enable network operators to quantify savings which can be achieved through reinforcement deferral and avoidance while facilitating the transition to low carbon transport. The trial will also assess the vehicles' journey data to understand the charging and associated IT infrastructure requirements and implications for depot and fleet managers to be able to operate a commercial EV fleet successfully.

1.2 Purpose of this document

This is the Second Project Progress Report for the Optimise Prime NIC project, covering the six-month period between 20 December 2019 and 19 June 2020. This document will, together with the next six-monthly report in December 2020, fulfil the reporting requirements of Sections 8.11 – 8.15 of v3.0 of the NIC Governance Document. This document aims to keep project stakeholders informed on the progress and lessons learned from the Optimise Prime project.

1.3 Summary of progress

Optimise Prime has continued to make progress towards delivering the three trials throughout the last six months. As discussed in the previous report, the project paused some development work in this period, until there is more certainty on the volume of vehicles that will participate in the WS1 and WS2 trials. The resolution of this issue is still in progress, therefore the development of the trials applications remains paused until more certainty is achieved in terms of meeting the minimum vehicle requirements. Optimise Prime notified Ofgem of a non-material change to the project on 20 February 2020; all outstanding deliverables will now be delayed 364 days as a result of the delay to the trials, however the project team will endeavour to deliver these earlier if possible.

The project has successfully:

- Installed the Charge Point Controllers (CPCs) for WS2 Trial A with all vehicles for this phase in use and being charged.
- Designed the approach to delivering profiled connections
- Completed the build phase of the profiled connection assessment add-on functionality to UK Power Networks' existing network planning tool
- Commenced analysis of data and execution of the trial experiments for WS3
- Loaded WS3 vehicle journey data onto the IT platform and begun analysis
- Developed a total cost of ownership model for validation during the trials
- Held joint webinar with the Charge project to disseminate learnings.

In addition, efforts to procure EVs for all Optimise Prime trials are ongoing:

- WS3 has continued to make good progress, with data from a significant number of EVs being collected. The number of PHVs on the road has been impacted by the COVID-19 lockdown, however it is expected that vehicle volumes will increase as restrictions ease, allowing the main Trial Period will commence in 2020.
- WS1 and WS2 continue to progress more slowly than originally anticipated. Despite the project team putting significant efforts into securing new trial participants, the COVID-19 situation has impacted upon the progress of negotiations with interested parties and is likely to impact future vehicles deliveries (the main vehicle manufactures paused production in late March 2020, with many resuming production with limited capacity from May 2020). Centrica has not yet placed an order for a new EV fleet, as expected during this reporting period, due to issues caused by the COVID-19 lockdown. Despite these issues, the project continues to engage with partners and new potential trial participants to understand how the availability of EVs will align to the project timeline and requirements, this is discussed further in Section 3.3.

Key progress from each project workstream is highlighted in the following sections.

1.3.1 WS1, 2 & 3 – The Home, Depot and Mixed Charging Trials

In this reporting period, work has focused principally on WS3, following a decision in the last period to target spend towards areas where the project had confidence of vehicle volumes;

pausing the majority of development work in WS1 and 2 until there is more certainty on the volume of vehicles that will participate in the trials.

In WS1, Centrica had completed the testing of vehicles, selected a preferred manufacturer and had moved towards order prior to the COVID-19 lockdown. The lockdown has had an impact on progress as vehicle factories have been shut. However, recent easing of the lockdown has meant that increased visibility is emerging and as such Centrica expect to have clarity during the next month on order status and delivery. Progress has also been made in the procurement of a home charger, testing the charging solution and in designing the approach to utilising flexibility. Surveys have been carried out at the homes of existing British Gas EV drivers in order to plan the implementation of new charging infrastructure, although installation work has been delayed due to COVID-19. Work to secure additional vehicles for the WS1 trials has continued, however, discussions with a number of potential participants have recently been paused as a result of the disruption caused by COVID-19.

In WS2, the project has completed the installation of charge points (CPs) and CPCs at seven Royal Mail Depots and 220 EVs are now operating from these sites. Final commissioning of the CPCs and installation of site load monitoring that was expected to take place during March 2020 was delayed by the lockdown, imposed on 23 March 2020 but is now underway, with the CPs at the first site being connected to the project's iHost system in late May. In addition, a pilot site has been established at a Hitachi site to allow the project to test the solution and trial changes in a controlled environment before rolling out to live depots. The project is capturing a range of telematics data from vehicles involved in the trials. The partners have designed the approach to offering and monitoring profiled connections and UK Power Networks have made modifications to their existing network planning tool. An additional depot partner has been identified to join the depot trials; commercial and technical discussions have taken place, however discussions with a number of potential participants have recently been paused as a result of the disruption caused by COVID-19.

In WS3, Uber have been collecting and anonymising trip data from EVs on their platform and has provided data to May 2020. UK Power Networks and SSEN have been collating utilisation data of their secondary substations for the London Power Networks area and in West London respectively. Analysis of this data has now begun.

During this period, the Optimise Prime partners have had over 1,000 EVs on the road in the UK Power Networks and SSEN regions. The number of vehicles on the road in WS3 fluctuates with demand for PHVs, which has been negatively impacted by the COVID-19 lockdown. As a result of this, as of 1 June 2020 there were around 650 EVs on the road across the three trials. We expect the numbers to rebound as restrictions are lifted. A breakdown of EV numbers by workstream can be found in Confidential Appendix A.

1.3.2 WS4 – IoT Platform, Network Forecasting & Flexibility Analysis

During this period, the WS4 team focussed on completing the project's core IT platform. This work is now complete, and work is progressing on developing the interface to the data sources. A number of datasets from project partners and external sources are now available on the platform and initial analysis of this data, focusing on WS3, has begun.

While most work on supporting the Trials Operational Applications has been paused, Optimise Prime has continued to make progress on developing the Depot Planning Tool prototype and defining how the trials will test flexibility.

UK Power Networks have initiated an enablement piece of work with the vendor of the Active Network Management (ANM) System which aims to capture the high-level ANM requirements and use cases as well as establishing a costed programme of work to deliver all requirements.

1.3.3 WS5 – Economic Analysis & Business Models

The Economic Analysis & Business Models workstream began work in January 2020 and has created the first draft of a High-Level Total Cost of Ownership model which will be validated once the trials have begun.

1.3.4 WS6 – Reporting & Deliverables

The project's first PPR was submitted to Ofgem on 19 December 2019 and published on the project website.

Deliverable D2, "Solution build report – lessons learned", was originally scheduled to be published on 28 February 2020. The publication of this report has been delayed as a result of the pause in development activities. Optimise Prime currently plans to issue this deliverable on or before 26 February 2021.

1.3.5 WS7 – Project Management & Sharing Learning

Following the decision of the project board in November 2019 to pause some development work of WS1 and WS2, the project management team have focused on re-planning the project's work to ensure that the expected learnings and deliverables can still be achieved within the agreed budget. The project management office has also coordinated the process to approaching and negotiating with potential new participants to join the WS1 and WS2 trials.

The Design Authority has continued to support the other workstreams by managing the design of the platform and application elements of the project.

Engagement with stakeholders has continued throughout this reporting period, with notable examples including a joint knowledge exchange webinar hosted by UK Power Networks titled 'Changing Lanes' with SP Energy Networks' NIC project Charge (23 April) and a presentation at UK Power Networks' Net Zero Networks Forum (11 March).

1.4 Risks and issues

The project operates a robust risk management process in order to reduce the probability of risks occurring and lessen the impact of any issues upon the project. The full risk register can be found in Section 10.

As introduced in the last PPR, the main issue faced by the project continues to be the limited availability of electric light commercial vehicles (LCVs) and the impact that this is having on the project's ability to begin the Trial Period with the planned volume of vehicles within the project timeframe. The project has implemented targeted spending to partially mitigate the risk of this issue impacting on project learnings. The project notified Ofgem on 20 February 2020 the outstanding deliverables will each be delayed by 364 days as a result of the delays to solution development and the Trial Period.

While there have been signs of more vehicle models coming to market during 2020, since the notification of the non-material change to Ofgem the unforeseeable impact of COVID-19 caused temporary suspensions of automobile manufacturing from late March and is likely to further restrict vehicle supply and lengthen order lead times. The extent of this disruption, and how long it will continue for is not clear at the time of writing.

Beyond the disruption of EV supply chains, the response to COVID-19 has had some impact upon the project during this period and continues to create uncertainty. In line with government advice, project team members have spent significant time working remotely and have been able to continue delivering most aspects of the project through the use of collaboration tools. However, site-based project work was paused between March and May 2020 in order to limit unnecessary travel and social interaction. This situation has delayed the commissioning and testing of depot systems, which was due to take place in March 2020.

The lockdown has also impacted upon the day-to-day operations of the project partners. For example, there has been a significant drop in the demand for PHVs in London. As a result, there may be delays to the start of the WS3 trials to allow journey volumes to recover and the Uber EVs to be put back on the road. The extent of this risk is still unclear because, although other countries have seen a rapid recovery in journeys following the lifting of lockdown measures, it is uncertain if the same will be observed in the UK.

The project has completed an impact assessment of COVID-19 and created a COVID-19 specific risks log. The initial view of the impact assessment of COVID-19 to the project has been shared with Ofgem by UK Power Networks in a bilateral meeting on 15 April 2020. The project team will explore any and all options available to mitigate the evolving impact of COVID-19 on the project delivery as much as possible.

On 5 June 2020 the Project Board considered the impact assessment together with a report commissioned by the project to identify the volume of vehicles required by each trial to achieve statistical significance. It was agreed that Optimise Prime should revise the targeted trial volumes to ensure the trials can be delivered in a timely and cost-effective way while maintaining statistical significance and delivering the promised learnings. Ofgem was informed of this decision in an update meeting on 9 June 2020.

1.5 Project Learnings

Optimise Prime is still at an early stage in its development, and it is expected that the majority of the project learnings will materialise after the trials have begun.

As the project has begun to implement depot infrastructure the complexity of integrating trial systems within operational depots has become clearer, especially with regard to the number of outsourced service providers, such as facilities, electrical and IT contractors that need to be involved. Identifying and involving these stakeholders from an early point in project planning would ensure responsibilities are clearly defined and understood. The project has also learnt lessons with regard to how the depot charging method can be integrated with a depot's existing third-party Charge Point Operator (CPO).

Optimise Prime continues to generate learnings with regards to the factors that are driving and influencing the electric vehicle transition for commercial fleets. Even where fleets are heavily engaged with the project and are committed to electrification, external factors, particularly the availability of suitable EVs from manufacturers, are generally driving their ability to electrify quickly.

Early analysis of project data has also generated learnings with regards to the availability and quality of data on EV charging infrastructure. More detail on project learnings can be found throughout Section 2 of this report.

2 Project Manager's report

2.1 Progress in this reporting period

Despite the challenges experienced on vehicle availability the project has made good progress during this reporting period:

- The project partners have made progress in discussions with potential new participants for WS1 and WS2, although with the advent of the lockdown, this work has slowed
- The installation of the CPCs for WS2 phase 1 was completed and all vehicles for this phase are now on the road
- The approach to delivering profiled connections has been designed
- The profiled connection assessment add-on functionality to UK Power Networks' existing network planning tool has been built and is undergoing User Acceptance Testing (UAT)
- The first phase of the ANM development work has been initiated
- The Geospatial Analytics (GSA) use cases for Optimise Prime have been developed
- Analysis of data and execution of the trial experiments for WS3 commenced
- Build of the project's analytics platform minimum viable product was completed, with the system now containing data from a number of sources
- The business model workstream began work and has developed a total cost of ownership model for validation during the trials
- The project plan and budget were re-planned, based on a decision in the previous period to pause some project activities, and extend the project by 364 days
- As a result, a notification was issued to Ofgem on 20 February 2020 informing Ofgem of a non-material change to the issue date of the project deliverables (up to 364 days delay)
- A joint webinar was held with the Charge project to disseminate learnings.

Each of these items is considered in detail in the relevant sections of this report.

2.1.1 Project Partner meetings

Optimise Prime has continued to operate a project steering board, comprising all project partners on a quarterly basis. During this period meetings have been held on 3 March and 5 June 2020.

In addition, a weekly project progress reporting process has been put in place between Hitachi Europe, Hitachi Vantara, Royal Mail, Centrica, Uber and UK Power Networks and all project partners contribute to the Optimise Prime workstreams.

2.1.2 Project team

Optimise Prime has continued to maintain a project team of specialists throughout this reporting period, supported by the project partners. Since the last report the application development team was ramped down, in December 2019, following the project's decision to pause this work. The Data Analytics & Innovation team has been expanded in order to manage and analyse the data being generated by WS3.

Figure 1 shows the organisation of the project teams.

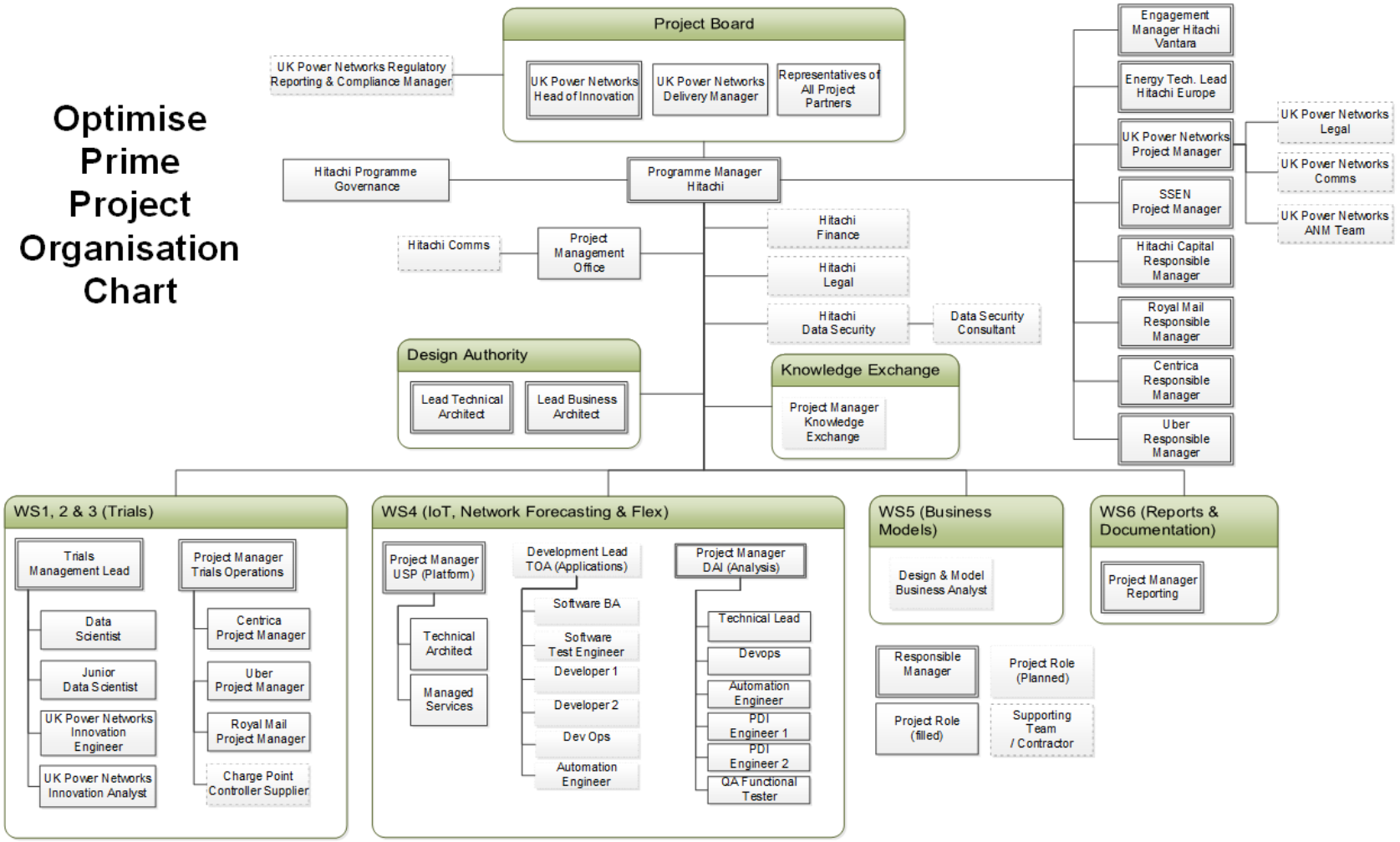

Figure 1 – Optimise Prime Organisation Chart

2.2 Workstream progress

2.2.1 WS1, 2 & 3 – Home, Depot & Mixed Trials

These workstreams are responsible for the design and implementation of the Optimise Prime's three trials: home, depot and mixed charging.

2.2.1.1 WS1 – Home trial

The home trial, outlined in Figure 2, is implementing technologies to monitor and manage commercial EVs charging at home, as well as testing their ability to provide flexibility services.

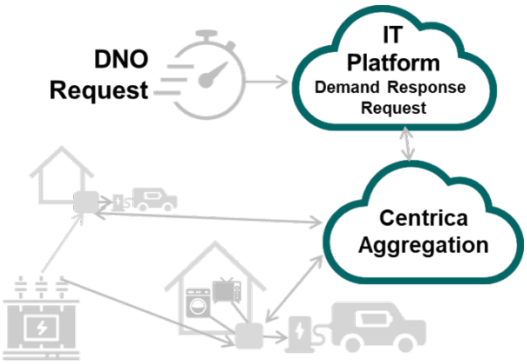

Figure 2 – Schematic of WS1 trial

In the home trial, Centrica have:

- Tested a number of EVs and completed selection of an EV supplier
- Consulted with drivers to identify which are interested and suitable for adopting EVs
- Approached a number of additional fleets to join the home trial to ensure the required volumes are met
- Re-planned the integration of the system that will control and aggregate the CPs in the return-to-home trial taking into account delays in the delivery of vehicles
- Selected a preferred CP technology – Centrica now plan to test these chargers and the wider solution at homes of a number of existing EV drivers before implementing them more widely once the vehicles become available.
- Surveyed the homes of existing EV drivers in order to install new CPs

UK Power Networks, Centrica and Hitachi all took part in a number of meetings to develop the methodology for requesting and testing the response of flexibility systems and the design of this functionality is ongoing.

UK Power Networks drafted the high-level requirements of the Active Network Management system necessary for the trial of flexibility services provision. These requirements are in the process of being refined.

2.2.1.2 WS2 – Depot trial

The depot trial, shown in Figure 3, is implementing a range of technologies to allow depots to electrify economically by putting minimum additional peak load on the distribution network. Activity in this workstream has largely focused on completing the infrastructure for the first phase, trial A.

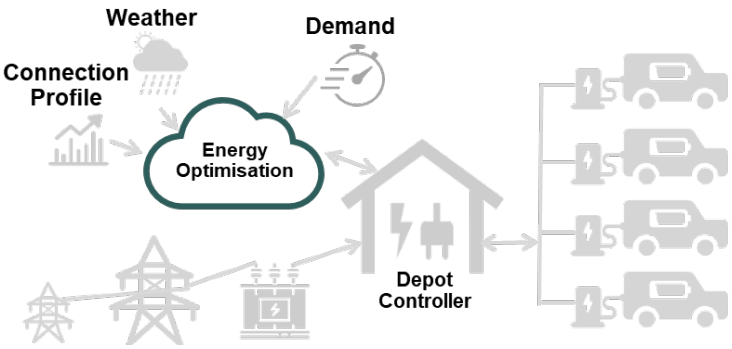

Figure 3 – Schematic of WS2 trial

In the depot trial, Royal Mail have:

- Completed the acceptance into their fleet of 190 new EVs, increasing the number of vehicles taking part in the trials to 220 (Figure 4)
- Completed groundworks and charging infrastructure across seven depots to support the introduction of the new vehicles
- Implemented a programme of driver training, based on lessons learned from earlier EV introductions.

Figure 4 – Mercedes eVito vans at Royal Mail's Mount Pleasant Mail Centre

Hitachi have:

- Together with contractor Nortech, installed CPCs at the seven Royal Mail depots
- Built a test site at a Hitachi office location with CPC and chargers replicating those at Royal Mail depots to allow testing of changes before rollout to operational depots (Figure 5)
- Implemented site load monitoring at the test site. This solution is planned to be rolled out across the Royal Mail depots
- Commissioned the systems at the test site, including links between the CPC, the central iHost system and the CPO's back office
- Worked with UK Power Networks to develop the approach to implementing the profiled connection product
- Utilised the Depot Planning Model to analyse the charging requirements of further Royal Mail sites that were intended to be included in the second stage of the trial
- Further developed the Depot Planning Model by transitioning it from a Microsoft Excel based tool to the Python programming language and began planning the future development of a web-based version

- Led commercial negotiations with a potential additional participant in WS2.

Figure 5 – CPC and CPs at test site, replicating depot installations

Within this reporting period, UK Power Networks have:

- Carried out connection and network planning assessments for 20 Royal Mail depots. These assessments covered varying fleet electrification rates and different EV charging scenarios, amounting to a total of 132 cases assessed. In each case, a cost of connection was estimated, and where possible a time to complete the connection works was estimated as well. The results of these assessments concretely demonstrated the significant cost and time savings enabled by EV smart charging, which is the fundamental behaviour on which Optimise Prime's methods rely
- Worked with Hitachi to develop the profiled connection methodology
- Designed the profiled connection offer to ensure it is as valuable as possible to customers
- Defined the trial conditions of profiled connections to make sure the product can be robustly demonstrated while ensuring network resilience and reliability at all times during the trial
- Collaborated with SSEN to harmonise their approach of profiled connections across DNOs
- Successfully completed the build phase of the profiled connection assessment add-on functionality to the existing network planning tool, DPlan, which will allow assessment of capacity headroom and network constraints based on historic data to offer customers the opportunity for a flexible connection.

Within this reporting period, SSEN have provided network data for proposed depot sites in their region and have worked with UK Power Networks to peer-review the profiled connection methodology.

2.2.1.3 WS3 – Mixed trial

The mixed trial, shown in Figure 6, collects anonymised trip data from PHVs in the London area and will analyse this data to forecast future charging demands and network impacts.

In the mixed trial, Uber have:

- Provided anonymised EV trip data to Hitachi on a monthly basis

- Outside of the scope of Optimise Prime, Uber continued to operate its Clean Air Plan helping drivers upgrade to EVs and provided EV support and training to drivers through its Greenlight Hubs
- Uber also progressed discussions with vehicle manufacturers to ensure supply of vehicles to their driver partners, announcing a partnership with Nissan to make 2,000 Leaf EVs available to Uber driver partners.

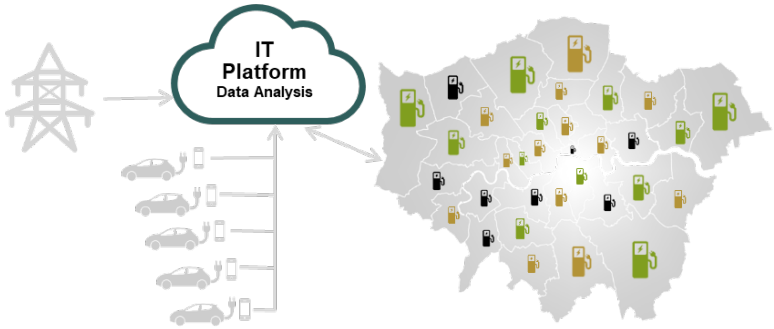

Figure 6 – Schematic of WS3 trial

UK Power Networks and SSEN have continued to provide the project with updated information on the utilisation of secondary substations in the areas where Uber operates.

Hitachi has implemented technology to capture the data from Uber, UK Power Networks, SSEN and other sources, including CP location database ZapMap, and has begun initial analysis of journey and charging patterns and execution of the trial experiments, working together with data analysis experts FTI Consulting.

Discussions were held between Hitachi, Uber and UK Power Networks to define the required outputs of the data analysis.

2.2.1.4 Challenges & lessons learnt (all trials)

As the project has moved from the initial design to the implementation phase, Optimise Prime has encountered a number of challenges arising both from the varying requirements of project partners and the impact of external factors and events.

Vehicle acquisition

Vehicle acquisition has continued to be the most challenging aspect of delivering Optimise Prime. This is an issue that effects many fleets currently looking to electrify as the number of EV LCVs available to the market remains limited and prices remain high as a result. As reported in the previous PPR, more models are being released throughout 2020. However, most European vehicle manufacturers have had to suspend production, towards the end of March, as a result of COVID-19 and this is likely to further delay vehicle availability for fleets.

Due to this, the project has had difficulty in securing sufficient volume of vehicles to carry out the trials during the planned period. To mitigate this issue the project is working to secure additional partners and is delaying the start of the Trial Period as communicated to Ofgem on 20 February 2020. However, this work has now slowed because of COVID-19. Since the start of the lockdown period the number of vehicles on the road in the Mixed trial has also dropped. Vehicle manufactures, who are key to WS1, paused production in March, and this has meant that Centrica's order, planned for April 2020, was not placed. As a result, the timing of vehicle deliveries is highly likely to be delayed, and the full order of EVs may not be on the road by the scheduled start of the trials, currently planned for July 2021.

As part of the discussions with potential additional trial participants, a number of lessons have been learnt from considering how new participants can adopt the project's methods. A wide range of existing EV infrastructures of varying specifications and standards were encountered, supported by a variety of supply and maintenance arrangements. This has required the project to consider alternative processes to carry out the project methods of measuring and controlling charging activity. If implemented, these alternatives will enable the project to appraise a range of different processes and present findings on their relative merits.

Depot installations

Installing trial equipment in the WS2 depots has proved more challenging than originally planned, due to the complexity of integrating trial systems within a number of existing operational depots. In common with many large organisations, Royal Mail outsource a number of non-core functions and as a result the project has needed to collaborate with a number of parties which were not involved at the initial planning stage. These include facilities, electrical and IT contractors to install equipment on the sites alongside outsourced CP installers and back office system operators. Key learning points from this activity include the need to have clearly defined responsibilities for all stakeholders, including subcontractors, as early as possible in the planning process.

CP Operation and Management

In designing the CP optimisation system for depots, the potential impact of the methods on CPOs has become clearer. Many businesses outsource the day-to-day management of their CPs to specialised companies rather than maintain inhouse expertise to manage them. CPOs manage alerts and error messages from CPs and increasingly may attempt to control chargers based on their own optimisation algorithms. If the methods employed by Optimise Prime are not sufficiently integrated with the CPO they may risk generating spurious errors or infringing on commercial agreements between the depot operator and CPO. The project is taking a number of actions to ensure robust integration with CPO back office systems.

Statistically significant results

As raised in the previous PPR, the Project Direction requires the project partners to endeavour to run each trial with sufficient vehicles to be able to demonstrate statistically significant results. In order to quantify this requirement, the project contracted Imperial College London Consultants to conduct an independent assessment of the design of the trials, assessing the statistical significance of the proposed trial samples and making recommendations for improvements. This review broadly supported the approach taken in the trials and provided additional suggestions. This included adopting a two-stage adaptive sampling methodology which involves conducting an initial analysis to define the overall distribution curve and degree of variance, determining which variables (e.g. daily mileage, shift times) have the biggest influence and identifying the number and type of vehicle behaviour groupings required and exploring the degree of variance in the groups. This should then be followed by oversampling the tails of groupings with high variance – i.e. run more experiment iterations for vehicles with behaviour furthest from the mean (e.g. longest routes) to ensure statistical confidence. It was also recommended that the characteristics of the populations to which the results can be extrapolated should be clearly defined in communicating the trial results. These findings will be incorporated as the trial methodologies are refined and will be utilised to guide the project's next steps in securing EV volumes.

Modelling potential costs

Determining how to model the likely cost of network reinforcement for a given capacity exceedance is challenging. The costs associated with CP connections do not scale linearly with the amount of additional connection capacity required and vary significantly depending on location, hence it is difficult to establish general figures for installations. The reason for this is that the costs associated with providing a connection are based on a number of factors including: first of all, the available capacity on the existing network, the diversity of demand,

the nature of increased capacity being in blocks due to the standardised size of transformers or conductors and to a certain extent the type of network in that area. This adds complexity to the challenge of creating a total cost of ownership model for a depot-based fleet. A range of potential costs will be analysed as part of the TCO modelling to overcome this.

Public CP data
From the initial analysis of Uber journeys against public CP data, it became apparent to the project that there is a lack of a fully comprehensive and authoritative source of charger locations and details. While the project uses data from Zap-Map, identified as the best available source, data quality issues such as duplicate entries and lack of 'taxi only' flags have been identified. This is thought to be largely due to the fact that Zap-Map relies on a wide range of sources, including crowdsourcing, to gather its data which makes it difficult to validate all information. Where issues have been identified, these have been reported to the data provider and the project team continue to monitor for data quality issues that may impact trial conclusions.

2.2.1.5 Outlook for the next reporting period

During the next reporting period the trials workstreams will focus on:

- Discussing the impact of COVID-19 and agreeing how to mitigate the delays to the project timeline
- Commence testing of the charging solution for WS1 homes (assuming the lockdown is lifted)
- Final commissioning the WS2 Trial A depots allowing initial tests
- Data integration with WS2 CPs (assuming approval to re-mobilise the technology teams)
- Beginning the main Trial Period for WS3
- Signing up additional trial participants for the WS1 and WS2 (assuming they will be open to resume negotiations depending on the wider COVID-19 circumstances)
- Re-instating the technical development team, allowing work to resume on the depot optimisation system, flexibility tools and the web-based version of the depot planning model, subject to approval by the project board based on EV volume certainty
- Continued refinement of trials design and the profiled connection methodology to demonstrate successful use of profiled connections
- Completing UAT sign-off of the profiled connection assessment add-on functionality to UK Power Networks' existing network planning tool
- Defining a network fail-safe mechanism for the trial of profiled connections, including a disconnection process to be used as a last resort measure in case of profile breach to ensure network resilience, and a restoration process
- Defining the monitoring solution required to implement the profiled connection offering
- Definition of flexibility products to trial and generate learnings regarding availability, value and reliability of flexibility procured by commercial EV fleets
- Refinement of the methodology for trialling flexibility services provision.

2.2.2 WS4 – IoT Platform, Network Forecasting & Flexibility Analysis

This workstream is responsible for the delivery of the Optimise Prime IT platform and the use of the platform to provide analytics resources and services to the trials. WS4 will also support WS1 and WS2 through the development of the Trials Operational Applications (i.e. the Depot Planning Model, depot optimisation system and flexibility services) and WS3 through the development of the data analysis capability. UK Power Networks will develop the capability within their systems to receive and process profiled connection applications and manage the provision of flexibility services as part of this workstream as well as modifying the existing

Geospatial Analytics (GSA) tool to maintain and use the full dataset from the project for specific use cases.

2.2.2.1 Progress during this reporting period

This workstream has made significant progress in this period, completing the commissioning of the IT platform and developing the data ingestors and analytics tools needed for workstream 3. Work on WS1 and WS2 have been largely paused. Main activities have included:

- Completion of the IT platform build
- Ramping down the Trials Operational Applications team, as per November 2019 board meeting direction, to pause spend in this area until there is more certainty on meeting EV volume requirements
- Implementing the Information Risk Management System and related security measures
- Expanding the Data Analytics and Innovation team to analyse the data for WS3 and implementing the basic analysis tools required by the team
- Building technology to capture data from Uber, UK Power Networks, SSEN, telematics systems, CP and weather services
- Capturing the first 15 months of EV data from Uber, and performing initial analysis
- Initial design of the flexibility trials, flexibility products and operating model

In addition, UK Power Networks have started the first phase of work to define the detailed requirements and use cases for the ANM system development work required to facilitate the trial of profiled connections and flexibility services. UK Power Networks have started to identify key use cases to develop in their internal GSA platform to facilitate fleet electrification.

2.2.2.2 Challenges & lessons learnt

The key challenge faced by the workstream in this period has been managing the ramp down of the development team and ensuring that progress made to-date has been appropriately documented to enable an efficient ramp-up when required. This has been achieved through use of the project's collaboration and work management tools.

2.2.2.3 Outlook for the next reporting period

Over the next reporting period WS4 will focus on:

- Supporting the analytics required for WS3
- Continuing to develop platform capabilities in line with trial requirements
- Ramping up team to resume build of the Trials Operational Applications (EV numbers dependent)
- Capturing data from and testing control of WS2 trial A depots
- Adapting solution design to add further participants to the trials
- Carrying out a program of works to deliver the Optimise Prime ANM requirements thus enabling the trial of profiled connections and flexibility services provision
- Carrying out a procurement exercise to source a supplier for the development of the GSA tool and progress on delivery

2.2.3 WS5 – Economic Analysis & Business Models

This workstream is responsible for further developing the business case that was put forward in the FSP. This business case will consider cost savings and improving use of capacity. It will also study the TCO impacts of the project methods and make recommendations on use of these methods by both vehicle operators and DNOs to reduce the cost and impact of the transition to EV.

During this reporting period this workstream has drafted the high-level TCO model that will be tested during the trials. This document is currently under review by the project partners. Further progress in this workstream will follow as the trials begin.

2.2.4 WS6 – Reporting & Deliverables

This workstream is responsible for the creation of the project deliverables that are published and submitted to Ofgem in line with the Project Direction.

During this period WS6 has focused on this Project Progress Report, while collating information that will be used in future deliverables. The status of Optimise Prime's future deliverables can be found in Section 6.

2.2.5 WS7 – Project Management & Sharing Learning

This workstream is responsible for the overall management of the Optimise Prime project and its Partners, ensuring the project delivers to time, scope and budget. WS7 also incorporates a project Design Authority and knowledge exchange activities.

The Design Authority is responsible for managing the overall architecture of the project's systems, as well as reviewing the trial designs and ensuring that the design of the applications and analytical services meet the requirements of the trials.

2.2.5.1 Progress during this reporting period

During this reporting period, the workstream focused on the following activities:

- Running the project's governance and producing regular project status reports
- Maintaining the detailed project plan and budget
- Updating the project plan and budget to reflect the decision to target spending and extend the project timeline
- Notified Ofgem of a non-material change with regard to the completion of future deliverables
- Re-profiling the payment schedules of the project partners to reflect the extension of the project timeline
- Maintaining the project Risks, Assumptions, Issues and Dependencies (RAID) log, including liaising with stakeholders regarding COVID-19 related risks
- Chairing weekly project update meetings with workstream leads and Project Partners
- Managing the new partner search and acquisition process
- Providing the design authority function for WS1-4
- Convening the Security Working Group and implementing the information risk management system
- Reviewing the deliverables of the other project workstreams
- Maintaining the project website, www.optimise-prime.com
- The planning of conference speaking engagements and dissemination events. Further details of these can be found in Section 8.

2.2.5.2 Challenges & lessons learnt

The principle challenge faced by WS7, during this period, has been managing the uncertainty regarding the availability of vehicles for the trials. The WS7 team has planned the ramp-down of the development team, ensuring that progress is sufficiently documented to ease the process of resuming. The project management office notified Ofgem on 20 February 2020 of a one-year delay to the completion of project deliverables and has re-cast the project plan and budget reflecting the impact of these changes, ensuring that the project stays within the total budget despite a longer duration.

COVID-19 has created a great deal of uncertainty and continues to do so. The pandemic has impacted the project on a number of fronts, including restricting ability to visit depots to complete WS2 commissioning, disrupting EV supply chains and impacting on the businesses of the project partners. The WS7 team has reviewed impacts each week with partners and suppliers in order to identify risks to the project and, where possible, propose mitigations. UK Power Networks provided an initial view of the impact assessment of COVID-19 on the project to Ofgem on 15 April 2020 and on 5 June 2020 the Project Board made a decision to revise the EV volume targets for each trial to ensure learnings will continue to be delivered within the revised timeframe communicated to Ofgem.

The effort involved in implementing an information risk management system (the framework, policies and procedures that govern how the project handles data), which was required as a result of the nature of the information being held by the project, should not be underestimated. It has taken significant time for the project to design and implement a system that meets the security requirement of all project partners. Information security teams should be involved at an early stage in the development of a project to ensure that their requirements are taken into account during the initial scoping and design.

2.2.5.3 Outlook for the next reporting period

The project management workstream will continue to manage Optimise Prime in the next period in line with the established governance procedures. When the conditions are met for the Project Board to give the go-ahead the WS7 team will co-ordinate the re-establishment of the development team and the scheduling of work and budgets to allow the trials and the deliverables to proceed with minimum delay.

Following the completion of an impact assessment on altering the number of EVs in the home and depot trials, based upon the recommendations of the statistical analysis completed by Imperial College Consultants and the partners' forecasted vehicle volumes, the PMO team is now planning the revision of EV targets for each trial and is assessing how EVs located outside of the UK Power Networks and SSEN areas could be utilised within the project. It was planned that during the next reporting period the project will conclude agreements with additional partners, however, this is subject to the impact of COVID-19. The outcome of this impact assessment will ensure that the project's trials still deliver the anticipated learnings.

Additionally, the project will continue to manage a programme of dissemination activities. The project expects to participate in the Cenex-LCV2020 Conference in September and the Low Carbon Networks and Innovation Conference in November, in whatever form the events take place in.

2.3 Business case update

At this stage the project has not become aware of any circumstances that may significantly impact upon the business case that was submitted in Optimise Prime's FSP.

It is expected that there will be impacts on EV take-up as a result of delays in vehicle availability and the effect of COVID-19 on supply and demand. However, some policy changes may boost EV uptake, such as the Office for Low Emission Vehicles' current consultation to bring forward the end of petrol, diesel and hybrid car and van sales to 2035.

The Optimise Prime business case will be regularly re-assessed as more data becomes available or changes occur that require a review of the original assumptions.

3 Progress against plan

This section of the report summarises the progress the project has made throughout this reporting period, highlights changes made since the FSP submission and reports issues faced by the project.

3.1 Detailed progress in the reporting period

At the end of the last reporting period, in November 2019, the project board made the decision to pause certain project activities pending the confirmation of the availability of enough vehicles to carry out the trials. This pause has principally impacted progress in WS1 and WS2, together with elements of WS4 that support these workstreams. At the time of writing these activities are still paused. The availability of vehicles and pause in development resulted in a change to the project plan, notified to Ofgem as a non-material change on 20 February 2020, delaying the completion of outstanding deliverables by 364 days.

The project has made progress in securing additional participants for the WS1 & WS2 trials, although the finalisation of these agreements has slowed as a result of the COVID-19 related disruption.

WS3, mixed trials, has made good progress. The project has been collecting data from an increasing number of vehicles throughout 2019 and 2020, the data analysis platform has been put in place, together with technology to capture the required data sets. While there have been fewer private hire EVs on the road due to the COVID-19 lockdown, the project expects to be able to begin the WS3 Trial Period once operations return to normal.

Table 1 details the status of key project activities expected in this reporting period:

Table 1 – Key Project Activities planned within the current reporting period

Task name	Sub-activities	Status at end of period
Trials (WS1, 2 & 3)		
Design trial	Detailed design of the trial experiments	In progress, finalisation pending confirmation of EVs for WS1 & 2, see Section 3.3
WS1 Home trial		
Confirm EV rollout (Home trial)		In progress, pending EV availability, see Section 3.3. Disrupted due to COVID-19
New participant selection	Find additional participants for Home trial	Advanced discussions with two target companies. Disrupted due to COVID-19
Select trial technology solution		Centrica has selected a CP supplier and is beginning testing with existing EVs
WS2 Depot trial		
Trial A depot Infrastructure & CPCs installed	Implementation of EV charging infrastructure at Trial A depot sites	CPs and CPCs installed. Load monitor install and Final Commissioning delayed by COVID-19 restrictions
Confirm EV rollout		220 Royal Mail EVs are now in use, completing trial A rollout
Profiled Connection requirements & design	Design profiled connection methodology and modify existing UK Power Networks' planning tool	Initial design of profiled connection methodology completed. Ongoing refinement of some trial aspects, such as the disconnection and

Task name	Sub-activities	Status at end of period
		restoration processes in case of profile breach. Build phase of profiled connection assessment add-on to DPlan tool completed
New participant selection	Find additional participants for Depot trial	Advanced discussions with additional participant. Disrupted due to COVID-19
WS3 Mixed trial		
Confirm EV rollout (Mixed trial)		In progress, EV growth slowed due to COVID-19
Data capture and analysis (Mixed trial)	Capture of data from Uber vehicles	In progress, on schedule
	Analysis of data from Uber vehicles	In progress, on schedule
WS4 IoT Platform, Network Forecasting & Flexibility Analysis		
Analytics platform – develop & test	Detailed design and build of the analytics platform	Complete
	Build of data ingestors	In progress, all required data for WS3 complete
Depot Planning & Optimisation Systems	Design and Build	Depot Planning Model prototype complete. Other work paused pending vehicle availability see Section 3.3
ANM modification (Phase 1)	Detailed requirements specification capture and establishing a program of work for Phase 2 (Build & Test)	In progress, on schedule
WS5 Business Model		
High Level TCO Model	Draft model	Model drafted, in review
WS6 Reporting & Deliverables		
Project Progress Report June 2020	Compile report	Complete
Deliverable D2	Compile deliverable	Outlined, due for completion by 26 February 2021, see Section 6
WS7 Project Management & Sharing Learning		
Support & Review project design and implementation processes	Design of the Universal Service Platform	Complete
	Detailed design of the analytics platform	Complete
Depot tools/systems requirements and design	High level design	In progress, behind schedule. Work to accelerate once WS1/2 vehicle volumes confirmed. See Section 3.3
Network Flexibility Model Requirements and design	High level design	In progress
Dissemination Events	Joint event with Charge project and UK Power Networks Net Zero Networks Forum	Events held
Website design and build	Maintain website	Ongoing

Task name	Sub-activities	Status at end of period
Project management	Re-cast plan and budget with delayed Trial Period	Complete
	Project reporting and governance	Ongoing

3.2 Summary of changes since the previous PPR

Since the FSP there have been no material changes, as defined in the NIC Governance document v3.0.

A summary of the project plan is shown in Figure 7. The following non-material changes have been made to the plan:

- The start of some development activities in WS1, 2 and 4 have been delayed following the project's decision to pause this work
- The start of the Trial Period for WS1 and 2 has been delayed from October 2020 until July 2021 due to the delay in the acquisition of vehicles
- The expected delivery date of all project deliverables (other than Deliverable 1) has been delayed by 364 days
- Other project tasks have been re-timed in line with the delay to the deliverables and Trial Period.

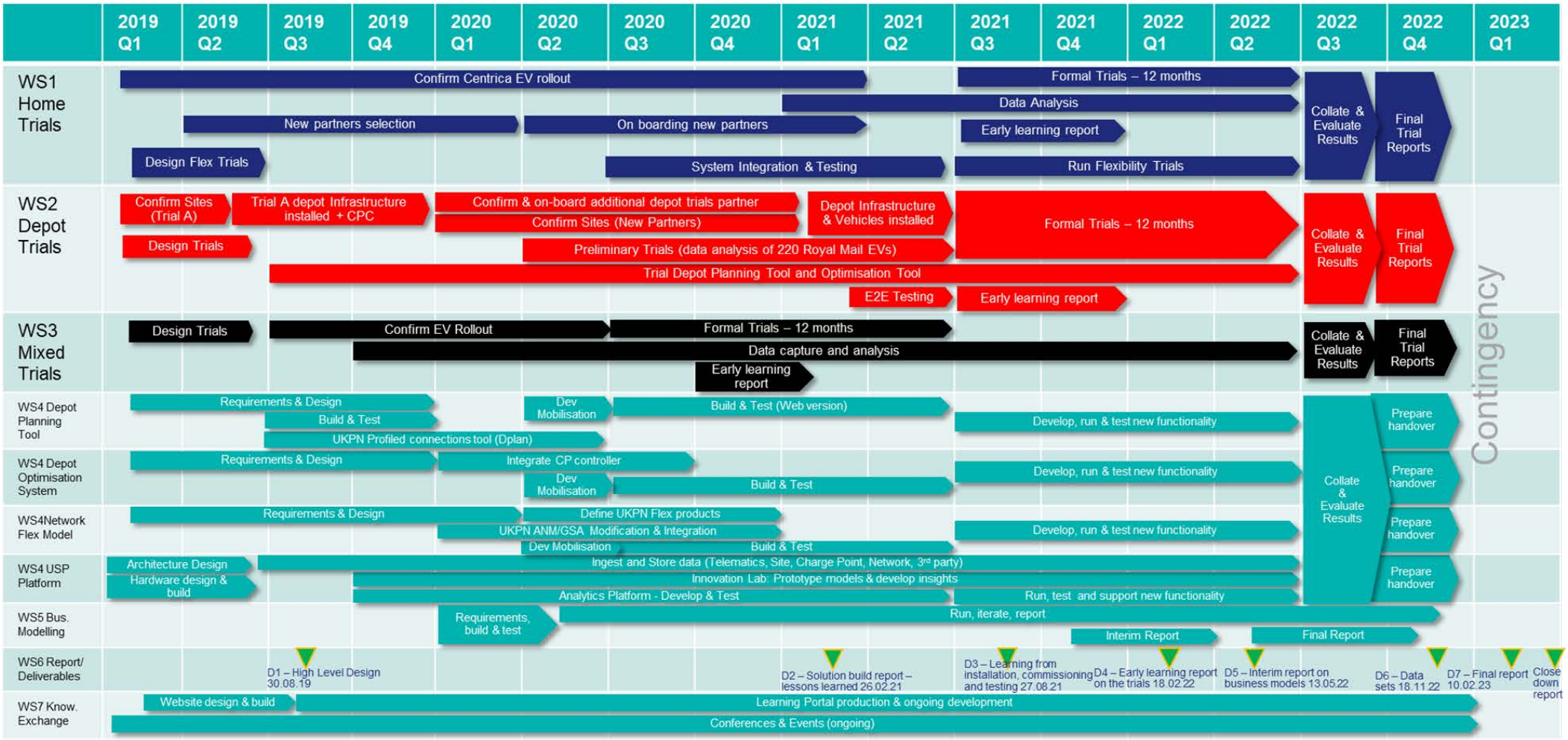

Figure 7 – Summary Project Plan, updated following non-material change communicated to Ofgem on 20 February 2020

3.3 Identification and management of issues

In line with the Project Direction, the project must ensure that there is a statistically significant volume of vehicles involved in each trial in order to be confident that the learnings from the trials would be valid when scaled to GB level. Optimise Prime's ability to reach this number continues to be the key risk faced by the project.

As explained in the previous PPR, in April 2019, Centrica notified the project that it would not be possible to deploy sufficient EVs to meet the start of the planned formal 12-months Trial Period, in September 2020. In October 2019, Royal Mail have also made changes to their EV rollout plan that has had an impact on the project timelines. These changes were the result of a number of issues with availability, cost and legislative changes affecting electric LCVs that were not foreseen when the project was originally planned. This has been managed by delaying the WS1 and WS2 Trial Period. As a result, the project implemented a non-material change and notified Ofgem, on 20 February 2020, that completion of deliverables 2-7 will be delayed by up to 364 days to allow time for vehicles to become available.

In this reporting period the project team has continued to take actions to mitigate the impacts of this issue:

- The project runs a regular meeting to manage the identification and on-boarding of new participants to supplement the vehicles in WS1 and WS2
- Discussions have progressed with several operators of return-to-home and return-to-depot commercial vehicles. Companies have shown strong interest in becoming involved in the trials, although technical and commercial discussions have taken longer than planned. These discussions have now slowed because of the COVID-19 disruption
- Centrica has continued with their vehicle procurement, although the new EV fleet order they were planning to place placing in April 2020 was delayed and the expected lead time have been impacted by the COVID-19 lockdown
- Application development and a number of other tasks related to WS1 and WS2 have been paused in order to minimise project spend until there is more certainty on meeting the EV volume requirements
- A meeting was held with TfL to discuss the impact of planned changes to the London Congestion Charge
- An independent consultant, Imperial College Consultants, has reviewed the trials design and made recommendations on the minimum number of vehicles that would need to be included in each trial in order to be statistically significant
- The project is closely following developments in the commercial EV market to identify suitable models becoming available.

Since Ofgem was notified of the non-material change, delaying project deliverables, on 20 February, further delays have occurred as a result of the COVID-19 lockdown. The project's efforts to attract new participants have also been impacted.

A meeting of the project board on 5 June 2020 considered the issues facing project delivery and the recommendations of the Imperial College Consultants report on the sample sizes needed for statistical significance. Several options were discussed, including:

1. Revising the number of EVs in each trial to create greater confidence that the project can be delivered within the agreed timescale, while still achieving statistical significance
2. Attempting to meet a target of either 670 (option 2a) or 1,000 (option 2b) vehicles in each trial, extending the project if necessary

3. Pausing the project until there is confidence that the target of 3,000 vehicles across the three trials can be met
4. Recommending that Ofgem halt the project.

Having reviewed the options and considered which one was in the best interest of customers, the project team decided to pursue option 1 and revise the trial volumes. The project will also consider involving vehicles outside of the UK Power Networks and SSEN areas in trial activities where network monitoring is not required. Taking such steps will give project stakeholders assurance that the outcomes of the project will be achieved within a reasonable timescale, allowing the methods and findings to start benefiting network customers as early as possible. Revising the trial volumes will also create more certainty in the deliverability of the project plan, ensuring the project utilises its resources efficiently and cost effectively.

It was considered that, as there is no clarity of when the original targets may be achieved, options 2 and 3 would both introduce additional risk of the project not delivering learnings within a reasonable timescale and exceeding the project budget. It was decided that this would likely not be in the best interests of network customers. Given significant costs have already been incurred in delivering the project to date it was not thought that Option 4 was an appropriate course of action as the project partners believe that Optimise Prime is still able to deliver the benefits set out in the FSP and these benefits would not be realised if the project were halted.

The project does not consider that pursuing option 1 constitutes a change (material or non-material) as the project will continue to meet the requirements of the Project Direction. Ofgem's Project Officer was informed of this decision in a meeting on 9 June 2020 and the project will notify Ofgem of the revised targets once these are confirmed.

Section 10 provides a full list of the risks that are being monitored by the project.

3.4 Look-ahead to next reporting period

The detailed tasks for each workstream for the next reporting period are described in Section 2. In summary, the key tasks for the next period are:

- WS1 – Home Trials
  - Confirm introduction of additional trial participants plan for arrival of Centrica EVs once the roll-out schedule is known
  - Begin development of home charging solution and integration with IoT platform
  - Finalise flexibility model for home fleets
- WS2 – Depot Trials
  - Begin analysing data from Trial A
  - If feasible, confirm additional fleet participant(s) in order to proceed with Trial B
  - Refine network operations processes to trial profiled connections robustly while ensuring network resilience
  - Sign-off UAT of the profiled connection assessment add-on functionality to UK Power Networks' existing network planning tool and Go-Live.
- WS3 – Mixed Trials
  - Continue to add more EVs to this trial and capture journey data
  - Continue executing mixed trial experiments
  - Start Trial Period when sufficient vehicles return to the road
- WS4 – IoT Platform, Network Forecasting & Flexibility Analysis
  - Ramp development team up and resume build of trial applications
  - Continued development of platform capabilities
  - Continued development of the analytics solution

  - Begin development of UK Power Networks' ANM system to meet project requirements
  - Procure a supplier for the development of the GSA solution and start development activities
- WS5 – Economic Analysis & Business Models
  - Finalise design of TCO model
- WS6 – Reporting & Deliverables
  - Prepare December 2020 project progress report
- WS7 – Project Management & Sharing Learning
  - Continue to monitor progress in vehicle acquisition and adjust project plan appropriately
  - Manage the re-establishment of the technical team when appropriate
  - Continue to update the project website
  - Guide detailed design process, mobilisation of technical team and detailed planning of analytics solution
  - Support WS1 & WS2 in new participant acquisition
  - Participate in LCNI Conference and LCV event.

4 Progress against budget

Details of project progress against budget is given in Confidential Appendix B.

5 Project bank account

A project bank account statement is included in Confidential Appendix C.

6 Project deliverables

Table 2 summarises the current progress towards completing the project deliverables. To date Deliverable D1 has been published. On 20 February 2020 the project notified Ofgem of a non-material change, delaying the publication of the remaining deliverables by one year. The 'Due Date' column reflects these revised dates. Should it become possible to bring forward the completion of a deliverable the project will endeavour to do so.

Table 2 – Project Deliverables – Showing revised deliverable deadlines communicated to Ofgem as a non-material change on 20 February 2020

Deliverable	Description	Due Date	Status
D1 High level design and specification of the three trials	Report outlining the requirements, use cases, scenarios, technologies and locations for WS1 (Home Charging), WS2 (Depot Charging) and WS3 (Mixed Charging)	30 August 2019	Published
D2 Solution build report – lessons learned	Report setting out the lessons learned from the infrastructure and technology build for the trials. The report will also include a description of the methodology to be used for trials	26 February 2021	Not yet due to start
D3 Learning from installation, commissioning and testing	Report setting out the key learning points from the installation, commissioning and testing processes/activities	27 August 2021	Not yet due to start
D4 Early learning report on the trials	Report setting out how each trial is performing, data gathered, insights gained, changes required	18 February 2022	Not yet due to start

Deliverable	Description	Due Date	Status
D5 Interim report on business models	Interim report outlining the preliminary economic and behavioural findings and high-level options for commercial solutions/business models	13 May 2022	Not yet due to start
D6 Data sets	Final datasets gathered from the trials for dissemination to stakeholders.	18 November 2022	Not yet due to start
D7 Final learning report	A report covering: • A summary of the work undertaken • The insights gained from the trials • Recommendations and likely costs and benefits • Models for use of commercial EV flexibility by DNOs. • Recommendations on business models • How the trials, the infrastructure and technology should be transitioned after the project has completed and How to ensure integration of the Methods with DNO/DSO systems and processes	10 February 2023	Not yet due to start
Comply with knowledge transfer requirements of the Governance Document	1. Annual Project Progress Reports which comply with the requirements of the Governance Document 2. Completed Close Down Report which complies with the requirements of the Governance Document Evidence of attendance and participation in the Annual Conference, as described in the Governance Document	N/A	2019 report published. This report forms part of this requirement for 2020 Item 2 is not yet due to start

7 Data access details

It is recognised that innovation projects of this nature may produce network and consumption data, and that this data may be useful to others. This data may be shared with interested parties whenever it is practicable and legal to do so and it is in the interest of GB electricity customers. When such data is available the project will provide access to non-personal, non-confidential/non-sensitive data on request, in line with UK Power Networks' Innovation Data Access Policy:
https://innovation.ukpowernetworks.co.uk/wp-content/uploads/2019/11/UKPN-Innovation-Data-Sharing-Policy-7-Nov-19.pdf

As part of deliverable D6, the project plans to make a comprehensive dataset resulting from the trials openly available.

8 Learning outcomes & dissemination

Optimise Prime is committed to sharing learnings with a wide group of stakeholders in order to help accelerate the EV transition. There have been a number of learning outcomes to date, which have been identified throughout the Project Progress Reports and in the project's first deliverable.

Optimise Prime continues to maintain the project website www.optimise-prime.com, together with the project LinkedIn account https://www.linkedin.com/company/optimiseprime, providing periodical updates to interested stakeholders.

Together with Project Charge, an NIC Project run by SP Energy Networks focused on public charging infrastructure, Optimise Prime ran the 'Changing Lanes' webinar on 23 April 2020. The session was attended by 118 people from a range of organisations and covered topics including progress on developing the depot planning model and profiled connection products. The presentations from this session can be found at https://www.optimise-prime.com/news/changing-lanes.

Figure 8 – Changing Lanes Webinar held on 23 April 2020

Project Partners have continued to represent the project at a number of events and activities throughout this reporting period:

- Freight Transport Association's Greater London Freight Council – UK Power Networks presented Optimise Prime (January 2020)
- UK Power Networks' Net Zero Networks Forum – UK Power Networks and Hitachi representatives presented an update on progress in delivering Optimise Prime (March 2020)
- New steps for energy systems integration – IEA/Agora Energiewende Webinar – Hitachi presented update on the project (April 2020)
- Published article in Hitachi Review outlining the project and its expected benefits
- Royal Mail promoted the project through its press release marking the introduction of new EVs in London.

Figure 9 – Optimise Prime Programme Manager and Innovation Lead present to UK Power Networks Net Zero Networks Forum, 11 March 2020

9 Intellectual Property Rights (IPR)

This section lists any relevant IP that has been generated or registered during the reporting period along with details of who owns the IPR, any royalties that have resulted (Table 3), and any relevant IPR that is forecast to be registered in the next reporting period (Table 4).

Table 3 – IP generated last period (January – June 2020)

IP Description	Owner(s)	Type	Royalties
Prototype Depot Planning Model – updated version	Hitachi, UK Power Networks	Relevant foreground IPR	Nil

Table 4 – IP forecast next period (July – December 2020)

IP Description	Owner(s)	Type
Profiled Connection Agreements – requirements approach & definitions	Hitachi, UK Power Networks, SSEN, Royal Mail	Relevant foreground IPR
Total Cost of Ownership Model – High level design	Hitachi, UK Power Networks, Royal Mail	Relevant foreground IPR

10 Risk Management

Table 5 lists the risks highlighted in the FSP as well as new risks that have arisen during the reporting period. This table describes how the project is managing the risks and the potential impact on project delivery.

Since December's PPR the project has identified risks R048 to R050. The project continues to monitor risks and issues through regular risk management meetings. Following each meeting risk impacts and mitigation plans are updated. Seven risks have been closed over this period, either due to the risk passing, or to avoid duplication of risks in the log. Risks closed in previous reporting periods are omitted.

Table 5 – Project Risk Log

ID	Name	Risk Description	Mitigation	Impact on Cost	Probability	Impact on Schedule	Status	Owner	Last Review	Closure
Project Name: Optimise Prime										
R001	Project costs are higher than expected	Project overspend requiring additional Partner contribution or request to Ofgem for additional funding	- Budget completed in 2018 and submitted in the FSP - Budget updated in November 2018 for contracts - Budget is updated each month for actuals and new forecasts, with a new baseline every quarter. - 20/02/2020 – Project extended 364 days within current budget, project consortium will explore all available options to mitigate any further extension and the associated impact on budget	High	High	Negligible	Open	PM	22/05/2020	
R002	Some aspects of the technical solutions are not achievable to the desired specification within the project budget	The project will not be able investigate all of the available techniques	- 14/06/19 An agile method is planned to be used. The exact method used will be flexed according to budget and time available in order to achieve the project scope.	High	Low	Low	Open	TDA	22/05/2020	
R003	Solution design and implementation is more complex than initially thought	Potential over-spend on solution development	- 14/06/19 An agile method is planned to be used. The exact method used will be flexed according to budget and time available in order to achieve the project scope. - 25/11/19 – New partners may not use CPC, requiring integration with third party systems	High	Low	High	Open	PM	22/05/2020	
R004	Solution does not deliver anticipated outcomes	Lower than expected value delivered	- Trials design agreed on 07/06/19. - Trial and solution design is clearly defined following set methodology clearly linking activities with outcomes. Designs are agreed with relevant Partners and linked to FSP commitments. - Solution design and business case regularly reviewed throughout the project lifecycle and changes are made where needed - Review of each Deliverable by UK Power Networks prior to submission to Ofgem to ensure the solution delivers the outcomes - 25/11/19 Independent assessor has not raised issues with trials/solution design - 22/05/20 – Imperial College review supports statistical significance of the trial methods to meet learning objectives	Negligible	Low	Negligible	Open	PM	22/05/2020	
R005	Partner performance is not contractually defined	Outputs delayed or inadequate and potential overspends	Weekly meetings with Project Partners, Suitable incentives where required Shared responsibilities for deliverables Contracts signed on 18/03/19 Partner remain committed and performance is tracked by weekly meetings and programme governance	Medium	Low	Medium	Open	PM	22/05/2020	

ID	Name	Risk Description	Mitigation	Impact on Cost	Probability	Impact on Schedule	Status	Owner	Last Review	Closure
R006	Suitable equipment suppliers cannot be found	Project will be delayed or require re-scoping	Realistic requirements specified at FSP. Early consultation with suppliers. 10/06/19 Hitachi have selected their suppliers and Royal Mail have selected CP provider and is testing a new telematics system. Changed to Low Risk 22/04/20 – Made negligible as do not see need for more suppliers/equipment at this time	Low	Negligible	High	Open	PM	22/05/2020	
R007	It is not possible to test equipment adequately prior to commencing the trial	Project may need to be re-scoped	Good understanding of supply chain. Realistic requirements specified at FSP. 12/03/20 – Hitachi pilot site installed and ready for testing	High	Low	Medium	Open	PM	22/05/2020	
R009	Partner or supplier may withdraw from project	Partner or supplier needs to be replaced. Partner or supplier withdrawals resulting in new technology or equipment having to be purchased.	14/06/19 Working group established on 03/05/19 to find new participants for the home fleet Weekly status reports with the Partners, and quarterly governance meetings to assess performance. Do not expect any existing partner to withdraw	Medium	Medium	High	Open	PM	22/05/2020	
R010	Suitable sites for trials not available	Demonstrations and trials cannot proceed	10/06/19 – Royal Mail have target list of 21 sites for Trials A and B 05/09/19 – Seven sites agreed for RMG Trial A. 12/03/20 – RMG won't run trial B sites, suitable sites will need to be identified with new trial participants if secured 22/04/20 – Centrica will roll out vehicles throughout GB that may be able to join trials	Medium	Medium	High	Open	PM	22/05/2020	
R012	Changes to key personnel	Project delays due lack of availability of personnel for key roles/loss of knowledge	Ensuring project progress, systems, processes and learnings are well documented in a timely way to prevent loss of knowledge caused by staff changeover.	Low	Low	Medium	Open	PM	22/05/2020	
R013	Specification and build of trials and technology solution takes longer than planned	Project delays	Trials design agreed on 07/06/2019. 27/06/19 – Technical Delivery plan created, close collaboration with Development team in Lisbon set up. 14/10/19 – Planning work completed in September 2019, regularly revise based on progress 12/03/20 – Tech team rolled off. Resumption dependent on fleet progress 22/05/20 – Deliverables delayed to accommodate delayed technology build	Medium	High	Medium	Open	TDA	22/05/2020	
R016	Major issues with equipment causing damage to network or causes injuries	Equipment is damaged or individual is injured	Analysis of this potential is carried out early in the project and recommendations are incorporated into the design. 22/04/20 – Pilot site in place, insurance in place, no issues to date & minimal risk – change to negligible	High	Negligible	Low	Open	Trial Operations PM	22/05/2020	

ID	Name	Risk Description	Mitigation	Impact on Cost	Probability	Impact on Schedule	Status	Owner	Last Review	Closure
R017	Depot Partner may change their plans for the timing of the roll out of EVs and infrastructure	Re-planning and potential for project delays. Potential cost of on boarding new participants. Centrica EV procurement delayed. Royal Mail no longer procuring Trial B vehicles.	Work with Partners in the early stages to ensure plans are realistic and build in contingency. Project will work with Hitachi Capital and new participants to endeavour to meet the volumes. 22/05/20 Discussions with participants has slowed as a result of COVID-19. Deliverables delayed and project evaluating number of EVs needed for statistically significant results. Stage Gate process in place to manage	Medium	High	High	Open	PM	22/05/2020	
R019	Delays to the procurement and installation of infrastructure	Delays to the start of the trials	Plan procurement and installation as early as possible. Identify alternative suppliers if delays are likely. Monitor supply chain. Early discussion between the Partners and car manufacturers to secure sufficient number of EVs. 22/04/20 – all equipment except load/connection monitoring in place for WS2 Trial A. Commissioning and WS1 progress paused by COVID-19. 22/05/20 Measures now in place to resume work safely.	Low	Negligible	High	Open	PM	22/05/2020	
R020	EV Subsidies are curtailed earlier than forecast	EV rollout slows and business case affected. BEV congestion charge discount ends Dec 2025	Closely monitor legislative proposals with OLEV. Lobby where necessary. 12/03/20 – discussion held with TfL re. congestion charge impacts 22/05/20 – TCO model being updated to reflect current subsidy environment	High	High	Low	Open	PM	22/05/2020	
R022	Legislative changes	Legislative changes mandate project methods or make them illegal by mandating alternative methods. Project business case is not achievable	Closely monitor legislative proposals with OLEV. Lobby where necessary.	High	Low	Low	Open	PM	22/05/2020	
R024	Ofgem ability to Halt the Project (Cancellation)	Ofgem may halt the project in certain circumstances e.g. because it has become clear that the Method is not viable or there are other reasons why it is not efficient, or not possible to continue with the project. Ofgem will identify Halted Project Revenues; funds received by Funding Licensee which have not yet been spent (less funds to halt the project).	Critical to keep accurate and up to date records of expenditure and evidence of committed funds. Project is continuously reviewing circumstances, assessing risks and impact, preparing different options and involving Project Board in decision making	High	Low	Negligible	Open	PM	22/05/2020	

ID	Name	Risk Description	Mitigation	Impact on Cost	Probability	Impact on Schedule	Status	Owner	Last Review	Closure
R029	WS1 – EV targets are not met	Potential that WS1 is unable to meet EV targets due to factors outside Project control, EU CAFE regulations place obligations on vehicle OEMs that may encourage them to delay new ultra-low carbon LCV launches into 2020 Centrica original EV purchasing timeline delayed,	Project will work with Hitachi Capital and new participants to endeavour to meet the volumes. Stage Gate process in place to manage project spend if EV volumes are ahead of, at or behind target 30/04/19 Fortnightly meetings taking place 14/06/19 – Draft Strategy produced and a list of target potential participants being pursued. 29/11/19 – Targeted spend option chosen to give time for vehicle procurement 22/05/20 – Considering Centrica fleet cars, out of area EV vans to supplement trial as a mitigation; Exploring number of vehicles required for statistically significant results	High	High	High	Open	PM	22/05/2020	
R030	WS3 – EV targets are not met	Potential that WS2 is unable to meet EV targets due to factors outside Project control, e.g.: Vehicle availability, TCO Issues, individual drivers' choice -Uber issued 2-month licence extension by TfL 24/09/2019 -TfL revoked Uber's Licence 25/11/2019	Uber vehicle growth on target 25/11/2019 – Uber are appealing decision of TfL not to grant license in London. Continuing to operate until appeal decided – See R047 22/04/20 – Number of EVs on road has declined due to COVID-19 lockdown. In other geographies journey numbers have quickly recovered – continuously monitoring number of EVs on road	High	Medium	High	Open	PM	22/05/2020	
R031	WS2 – EV target not met	Potential that WS2 is unable to meet EV targets due to factors outside Project control, e.g.: Vehicle availability, TCO Issues, change in corporate strategy 12/03/20- RMG no longer expect more vehicles in FY2020/1	Work with Partners in the early stages to ensure plans are realistic and build in contingency. Project will work with Hitachi Capital and new participants to endeavour to meet the volumes. Stage Gate process in place. New trial participant on-boarding work begun 29/11/19 – Targeted spend option chosen to give time for vehicle procurement 22/04/20 – all 220 Trial A vehicles on road 22/05/20 – Exploring number of vehicles required for statistically significant results	High	High	High	Open	PM	22/05/2020	
R032	Home aggregator unable to implement flex services integration as developed for Depot	Flexibility services will be developed initially for Depot controller and extended to domestic aggregation. Additional integration effort or changes may be required.	27/06/2019 Requested plan of home aggregation work. Discuss flexibility for home trial early to design in any required integration. 23/09/2019 – Received plan & Architectural design work started 22/04/20 – Closed and merged with R41 to eliminate duplication	Medium	Low	Medium	Closed	TDA	22/04/2020	22/04/2020

ID	Name	Risk Description	Mitigation	Impact on Cost	Probability	Impact on Schedule	Status	Owner	Last Review	Closure
R033	Profiled connection agreement level of innovation	UK Power Networks definition of a profiled connection as adherence to a single flat constraint level may not be innovative enough to satisfy Ofgem's requirements, potentially requiring revisions to experiment design	Work with RMG to enable the experiments to explore more complex profiles, without impacting on UK Power Networks' legal responsibilities UK Power Networks' PM is following up with connections team to understand whether more detailed profiles will be available in future. 12/03/2020 – Closed – following review by UK Power Networks and SSEN it has been agreed that the design will go to granularity of 48 half-hourly time-steps which aligns with the experiment design.	Medium	Low	Low	Closed	Trial Design PM	12/03/2020	12/03/2020
R035	RMG Mount Pleasant depot deployment	Full deployment of Mount Pleasant may not be completed by the end of October due to complexities of ongoing building work and RMG requirements.	10/07/2019 - Monitor installation progress to assess risk of all Trial A EVs not being deployed 14/10/2019 - Mount Pleasant expected to be complete by January 2020 (all EVs on road) 12/03/20 – Closed Mount Pleasant complete	Negligible	Low	High	Closed	RMG PM	12/03/2020	12/03/2020
R036	Ability to measure depot load at Royal Mail sites	Not yet clear how project will measure the site load at Royal Mail depots.	10/7/2019 Several options – feasibility being explored. Site dependent 14/10/2019 – Candidate solution being investigated. 12/03/20 – Load monitoring ordered and site surveys done. Awaiting install	Low	Low	Low	Open	Trial Operations PM	22/05/2020	
R037	Data Comms Solution - RMG Network connection process not yet known.	Project does not yet have a data comms solution for RMG depots.	Agreement for generic comms design and ADSL lines ordered. 14/10/2019 All lines ordered, waiting on quote for broadband backhaul cost. 25/11/20 – All lines installed – closed	Low	Low	Low	Closed	Trial Operations PM	25/11/2019	25/11/2019
R038	Acceptance test site and depot sites will not be exactly the same	Likely differences in network, exact CP, scale and ability to test user interfaces effectively.	05/09/19 CPs and back office will be identical, EVs will not, so some tests may need to happen of RMG site with RMG van prior to live use. 12/03/20 – Strategy to test at test site then at one depot before wider rollout	Low	Low	Low	Open	Trial Operations PM	22/05/2020	
R039	Method of counting number of Uber vehicles on the road	Uber report number of vehicles on an 'active in the past week' basis. Although Uber may start the trial with sufficient vehicles, it is possible that the number reported will drop (e.g. for holidays) and that the same vehicles aren't tracked for a full year.	Develop a consistent method of counting number of Ubers in trials that respects the unpredictable nature of their vehicles. It is useful to show the unpredictability in the data 12/03/20 Closed – project will report number of vehicles that are on the app each month.	Low	High	Low	Closed	PM	12/03/2020	12/03/2020

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R040	Unable to meet the evidence criteria for Ofgem Deliverables D2 & D3 in current timeframe	The evidence for D3 "Report setting out the key learning points from the installation, commissioning and testing processes/activities" is due on 28/08/2020. Trial Period delayed to 01/10/20 creating risk that all learnings may not be captured to meet the evidence criteria by this time. Same issue with D2.	11/09/19 – Work with Partners to make them aware of the requirements for D3. Ensure the progress of each trial is monitored and all key learnings are captured as activities are progressing. D3 can be delayed by up to one year without being a material change. 14/10/19 – Likely that D2-7 will be delayed while EV numbers are confirmed 29/11/19 – Delay agreed at board meeting, re-planning to take place 20/02/20 – Ofgem informed of change, will continue to monitor in case of further challenges	Low	Medium	Medium	Open	PM	22/05/2020	
R041	Lack of coordination for integrating UK Power Networks systems with Hitachi IoT platform and home aggregation platform	There is currently no dependency built in to the programme plan with regards to integration of the different systems/platforms that are being developed by the Partners. There is a risk that if a development of a particular system/platform is delayed it could potentially have an impact on the start of the trial.	11/09/19 – Work with Partners to build the key dependencies into the overall programme plan and track progress 23/09/19 – Identifying resource requirements for integration and testing of project systems and infrastructures. 14/10/19 Dialogue ongoing between Hitachi, UK Power Networks and Centrica. 12/02/20 – Draft plan completed for discussion – UK Power Networks planning ANM developments 22/04/20 – Further flex meetings with Centrica. R32 merged to remove duplication. 22/05/20 ANM systems vendor carrying out work to capture detailed requirements for integration of the partner systems	Medium	Medium	Medium	Open	PM	22/05/2020	
R042	Trialling of profiled connections in network congested areas posing network security risk	Trialling profiled connections for a site connected to a congested area of the network could pose a network security risk due to breach of the agreed profile.	11/09/19 – Carry out trials of profiled connections in a safe environment, i.e. at sites that are within their agreed capacity, setting the agreed profile lower to ensure a breach does not lead to network security risk and ensure a simulation exercise is carried out to assess the risk.	Low	Low	Medium	Open	UK Power Networks PM	22/05/2020	
R044	DPlan rollout delay to EPN/SPN	Profiled connection assessments using existing planning tool cannot be carried out for Depot sites in EPN/SPN area as DPlan is not yet rolled out. There is a risk that additional cost and time will be required to build the network in these areas using DPlan.	Limit the Royal Mail profiled connection trial sites to LPN. Investigate the cost/time of developing SPN sites in DPlan on an ad hoc basis. (16/09/19). Escalated to Head of Innovation 12/03/20 – SPN DPlan part of UK Power Networks BAU activity, low dependency for project trials	Medium	Low	Medium	Open	UK Power Networks PM	22/05/2020	
R045	EV Volume Risk to project	The existing Partners are unlikely to provide the volume of vehicles required for WS1 and 2 in the original project timeline. Potential impact to validity of learnings.	Working group has active conversations with new participants with at home and at depot vehicles. Considering extending project pending vehicle availability Slowing development work in order to allow extended or paused programme. 22/04/20 – Participant talks in progress but disrupted by COVID-19 issues. Considering additional out of area EVs as well as well as the number of vehicles required for statistically significant results	High	High	High	Open	PM	22/05/2020	

ID	Name	Risk Description	Mitigation	Impact on Cost	Probability	Impact on Schedule	Status	Owner	Last Review	Closure
R046	Delay in acceptance/analysis of WS3 data	Accepting WS3 data has taken longer than anticipated	Hitachi has implemented a solution to accept and analyse data while main container platform configuration and testing is completed 10/02/20 – Closed – Data has been accepted	Low	Medium	High	Closed	Platform PM	10/02/2020	10/02/2020
R047	Uber licensing decision	Transport for London has announced that it will not renew the PHV Operator license of Project Partner Uber	Uber is working closely with TfL, is appealing the decision, and will continue to operate in London during the appeal process A significant amount of data has been, and continues to be, collected from Uber EVs. New trial participant process will be extended to WS3 if Uber loses ability to operate in London	Medium	Medium	Medium	Open	PM	22/05/2020	
R048	VPN connection with RMG depot CPO back office/unable to smart charge	VPN connection is required to provide a secure connection between the iHost system RMG CPO provider to enable smart charging controlled by CPC. Slow setup may delay WS2.	Escalated to RMG and suppliers 02/03/20 – Closed – Issue is resolved and communication is working	Low	High	Medium	Closed	Trial Ops PM	02/03/2020	02/03/2020
R049	Potential changes to partner back office systems	Level of M&A activity in the segment may result in changes to CPO back office suppliers requiring more integration work	Talking to a number of CPOs as part of new participant discussions. 22/05/20 – Monitoring situation.	Low	Low	Low	Open	Design Auth.	22/05/2020	
R050	Coronavirus/COVID-19	Spread of Coronavirus may result in business disruption to project partners and/or supply chain issues. Potential delays to project from significant time off work for project members. Further delay to EV delivery and participant discussions will impact development ramp-up, Trial Period and deliverables.	Partner companies and employees to take reasonable precautions including ability to work from home as required. Partners were asked at the board meeting on 03/03/20 to report if any issues were identified that could impact the project. No direct impacts were identified at that point 16/03/20 – Uber raised risk of lower demand slowing change to EV in immediate term. Some vehicle manufacturers, e.g. Peugeot have suspended production which may have knock on effects on EV delivery. Social distancing may disrupt partner or other discussions. 07/04/20 – Site works suspended. Centrica warn that lead time on vehicles likely to extended and other works delayed. 22/05/20 – Centrica EV order delayed and new participant discussions paused. Project has informed Ofgem of issues and is exploring options such as investigating the number of EVs needed for statistical significance to ensure the project delivers expected learnings	High	High	High	Open	PM	22/05/2020	

11 Material change information

No material changes have been encountered during this reporting period and none are foreseen for the next reporting period.

12 Other

There is no other information to report to Ofgem.

13 Accuracy assurance statement

The project has implemented a project governance structure as outlined in UK Power Networks' innovation policies and procedures. All information produced and held by the project is reviewed and updated when required to ensure quality and accuracy. This report has gone through an internal project review (and a further review within UK Power Networks) to ensure the accuracy of information.

UK Power Networks hereby confirm that this report represents a true, complete and accurate statement on the progress of the Optimise Prime project in its first twelve-month reporting period and an accurate view of UK Power Networks' understanding of the activities for the next reporting period.

Signed 

Name ……Suleman Alli …….

Position ……Director of Strategy & Customer Services

Date ……15 June 2020…….