



**NIC Project UKPNEN03**

**Project Progress Report**

**December 2021**



Optimise Prime



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## Table of acronyms

| Acronym | Full form   |
|---------|---|
| ANM     | Active Network Management   |
| API     | Application Programming Interface                                       |
| CAFE    | Clean Air for Europe  |
| CP      | Charge Point  |
| CPC     | Charge Point Controller   |
| CPO     | Charge Point Operator   |
| CSMS    | Charge Station Management System  |
| DNO     | Distribution Network Operator   |
| DSO     | Distribution System Operator  |
| EV      | Electric Vehicle  |
| FSP     | Full Submission Pro-forma   |
| GB      | Great Britain   |
| GSA     | Geospatial Analytics  |
| IoT     | Internet of Things  |
| IP(R)   | Intellectual Property (Rights)  |
| IT      | Information Technology  |
| LCV     | Light Commercial Vehicle  |
| LV      | Low Voltage   |
| LPN     | London Power Networks plc (one of UK Power Networks' three DNOs)        |
| NIC     | Network Innovation Competition  |
| OTA     | Over-the-Air  |
| OZEV    | Office for Zero Emission Vehicles                                       |
| PH(V)   | Private Hire (Vehicle)  |
| PM      | Project Manager   |
| POC     | Point of Connection   |
| PPR     | Project Progress Report   |
| RAID    | Risks, Assumptions, Issues and Dependencies                             |
| RMG     | Royal Mail Group  |
| SFS     | Strategic Forecasting System  |
| SGS     | Smarter Grid Solutions  |
| SPN     | South Eastern Power Networks plc (one of UK Power Networks' three DNOs) |
| SSEN    | Scottish & Southern Electricity Networks                                |
| TOA     | Trials Operational Applications   |
| TCO     | Total Cost of Ownership   |
| UK      | United Kingdom  |

## Glossary of terms

| Term         | Definition  |
|--------------|---|
| Trial Period | A 12-month period of trialling for each workstream when the minimum quantity of 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  |
| Product A    | A firm forward option flexibility product, procured in advance  |
| Product B    | A day-ahead spot market flexibility product   |
| Product C    | An intraday balancing flexibility product   |

# 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, SSEN, Hitachi Europe and Hitachi Capital.

The project is gathering data from over 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 Great Britain's (GB) 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 is seeking 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 fifth Project Progress Report (PPR) for the Optimise Prime Network Innovation Competition (NIC) project, covering the six-month period between 19 June and 8 December 2021. This document, together with the [previous six-monthly report from June](#), fulfils the reporting requirements of Sections 8.11 – 8.15 of v3.0 of the NIC Governance Document for 2021. 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 made good progress in the last six months, with all three trials now underway. Workstream 1 (WS1), the return to home trials involving Centrica's British Gas fleet, and Workstream 2 (WS2), the depot charging trials involving the Royal Mail fleet, began on 1 July 2021 once the minimum number of vehicles were on the road and the means to capture data from them was in place. Project systems are now completed and in operation, and the initial trials of the flexibility and profiled connection products have taken place.

Over this period, the project has successfully:

- Exceeded the minimum required number of vehicles in all trials, and started the final two trials on 1 July 2021
- Collected data and carried out initial trial experiments and data analysis in WS1, 2 and 3
- Completed the development and testing of the project's flexibility solution, including developments to UK Power Networks' Active Network Management (ANM) system and the integration of Flexibility Service Provider solutions for the WS1 and WS2 fleets
- Carried out a series of flexibility and profiled connection trials
- Analysed the responses to behavioural questionnaires posed to drivers and fleet managers and began a second round of surveys
- Published [Deliverable D3](#), documenting the installation, commissioning and testing phase of the project
- Managed the project, its risks and finances.

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 WS1, Centrica placed an order for 1,000 Vauxhall Vivaro-e vans in July 2020. While the rollout of vehicles has taken longer than anticipated, the company is continuing progress at rolling out vehicles and installing the required charging infrastructure at drivers' homes. The minimum target of 300 vehicles has been surpassed, with the full order of 1,000 expected on the road in early 2022. Centrica is sharing charger and telematics data regularly with Hitachi, based on which analysis for the trials is ongoing.

Work on integrating the charge points, the Centrica flexibility platform and UK Power Networks' ANM has taken place during this period. A delay in delivering these systems was experienced, but the experiments have been re-profiled in order to deliver the required learnings within the trial period. The first set of flexibility trials took place during October and November 2021 and the results are being analysed.

In WS2, around 300 EVs are now operating from nine Royal Mail sites. The addition of the eighth and ninth depots at Camden and Victoria, using an alternative 'Over-the-Air' communications method was successful and this communications system has been extended to cover Swarco chargers at other depots.

A significant focus of the data analysis team has been ensuring there is full reconciliation of the charge point (CP), EV and site load data, and using this data as a basis for trials analysis and creating bids for flexibility.

The Royal Mail sites in WS2 have participated in trials of both Profiled Connections and Flexibility products A and B. Analysis of the results of these experiments is ongoing, however there have been some encouraging results in some of the depots. The ability to baseline demand accurately has been identified as a key determinant of how successfully the sites can provide flexibility to the distribution network operator (DNO).

The web based 'site planning tool' has undergone some minor additional development following feedback and can now be found on the project website at [www.optimise-prime.com/site-planning-tool](http://www.optimise-prime.com/site-planning-tool).

In WS3 (the Mixed Trials utilising Uber trip data from London-based EVs), Uber has continued to collect and anonymise trip data from EVs on their platform, while UK Power Networks and SSEN have been collating utilisation data of their secondary substations throughout Greater London. Hitachi data scientists have continued to develop models to estimate charging demand and its potential impact on the distribution networks and have updated the models to manage the increasing numbers of EVs being analysed.

At the time of writing, the Optimise Prime partners have over 4,000 EVs on the road. 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 platform team transitioned from development to an ongoing support role. Activity continued to finalise the testing of the flexibility systems and make improvements to systems where issues were found.

UK Power Networks continued to work with Smarter Grid Solutions (SGS) to complete the development and testing of the ANM functionalities required for Optimise Prime trials WS1 and WS2 and to begin creating tenders for and dispatching flexibility as part of the WS1 and WS2 trials.

Work began between Hitachi and UK Power Networks to identify how the data gathered in the Optimise Prime trials can be fed into the UK Power Networks Strategic Forecasting System in order to quantify the potential cost and capacity impacts of commercial EV growth and the Optimise Prime methods.

### **1.3.3 WS5 – Economic Analysis & Business Models**

The Economic Analysis & Business Models workstream has continued to develop and detail the Total Cost of Ownership (TCO) model, developed an operating model for the electrification of fleets and has analysed the results of a series of surveys of partner drivers and managers regarding behavioural factors impacting upon the EV transition. The initial results from these activities will be published in Deliverable D5.

### **1.3.4 WS6 – Reporting & Deliverables**

[Deliverable D3](#), detailing installation, testing and commissioning was published in August 2021. Work is in progress to deliver Deliverable D4, reporting initial learnings, and Deliverable D5, focused on business models.



### 1.3.5 WS7 – Project Management & Sharing Learning

The project management function has continued to manage Optimise Prime's project plan, budget, and resources throughout this reporting period.

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

Despite the disruption caused by the COVID-19 pandemic, the programme has continued with a programme of knowledge exchange activities, as detailed in section 8.

## 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 the project has moved from the solution development stage into the trials phase, the risk profile has changed. The vehicles and systems to run the trials are in place, the focus of risks turns to potential interruptions to trials. Key risks and issues being managed during this period include surround some aspects of the Optimise Prime solution that were not fully complete at the start of the trial period, including:

- The delay to the delivery of the flexibility systems, which were completed in October 2021 and are now in use
- Issues with CP control in WS1, which is continuing to delay some flexibility experiments
- Delay to the implementation of some load monitoring systems, due to physical and contractual constraints.

These are being monitored and mitigated and, while they have impacted internal project costs and timelines, it is not currently expected that they will result in further delay to project completion or overspend of the project budget.

## 1.5 Project Learnings

The testing and commissioning work that has taken place in WS1 and 2 created a number of learnings regarding the impact of technical and behavioural factors on the design and implementation of smart charging regimes. These were published in [Deliverable D3](#) in August 2021 and cover important considerations to take into account when implementing both depot charging and flexibility services.

The WS1 trials have shown that aggregation of demand response from distributed EVs can be technically achieved, though allowances need to be made regarding the number of EVs available to take account of constraints such as unplanned unavailability. Analysis of data has predicted that unmanaged charging of the Centrica fleet is likely to result in a peak in charging demand between 17:00 and 20:00, coinciding with peaks in household demand on the electricity network. Smart charging could have a significant impact on power demand, however the type of smart charging implemented needs to be chosen carefully to avoid creating higher peaks at different times.

In WS2, simulations of smart charging based on ICEV data showed that peak load minimisation and cost minimisation could be achieved at Royal Mail depots. Smart charging schedules could yield cost savings for Royal Mail and other depot-based fleet operators by managing charging load to avoid peak energy cost times and reducing connection costs. The same technique should also alleviate pressure on the distribution network at times when it is most constrained. Trials of the profiled connection systems are at an early stage but have

shown that it is possible to control overall load in line with a profile at some sites through the use of EVs. There is likely to be a need for a minimum volume of EV load, in proportion to background site load, for the EV load to be able to be controlled without background load breaching the profile.

The WS3 trials have estimated the time, location and magnitude of PH EV charge events from Uber trip data, enabling the identification of a number of locations where drivers have to travel a significant distance in order to charge. Modelling has shown that, based on use of optimal CPs by the drivers, the most popular CPs in London are utilised way beyond their capacity, suggesting drivers will have to queue in order to charge when they are at their busiest, or travel further in order to use non-optimal CPs. Over the period of the trials consistent growth has been seen in both the capability of vehicles in the mixed trials and the availability of charging infrastructure. Both of these are likely to have a material impact on future charging requirements.

Initial learnings from the three trials will be published in Deliverable D4.

Optimise Prime continues to generate learnings with regards to the factors that are driving and influencing the EV transition for commercial fleets, and early analysis of project data has also generated learnings with regards to the utilisation patterns of partner fleets. 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

The project has made significant progress during this reporting period and is currently on track to meet the timelines and has successfully commenced all three trials:

- WS3 trials started in August 2020 and continue while the WS1 and 2 have started in this reporting period on 1 July 2021. Data is being captured and analysed across all trials
- The execution of experiments continues in each of the three trial workstreams and the outcome of work carried out so far will be published shortly in Deliverable D4
- The systems required for testing flexibility services within the trials have been completed and used to run the first executions of flexibility
- A trial of profiled connections has taken place at the Royal Mail Depots
- The Site Planning Tool web app has been introduced to UK Power Networks' connections team and updates have been made based on user feedback
- The business model workstream has made progress in analysing responses of surveys of drivers and fleet managers and developing TCO and operating models that will be presented in Deliverable D5
- [Deliverable D3](#), detailing the installation commissioning and test phase of the project has been published
- The project partners have continued to promote the project through publications and events.

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 were held on 23 June and 5 October 2021.

In addition, a regular project progress reporting process has been put in place between Hitachi Europe, Hitachi Vantara, Royal Mail, Centrica, and UK Power Networks, and a monthly meeting with Uber and SSEN. 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, as shown in Figure 1. During this period, the Trials Operational Applications (TOA) development team has been scaled down as it has transitioned from development to a support role. The trials/data science and business models teams have been boosted as the focus of the project turns to trial execution and data analysis. The project manager for UK Power Networks has changed in this period due to internal reorganisation and the handover was completed successfully.

# Optimise Prime Project Organisation Chart

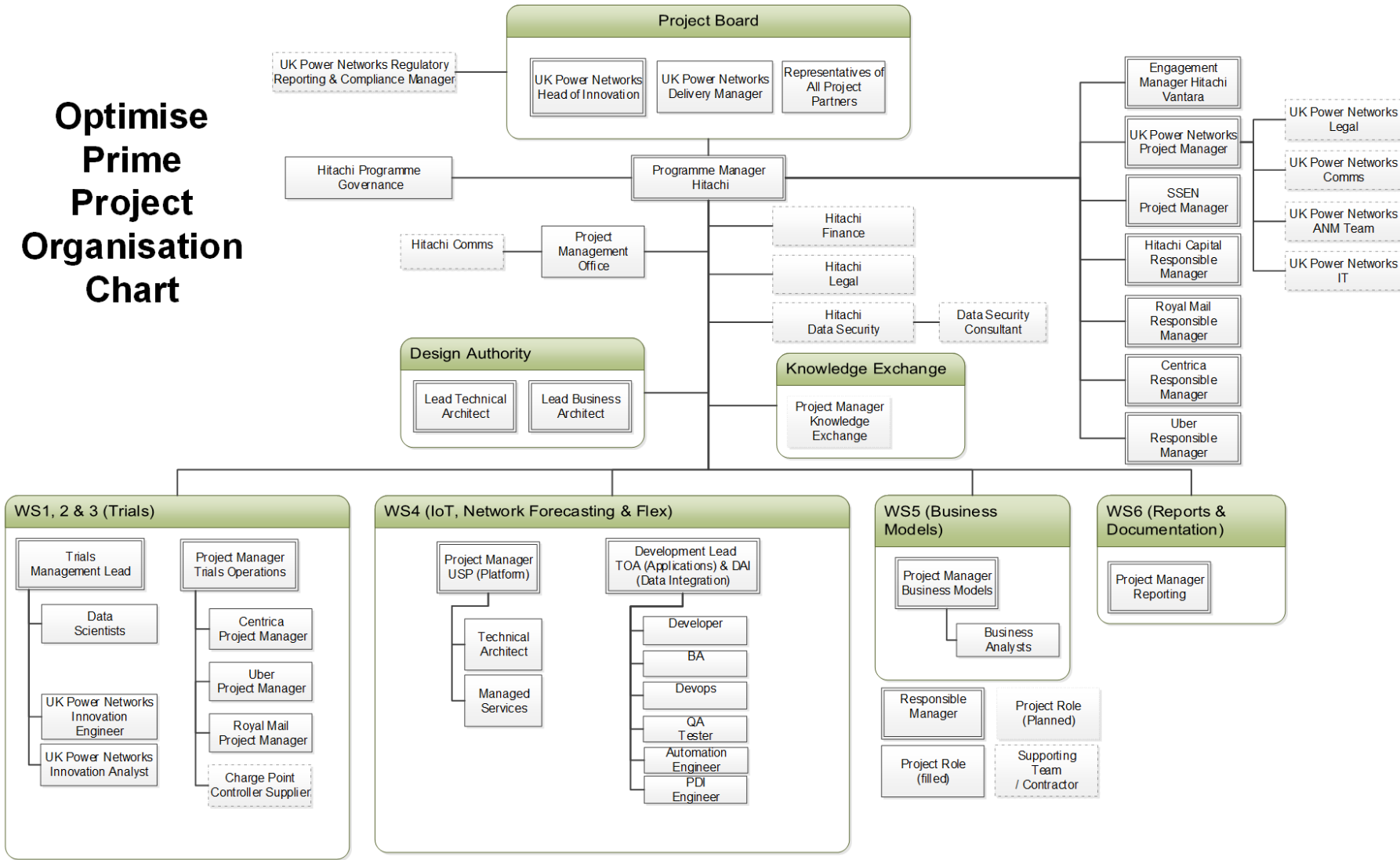


Figure 1 – Optimise Prime Organisation Chart

## 2.2 Workstream progress

### 2.2.1 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.

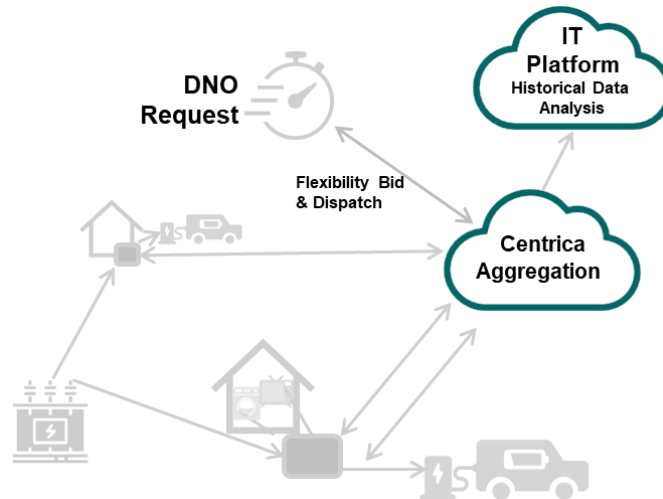


Figure 2 – Schematic of WS1 trial

#### 2.2.1.1 Progress in this reporting period

In the home trial, Centrica has progressed the following activities:

- **EVs** – Continued to roll out an order for 1,000 Vauxhall e-Vivaros to be used by British Gas throughout the UK. The minimum volume of 300 was met before the trials began in July 2021 and there are now over 600 vehicles on the road. The full roll out is expected to complete in early 2022.
- **CPs** – Continued the installation of EV charging infrastructure at drivers' homes, installing devices at over 550 locations. A number of EVs are temporarily utilising public CP infrastructure awaiting home CP installation, while a small group of EVs will permanently use public CPs as home charging cannot be installed. These vehicles will be monitored through telematics, but will not take part in flex trials.
- **Technology** – Continued to operate a driver app as part of the CP control solution, and to capture data from CPs and vehicle telematics.
- **Flexibility** – Implemented and tested the flexibility service provider solution, including integration with the CP control system and UK Power Networks' ANM. Worked with Hitachi, UK Power Networks and SSEN to set out the flexibility trial plan and run the first events. Ran these flexibility trials with an initial sample of vehicles.
- **Behavioural studies** – Organised staff participation in behavioural analysis surveys.
- **Data** – Provided data from charging and telematics data to Hitachi for analysis purposes.

UK Power Networks has:

- Completed the development and testing of the functionalities required to run flexibility products B (day ahead) and C (intraday) through its ANM system
- Developed the plan for flexibility experiments, together with SSEN, Hitachi and Centrica
- Carried out the first run of flexibility products B and C, including the issuing of tenders, analysis of bids, dispatch and settlement.

Hitachi has:

- Worked with Centrica, UK Power Networks and SSEN to plan the testing of flexibility products in WS1, including timing of events and separation of vehicles into flexible units
- Received and analysed the telematics and charging data, working closely with Centrica in order to reconcile the two datasets and ensure data quality
- Carried out initial analysis on the collected EV data, as well as ICEV data in order to make and verify predictions of load resulting from the electrification of home-based fleets.

SSEN has taken part in the design of the flexibility experiments in WS1, including the design of a process for manual bids and dispatch.

### 2.2.1.2 *Challenges and lessons learnt*

The key challenges faced in this workstream have been related to the delay in delivery of the project partners' flexibility systems. UK Power Networks proposed utilising their BAU flexibility dispatch process, which uses emails for bid and dispatch messages, and carried out some manual tests with the ANM system in order to mitigate any delays. While initial testing was carried out manually in order to prove integration, resource limitations at Centrica, coupled with the potential volume of manual transactions with short response times needed prevented full scale trials being completed with the manual process.

The systems to support WS1 flexibility were completed in early October 2021, although some issues with controlling charge points still persist, which Centrica is working with its suppliers to resolve. The partners have worked together to plan the experiment schedule to ensure it will deliver all required learning. Availability of resources within each of the partners to run the trials has also been a challenge and had to be factored into the planning.

As the design of the trials has progressed, some changes to process have been made versus the original plan for the method, with Centrica as Flexibility Service Provider dealing directly with UK Power Networks' ANM system, rather than through the Hitachi platform. Centrica will also analyse the outcome of the flexibility events. This change should better reflect the operation of a flexibility service provider in a BAU situation and is not expected to have a material impact on trial outcomes. Hitachi will continue to capture the raw telematics and charging data for further analysis.

During this reporting period there have been a number of learnings in respect of WS1, including:

- Aggregation of demand response from distributed EVs can be technically achieved through the system implemented for WS1. In order for the flexibility service provider to ensure that they are able to respond to a flexibility commitment, they will need to make allowances in their tender responses regarding the number of EVs available to take account of constraints such as unplanned unavailability of vehicles and drivers requesting immediate charging due to an urgent operational requirement. ([Deliverable D3](#), section 2.4.3)
- Unmanaged charging of the Centrica fleet is likely to result in a peak in charging demand between 17:00 and 20:00, as the most common time for drivers to end their shifts is between 16:30 and 17:00 and they are likely to plug in their vehicles when they return home. This coincides with peaks in household demand on the network
- Smart charging could have a significant impact on power demand, however the type of smart charging implemented needs to be chosen carefully. Based on modelling, simply shifting the demand later may result in higher peak demand if charging events that were more spread out during the day/evening are shifted to start simultaneously. This could potentially result in a secondary peak in household load when combined

with existing overnight demand. Smart charging that is based on load spreading or balancing over the time the vehicle is plugged in could reduce peaks in EV demand significantly

- Drivers undertaking 'reactive' work, outside of normal hours or schedules have been found to generally drive shorter than average distances, so this mode of work is unlikely to be a barrier to electrification. However, at this stage in the rollout relatively few 'reactive' schedules are being operated by EVs – this may be due to driver perceptions affecting the decision to convert to EV or the seasonality of reactive work.

Further detail on these learnings will be published in the upcoming Deliverable D4.

### 2.2.1.3 Outlook for the next reporting period

During the next reporting period, WS1 will focus on:

- Completing the vehicle and CP rollout
- Continuing capturing trial data
- Continuing the analysis of the telematics and charging data through the trial experiments in order to meet the project objectives
- Running further flexibility trials with different timings, volumes and other variables.

## 2.2.2 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 included the commissioning of the charge control and load monitoring systems, the development of the trial applications and the continuation of pre-trial experiments.

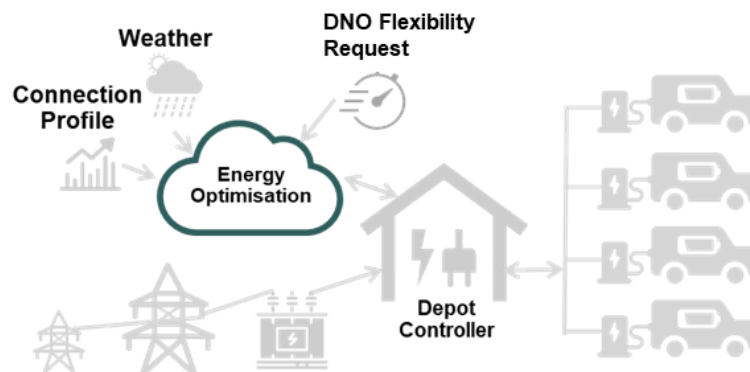


Figure 3 – Schematic of WS2 trial

### 2.2.2.1 Progress in this reporting period

In the depot trial, Royal Mail has:

- Continued to operate their fleet of EVs, adding further vehicles to the trials at a number of depots
- Supported Hitachi in the final testing of the CP control system and the addition of two further depots at Camden and Victoria and in the ongoing operation of the depot optimisation systems
- Contributed to the analysis of the trial experiments
- Organised staff participation in behavioural analysis surveys
- Together with Hitachi and UK Power Networks, developed the plans for the involvement of Royal Mail depots in profiled connections and flexibility products.

Hitachi has progressed the following activities:

- **Depot control and optimisation** – Completed all testing and commissioning the end-to-end depot management systems
- **Depot optimisation** – Operated the depot management systems that capture charging data and implement flexibility products
- **Experiments** – Carried out analysis on data to reconcile charging with telematics and contribute to the answering of the trial experiments and objectives. The initial findings from this will be published shortly in Deliverable D4
- **Profiled connections** – Carried out trials of profiled connections, including the calculation of profiles to trial and the implementation through the optimisation system
- **Depot flexibility** – Completion of the flexibility service provider part of the depot application and the interface with UK Power Networks' ANM system.
- **'Over-the-air' (OTA) charge point control** – In order to add two further depots to the project (and additional CPs at one site where it was not possible to connect using ethernet), it has been decided to develop a modification to the original method in order to trial the sending of control signals to the CPs through the charge station management system (CSMS), rather than on-site Charge Point Controller (CPC) hardware. If this proves successful it may make the method simpler to implement by minimising the need to install additional hardware on site.
- **Site Planning Tool** – Some further user testing and feedback with UK Power Networks' Connection team has led to some minor improvements to the help guide and user interface. The tool can now be found on the project website at [www.optimise-prime.com/site-planning-tool](http://www.optimise-prime.com/site-planning-tool).

Within this reporting period, UK Power Networks has conducted the following activities:

- **Flexibility trials** – following the completion of the modifications to the ANM system, UK Power Networks has coordinated testing of the flexibility products and carried out the first runs of product A in July 2021 and product B in August 2021. UK Power Networks is also responsible for the settlement of flexibility events.
- **Flexibility planning** – worked with all partners to replan the flexibility activities for the remainder of the trials.
- **Profiled connections** – Continued the rollout of the network monitoring solutions required for the profiled connection offering
- **Network impact modelling** – worked with Hitachi and Element Energy to plan how the project will integrate with the Strategic Forecasting System to carry out wider network impact analysis of fleet electrification and define inputs based on project data

Within this reporting period, SSEN has conducted the following activities:

- Worked with the project partners to agree the plan for flexibility experiments
- Carried out the tender and settlement calculation process for some flexibility events.

#### 2.2.2.2 *Challenges and lessons learnt*

A number of challenges were faced in enabling the commissioning and testing of the systems at Royal Mail depots. The following key lessons learnt regarding the implementation of smart charging infrastructure were documented in [Deliverable D3](#) (numbers in brackets refer to sections in that deliverable):

- Where possible, when implementing a smart charging solution, the CPs should be designed/procured together with the control system, to simplify the process of integration, as retrofitting can create significant complexity (3.2.3.1)
- There can be a complex range of actors involved in the provision of depot charging, such as CSMS providers, facility and IT systems maintainers, and it is essential to clearly define responsibilities during both the installation and operational phases (3.2.3.1)

- The use of RFID tags to identify which vehicle is using which charger within a depot is not always reliable, as tags could be swapped, get lost and replaced or drivers may not authenticate the charging session properly. Tighter vehicle and CP integration (where the vehicle itself identifies to the CP) would make optimisation of charging more reliable, simpler to implement and operate (3.2.3.1)
- Power infrastructure at larger and older sites can be complex and require additional time and resources to implement successfully (3.2.3.4)
- There may be a lack of consistent routines/policies for charging vehicles at the end of shift, and these will need to be put in place to enable smart charging (3.2.3.5)
- Different CPs, settings and firmware can result in varying results. This needs to be understood or standardised in order to effectively optimise (3.3.3.1)
- It is not always possible to install point of connection monitoring within distribution network infrastructure and installing on customer premises can be complex (3.4.1)
- There may be a requirement to measure both current and voltage to monitor profiled connection adherence and measuring voltage can sometimes be challenging or disruptive (3.4.1)
- When implementing self-service planning tools there is a trade-off between accuracy and ease of use and assumptions need to be made when modelling average weeks based on historic data (3.5.5)

Additionally, lessons have been learnt as part of the trials. The following lessons will be documented further in Deliverable D4:

- The simulations of smart charging based on ICEV data showed that peak load minimisation and cost minimisation could be achieved at Royal Mail depots. The accuracy of these simulations will be modelled as further data becomes available from EV charging in each of the modes.
- Modelling has indicated that smart charging schedules could yield cost savings for Royal Mail and other depot-based fleet operators by managing charging load to avoid peak energy cost times. The same technique should also alleviate pressure on the distribution network at times when it is most constrained.
- In addition to reducing costs from peak energy usage, estimates of connection costs for the full electrification of several Royal Mail sites have been carried out. It was found that in all of the sites studied connection costs could be avoided or significantly reduced if peak load was reduced through peak load minimisation based optimisation.
- Trials of the profiled connection systems are at an early stage but have shown that it is possible to control overall load in line with a profile at some sites through the use of EVs. There is likely to be a need for a minimum volume of EV load, in proportion to background site load, for the controllable EV load to be able to compensate for variations in the background load.
- Initial trials have shown an ability to deliver flexibility on demand from EV charging at Royal Mail depots based on dispatches from the DNO. The tests did however highlight some issues that may affect the reliability of depot demand response, such as the limited predictability of vehicles at some locations, and reliance on authentication of vehicles to provide demand response in the trial method.

### 2.2.2.3 Outlook for the next reporting period

During the next reporting period, the WS2 will focus on:

- Continuing to capture and analyse data from charge points and telematics
- Carrying out further flexibility and profiled connection trials with a variety of timings, volumes and other parameters
- Continuing the execution of trial experiments in order to meet the project learning objectives
- Contributing interim learnings to Deliverables D4 and D5.



### 2.2.3 WS3 – Mixed trial

The mixed trial, shown in Figure 4, collects anonymised trip data from PH EVs in the London area and analyses this data to forecast future charging demands and network impacts. This trial commenced in August 2020 and is continuing to progress well.

#### 2.2.3.1 Progress in this reporting period

In the mixed trial, Uber has progressed the following activities:

- **Data** – Provided anonymised EV trip data to Hitachi on a monthly basis
- **Technology** – Continued to add additional EV drivers to their platform. Anonymised trip data is being captured from over 1,500 Uber EVs
- **Experiments** – Provided feedback on the results of data analysis based upon knowledge of Uber vehicle operations
- **Behavioural analysis** – Discussed the findings of the initial driver surveys and launched a second round of questionnaires.

Outside of the scope of Optimise Prime, Uber continued to operate its Clean Air Plan helping drivers upgrade to EVs and as part of this activity has developed cooperation with vehicle suppliers and CP operators. Uber's 'Uber Green' product enables customers in London to specifically request a zero-emissions vehicle.

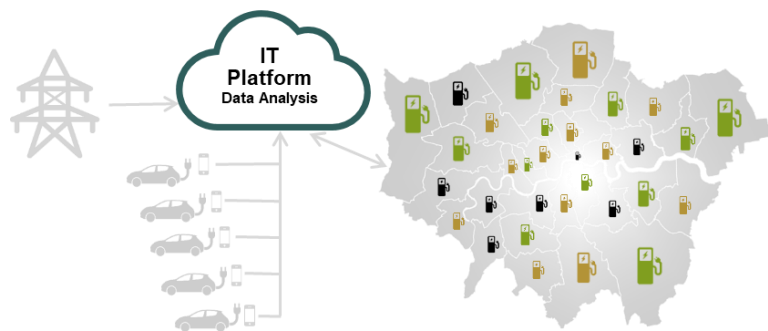


Figure 4 – Schematic of WS3 trial

UK Power Networks has progressed the following activities:

- **Network data provision** – Together with SSEN, provided regular updates to the maximum load data from secondary substations across their network in Greater London for use in the analysis, filtered to remove dedicated substations that could not be used to support EV charging
- **Experiments** – Reviewed and provided comment on the outcomes of the analysis and trial executions
- **Network modelling** – Worked with Hitachi and supplier Element Energy to evaluate how project data can be integrated into UK Power Networks' Strategic Forecasting System in order to improve forecasting of EV load growth and model the impact of the project methods on network upgrade costs.

Hitachi has progressed the following activities:

- **Data** – Continued to capture, validate and store the data from Uber, UK Power Networks, SSEN and CP location database Zap-Map
- **Analysis** –
  - Developed methodologies to derive estimated charging patterns from Uber's journey data, focusing on how the project will scale up the data to simulate future demand

- Revisited the design of some models to ensure that they perform effectively with the growing number of Uber EVs in the trials
- Carried out analysis of charging behaviour and patterns, and potential impact on the distribution network and reviewed this with Uber and UK Power Networks
- Continued to execute trial experiments and contribute towards the interim learnings in Deliverable D4

### 2.2.3.2 *Challenges & lessons learnt*

WS3's data capture has largely proceeded to plan, with data being captured successfully throughout the trial period and data analysis ongoing. As the number of vehicles in the trial has increased, some of the models have taken increasingly long to run and there has been a need to revisit and improve upon the design to make adaptations for the larger data sets.

Interim learnings from analysis of the data will shortly be published in Deliverable D4, some early conclusions from this work include:

- The time, location and magnitude of PH EV charge events can be estimated from Uber trip data
- There are a number of locations where drivers have to travel a significant distance in order to charge. Central London areas in the City of London and Westminster ranked highly in counts of both the frequency that drivers had to travel to other areas and the distance travelled, due to the low number of rapid CPs and the high volume of journeys undertaken
- Based on modelling the optimal CP for each charge event, the most popular CPs in London are utilised way beyond their capacity, suggesting drivers will have to queue in order to charge when they are at their busiest, or travel further in order to use non-optimal CPs
- Throughout the period of the trials, consistent growth has been seen in both the range of the vehicles in the mixed trials and the availability of charging infrastructure. Both of these are likely to have a material impact on the trials and charging requirements
- The vehicle type an Uber EV driver uses can influence the type of trips they conduct. EVs with low range were less likely to complete trips to airports.

### 2.2.3.3 *Outlook for the next reporting period*

During the next reporting period, the WS3 will focus on:

- Continuing the capture journey data
- Re-running and refining analysis as more data becomes available
- Visualising results for use in deliverables and knowledge exchange
- Focusing analysis on the modelling and impact of future growth in PH EVs and the resultant impact on the distribution networks.

## 2.2.4 **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. Hitachi's WS4 work supports WS1 and WS2 through the development of the Trials Operational Applications (i.e. the depot optimisation system and flexibility services) and the Site Planning Tool. WS4 also supports WS3 through the development of the data analysis capability.

As part of this workstream, UK Power Networks is developing the capability, within their systems, to receive and process profiled connection applications and manage the provision of flexibility services. Additionally, UK Power Networks will be utilising their Strategic Forecasting System to translate data and learnings from the project to impacts on the distribution network.

#### 2.2.4.1 *Progress during this reporting period*

This workstream has continued to make good progress during this period, managing the day-to-day operation of the IT platform and concluding the development of the core analytical tools and trials applications. The main Hitachi activities have included:

- **Data** – Supporting the ongoing process of capturing data from multiple sources for use in analysis
- **Depot control and optimisation** – The core development work on the depot systems concluded during this period, the team transitioned to supporting ongoing operations and developing improvements
- **Depot flexibility** – The flexibility service provider part of the depot applications were completed in this period and testing of the interface with UK Power Networks' ANM system was carried out
- **Data science** – Supporting the WS1, 2 and 3 trials through data analysis, including exploratory work to understand the data being captured across the trials
- **Security** – Continued to run regular security working group meetings to maintain the security of the system
- **Platform renewal** – Work began on migrating some services to a new IT platform as a result of support ending for an underlying component of the system which has reached end-of-life. This has occurred as a result of the extension of the project beyond its original expected duration.

UK Power Networks has:

- Completed its ANM system modifications to enable profiled connections monitoring
- Completed the integration of VisNet monitoring devices with its ANM system
- Completed its ANM system modifications to enable flexibility services within the trials and carried out integration and end-to-end testing with the Hitachi and Centrica flexibility systems.
- Worked with Element Energy and Hitachi to identify how project information can be integrated with the Strategic Forecasting System to model the wider network impact of fleet electrification and plan for the completion of this work.

Centrica have developed and tested the integration between their charging and flexibility platforms, as well as the integration with the ANM system.

#### 2.2.4.2 *Outlook for the next reporting period*

Over the next reporting period WS4 will focus on:

- Supporting the analytics required for WS1, 2 and 3
- Continuing to maintain and develop platform capabilities in line with trial requirements
- Utilising project data within the Strategic Forecasting System to quantify the network impacts of commercial vehicle electrification

### 2.2.5 **WS5 – Economic Analysis & Business Models**

This workstream is responsible for further developing the business case that was put forward in the Full Submission Pro-Forma (FSP), in addition to business models that will help speed up the transition to EVs for commercial fleets and evaluating the behavioural impacts on commercial EV use. This business modelling work will consider cost savings, behavioural analysis 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 EVs.

During this reporting period, this workstream has:

- Further refined and populated the TCO with data from the trials and other sources

- Continued behavioural analysis work, including the analysis of results from the first round of driver and fleet manager questionnaires. A second round of questionnaires, is currently being carried out;
- Drafted an operating model for the electrification of fleets to support the development of the TCO model
- Continued behavioural analysis work, including the analysis of the results from surveys capturing the views and attitudes of drivers and fleet managers on the EV transition of their fleets. A second round of surveys is now underway
- Began drafting of inputs for Deliverable D5.

UK Power Networks has contributed to the development of elements of the TCO modelling and the consideration of how Optimise Prime's Profiled Connection and Flexibility products will be integrated into existing connections and flexibility processes.

## 2.2.6 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 compiled and published [Deliverable D3](#), *Learnings from installation, commissioning and testing* as well as this PPR. All future Optimise Prime deliverables remain on track and their status can be found in Section 6.

During the next reporting period, WS6 will publish Deliverable D4, *Early Learnings Report on the Trials*, and Deliverable D5, *Interim report on Business Models*.

## 2.2.7 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.

### 2.2.7.1 Progress during this reporting period

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

- **Status & governance** – Running the project's governance and producing regular project status reports
- **Planning** – Maintaining the detailed project plan and budget
- **Resourcing** – Supporting the resourcing of all project teams
- **Risk management** – Maintaining the project Risks, Assumptions, Issues and Dependencies (RAID) log, including liaising with stakeholders regarding COVID-19 related risks
- **Status meetings** – Chairing regular project update meetings with workstream leads and project partners
- **Design Authority** – Providing the design authority function for WS1-4
- **Security Working Group** – Convening the Security Working Group and implementing the information risk management system
- **Deliverables review** – Reviewing the deliverables of the other project workstreams
- **Communications** – Maintaining the project website, [www.optimise-prime.com](http://www.optimise-prime.com)
- **Shared Learning** – The planning of conference speaking engagements and dissemination events. Further details of these can be found in Section 8.

### 2.2.7.2 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. Over this time the project will continue trial activity and analysis of data, publishing two deliverables providing stakeholders with an overview of interim findings.

As the project's experiments generate learnings of interest to the industry the workstream will increasingly focus on developing and managing the project's programme of dissemination activities.

## 2.3 Business case update

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](#), however Optimise Prime is continuing to monitor changes within the evolving EV industry.

It is expected that there will be impacts on EV take-up as a result of vehicle availability, the effect of COVID-19 and policy changes, including the UK Government's announced end of petrol and diesel car sales in 2030. However, the longer-term outlook for EV transition has not changed in a way that would adversely affect the project outcomes.

On 30 June 2021, Ofgem published a consultation on its 'minded to' decision on the Access and Forward-looking Charging significant Code Review. The review generally encourages the use of profiled connections and flexibility services, as developed in Optimise Prime. However, if the decision is implemented there will likely be changes to connection charging resulting in a greater proportion of costs being met by DNOs with lower costs for the connecting customer when connection upgrades are needed. This may result in changes to the business case with regards to the profiled connections, as the benefits to DNOs may increase but the incentives for connecting customers may reduce. Optimise Prime will continue to monitor developments in this area and will reflect any outcomes in the final reports.

The Optimise Prime business case will be 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

Progress in this period has been good. The necessary systems and processes were completed in time for the WS1 and 2 to start on time on 1 July 2021 and the project's third deliverable was published on time in August 2021. Since this time, the project has been collecting data from EVs and CPs while carrying out analysis and experiments. Some outstanding work was required to complete the flexibility services required for some of the trial experiments – these were delayed, but trials are now in progress.

WS3, mixed trials, has continued to make steady progress having been running since mid-2020. The project has continued to collect data relating to the journeys of over 1,500 EVs on the road throughout Greater London and focus is not turning towards predicting future demand growth and its impact on distribution network capacity.

Business modelling and behavioural analysis work, encompassing all three trials, has made strong progress, with behavioural surveys with EV drivers analysed, the TCO model revised and planning taking place for the publication of deliverable D5.

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**

| <b>Task name</b>  | <b>Sub-activities</b>   | <b>Status at end of period</b>   |
|---|---|--|
| <b>WS1 Home trial</b>   |   |  |
| EV and infrastructure rollout   | EV deliveries and CP installs                                   | Minimum target exceeded. Will continue until January 2022.   |
| Formal trials   | Carry out analysis and experiments                              | Began on 1 July 2021, ongoing  |
| Early learning report   | Draft report  | Drafted and in review for publication in deliverable D4  |
| System integration & testing  |   | Flexibility function completed October 2021  |
| Run flexibility trials  |   | Trial activity started, ongoing  |
| <b>WS2 Depot trial</b>  |   |  |
| Formal trials   | Carry out analysis and experiments                              | Began on 1 July 2021, ongoing  |
| Early learning report   | Draft report  | Drafted and in review for publication in deliverable D4  |
| End-to-End testing and commissioning                                    | Testing of control of EV charging infrastructure at depot sites | All testing completed and Swarco sites moved to OTA control  |
| Depot planning & optimisation systems                                   | Build and Test  | Development completed  |
| Run flexibility trials  |   | Trial activity started, ongoing  |
| Depot planning tool   | Build web-based site planning tool                              | Site planning tool tested, launched and minor changes made based on feedback   |
| <b>WS3 Mixed trial</b>  |   |  |
| Formal trials   | Carry out analysis and experiments                              | The trial period for WS3 began in August 2020 and is proceeding to plan  |
| 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   |
| Early learning report   |   | Drafted and in review for publication in deliverable D4  |
| <b>WS4 IoT Platform, Network Forecasting &amp; Flexibility Analysis</b> |   |  |
| Analytics platform  | Run, test and support   | Ongoing  |
| Flexibility functionalities   | Build and Test  | Complete   |
| ANM modification  | Design, Build, Test   | Complete   |
| GSA/SFS Modification  | Scope, Implement, Run   | Ongoing. Delayed from original plan to incorporate project data and learnings in design, but still on track to deliver required outcomes |
| <b>WS5 Business Model</b>   |   |  |
| TCO Model   | Draft model   | Model being reviewed and improved  |

| Task name  | Sub-activities  | Status at end of period                                   |
|--|---|---|
| Behavioural analysis                                 | Questionnaires and analysis                                   | First questionnaire round analysed. Round two in progress |
| Interim report                                       | Draft report  | Being drafted and will be published in deliverable D5     |
| <b>WS6 Reporting &amp; Deliverables</b>              |   |   |
| Deliverable D3                                       | Compile deliverable   | Complete, <a href="#">published</a> on 23 August 2021     |
| PPR December 2021                                    | Compile report  | Completed and published (this report)                     |
| Deliverable D4                                       | Compile deliverable   | In review, on schedule                                    |
| Deliverable D5                                       | Compile deliverable   | Being drafted, on schedule                                |
| <b>WS7 Project Management &amp; Sharing Learning</b> |   |   |
| Dissemination events                                 | Present at events to update on project progress and learnings | Events held, see Section 8                                |
| Website design and build                             | Maintain website  | Ongoing   |
| Project management                                   | Maintain project plan and budget                              | Ongoing   |
|  | 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 5. Since the previous PPR, the following non-material changes have been made:

- The start of the Centrica flexibility trials was delayed slightly and commenced in Q4 2021
- The rollout of the Centrica fleet has been extended to early 2022, though the minimum volume for the trials has already been met
- The ANM/GSA modification and integration task has been extended, reflecting the delay to the ANM system and the fact that development of integration with the Strategic Forecasting System will continue throughout the next year as the trial data to feed this network modelling activity becomes available.

These changes are not expected to impact upon the project completion date or meeting the project objectives.



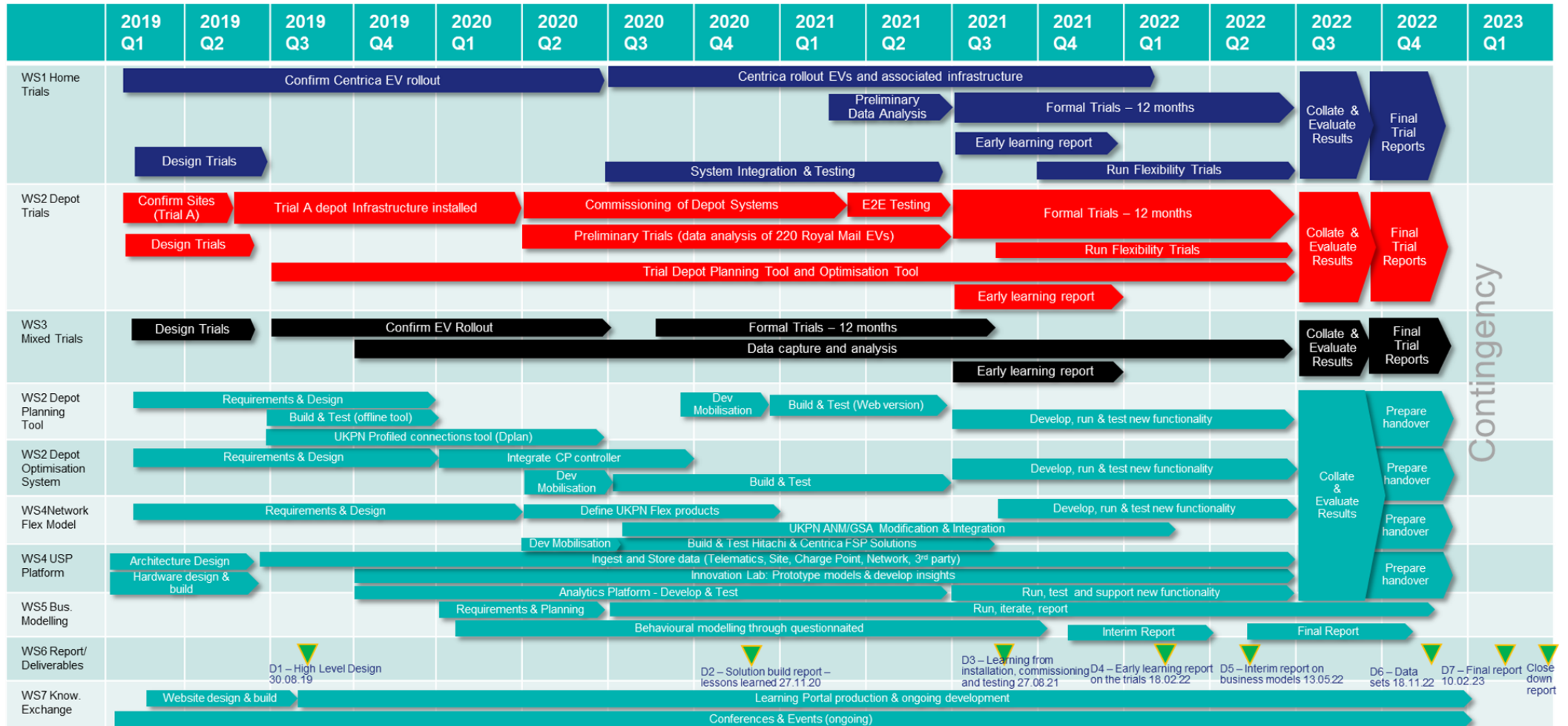


Figure 5 – Summary Project Plan

### 3.3 Identification and management of issues

As the project has moved from the preparation phase to the trial phase the nature of the risks and issues faced by the project has changed. The previous issue around ensuring there are sufficient vehicles to complete the trials have been resolved.

A particular issue that has arisen during this period is that Centrica have not been able to be fully engaged in the formal trials, as a result of the extended project and other internal resource pressures. Some elements of the flexibility and smart charging solutions were delayed as a result and ongoing technical issues with the control of charge points have also delayed Centrica's participation in some of the planned flexibility trials.

The project may have to further revise the trials plan to take account of this but there is a risk that reduced numbers of experiments, simpler experiments, or experiments held over a shorter period of time may weaken the applicability of trial results.

Centrica is working with its charge point supplier to resolve current control issues. The partners have produced a revised plan of flexibility trial activities taking into account the delays experienced so far, though may have to take further mitigations should delays continue.

Optimise Prime continues to monitor risks and emerging operational issues through regular reviews. Where necessary mitigations are put in place and lessons learnt are shared through the project deliverables. 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
  - Continuation of the trial activities, including the running of a number of flexibility events in products B and C
  - Contribution of initial findings to Deliverables D4 and D5.
- WS2 – Depot Trials
  - Continuation of the trial activities, including the running of profiled connections, a number of flexibility events in products A and B and periods of unmanaged and smart charging
  - Further refinement and testing of the Site Planning Tool with fleets
  - Contribution of initial findings to Deliverables D4 and D5.
- WS3 – Mixed Trials
  - Continue to capture and analyse journey data
  - Continue executing mixed trial experiments
  - Contribution of initial findings to Deliverables D4 and D5.
- WS4 – IoT Platform, Network Forecasting & Flexibility Analysis
  - Continued maintenance of platform and applications in support of the trials
  - Use of trial data in UK Power Networks' Strategic Forecasting System
  - Running of flexibility events and analysis of results
- WS5 – Economic Analysis & Business Models
  - Continued behavioural analysis through surveys
  - Business modelling activity based on findings from the trials, for fleet electrification and the project methods
  - Generate interim findings for Deliverable D5
- WS6 – Reporting & Deliverables
  - Complete Deliverables D4 and D5

- WS7 – Project Management & Sharing Learning
  - Continue to monitor project progress and budgets
  - Continue to update the project website
  - Monitoring of trial progress and planning of enhancements
  - Continue to participate in industry events and share project learnings.

## 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 Deliverables D1, D2 and D3 have been [published](#). On 20 February 2020, the project notified Ofgem of a non-material change, delaying the publication of deliverables D2-D7 by up to 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   | <a href="#">Published</a><br>29 August 2019   |
| 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 | <a href="#">Published</a><br>27 November 2020 |
| 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   | <a href="#">Published</a><br>23 August 2021   |
| D4 Early learning report on the trials                     | Report setting out how each trial is performing, data gathered, insights gained, changes required   | 18 February 2022 | In preparation, on schedule                   |
| 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      | In preparation, on schedule                   |
| D6 Data sets   | Final datasets gathered from the trials for dissemination to stakeholders.  | 18 November 2022 | Not yet due to start                          |

| Deliverable  | Description   | Due Date         | Status   |
|--|---|------------------|--|
| D7 Final learning report   | <p>A report covering:</p> <ul style="list-style-type: none"> <li>• A summary of the work undertaken</li> <li>• The insights gained from the trials</li> <li>• Recommendations and likely costs and benefits</li> <li>• Models for use of commercial EV flexibility by DNOs.</li> <li>• Recommendations on business models</li> <li>• How the trials, the infrastructure and technology should be transitioned after the project has completed and</li> </ul> <p>How to ensure integration of the Methods with DNO/DSO systems and processes</p> | 10 February 2023 | Not yet due to start   |
| Comply with knowledge transfer requirements of the Governance Document | <ol style="list-style-type: none"> <li>1. Annual Project Progress Reports which comply with the requirements of the Governance Document</li> <li>2. Completed Close Down Report which complies with the requirements of the Governance Document</li> </ol> <p>Evidence of attendance and participation in the Annual Conference, as described in the Governance Document</p>  | N/A              | <p>2019 and 2020 reports published. This report, together with the <a href="#">June report</a> meets the 2021 requirement</p> <p>Item 2 is not yet due to start.</p> <p>The project has participated in this year's annual ENIC conference</p> |

## 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, <http://innovation.ukpowernetworks.co.uk/wp-content/uploads/2021/11/UK-Power-Networks-Innovation-Data-Sharing-Policy-.pdf>.

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

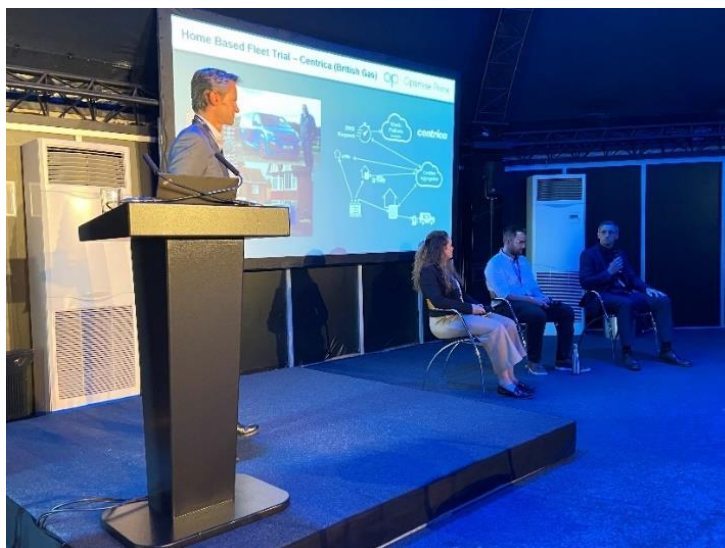
## 8 Learning outcomes & dissemination

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 PPRs and in the project's first deliverables.

Optimise Prime continues to maintain the project website [www.optimise-prime.com](http://www.optimise-prime.com), together with the project LinkedIn account <https://www.linkedin.com/company/optimiseprime>, providing periodical updates to interested stakeholders. The project's twitter account [https://twitter.com/optimise\\_prime](https://twitter.com/optimise_prime) is also sharing updates on the progress of the trials.

While the COVID-19 pandemic has limited the project members' ability to attend events in person, a number of presentations have been made to conferences organised in-person and online throughout this reporting period. Activities include:

- A workshop, jointly held with SPEN's Charge project at Cenex Low Carbon Vehicles conference on 22 September 2021, discussing how DNOs can support mass EV uptake (Figure 6)
- A [Q&A session on project progress](#) at the online Energy Networks Innovation Conference, 13 October 2021
- A knowledge sharing session between Hitachi and the Centre for Net Zero on 15 October 2021 discussing how government policy can accelerate decarbonisation for fleet operators, based on project learnings
- UK Power Networks Joined Hitachi for a [presentation and panel discussion](#) at COP26 on 9 November 2021, introducing how Optimise Prime is future-proofing London's grid for a EV future
- The publication and promotion of [Deliverable D3](#) through the project's website and social media accounts.
- Hitachi has presented the project through a series of videos, including:
  - [Journey to COP26](#) – featuring Hitachi's Richard Waters and Uber's Christopher Hook discussing the work being done in Optimise Prime and Uber's electrification plans.
  - [Delivering a Cleaner Future with Royal Mail](#) – Hitachi's James Bracegirdle and Royal Mail's James Baker discuss how Optimise Prime is helping Royal Mail plan its fleet transformation.
  - [A short film](#) produced by COP26 highlighting the work Hitachi is conducting with Royal Mail as part of Optimise Prime.



**Figure 6 - Presentation and workshop at Cenex LCV2021 event: panel including Hitachi, UK Power Networks and Royal Mail**

Where possible, presentations from events have been made available on the project website at <https://www.optimise-prime.com/presentations>.

## 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 (July – December 2021)**

| IP Description                         | Owner(s)             | Type                    | Royalties |
|--|----------------------|-------------------------|-----------|
| Optimise Prime Depot Management System | Hitachi              | Relevant foreground IPR | Nil       |
| <a href="#">Deliverable D3</a>         | All project partners | Relevant foreground IPR | Nil       |

**Table 4 – IP forecast next period (January – June 2022)**

| IP Description | Owner(s)             | Type                    |
|----------------|----------------------|-------------------------|
| Deliverable D4 | All project partners | Relevant foreground IPR |
| Deliverable D5 | All project partners | 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 June's PPR the project has identified risks R064 to R068. The project continues to monitor risks and issues through regular risk management meetings. Following each meeting risk impacts and mitigation plans are updated. Fifteen risks have been closed over this period, due to the risk passing, having been successfully mitigated or having evolved into an issue. Risks closed in previous reporting periods are omitted.

Table 5 – Project Risk Log

| ID                           | Name  | Risk Description   | Mitigation/Comments  | 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 | <p>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.</p> <p>20/02/20 – 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</p> <p>05/06/20 – Risk of further cost overrun reduced by decision to alter EV targets</p> <p>10/02/21 – Delay in completion of ANM flexibility features may require TOA team to be engaged for longer</p> <p>13/05/21 Exploring options but flexibility trials may involve manual process for products B&amp;C, currently impacting cost.</p> <p>13/10/21 Agreed to manage overspend due to ANM delay by utilising underspend from equipment budget – no impact on overall project budget.</p> | High           | High        | Negligible         | Open   | PM    | 30/11/21    |         |
| R002                         | Some aspects of the technical solutions are not achievable to the desired specification within the project budget | The project will not be able to investigate all of the available techniques                            | <p>- 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.</p> <p>- 21/04/21 The majority of this risk has now passed without issue or is successfully mitigated. There is still the remaining inherent risk that an issue could occur e.g. SetPoint processing interval constraints, reducing probability</p> <p>- 09/07/21 This risk is now negligible and will be closed once all work on flexibility is confirmed as complete.</p>  | High           | Negligible  | Low                | Open   | TDA   | 30/11/21    |         |



| ID   | Name  | Risk Description                             | Mitigation/Comments   | Impact on Cost | Probability | Impact on Schedule | Status | Owner | Last Review | Closure  |
|------|---|--|---|----------------|-------------|--------------------|--------|-------|-------------|----------|
| R003 | Solution design and implementation is more complex than initially thought | Potential over-spend on solution development | <ul style="list-style-type: none"> <li>- 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.</li> <li>- 25/11/19 – New partners may not use CPC, requiring integration with third party systems</li> <li>- 21/10/20 Delays to LPN ANM solution implementation may impact methods. Mitigation by using ANM in SPN area and alternative solution elsewhere</li> <li>- 16/11/20 Cloud hosted ANM system will be used by UK Power Networks for Optimise Prime</li> <li>14/04/21 – Risk remains open until all Flexibility efforts are complete</li> <li>13/05/21 – Considering different options including setting up a manual based flexibility trial design for Products B &amp; C, allowing lessons to be learned for full implementation.</li> <li>13/10/21 – ANM and FSP system development has taken longer than planned but is now complete ready for test; VisNet install for profiled connections not possible at Mount Pleasant due to space constraints; some other sites delayed</li> <li>12/11/21 – Closed as ANM changes complete and final work on other items covered by other risks.</li> </ul> | High           | Low         | High               | Closed | PM    | 12/11/21    | 12/11/21 |
| R004 | Solution does not deliver anticipated outcomes                            | Lower than expected value delivered          | <p>Trials design agreed on 07/06/19.</p> <p>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.</p> <p>Solution design and business case regularly reviewed throughout the project lifecycle and changes are made where needed</p> <p>Review of each Deliverable by UK Power Networks prior to submission to Ofgem to ensure the solution delivers the outcomes</p> <p>25/11/19 – Independent assessor has not raised issues with trials/solution design</p> <p>22/05/20 – Imperial College review supports statistical significance of the trial methods to meet learning objectives</p> <p>13/04/21 – Outcomes are under consistent report as experiments and deliverables are published, the control is to continually ask within these periods whether the project is still on target to meet the expected outcomes</p> <p>13/05/21 – Looking at benefits management to better measure progress to outcomes</p> <p>13/10/21 – No further updates to note</p>  | Negligible     | Low         | Negligible         | Open   | PM    | 30/11/21    |          |

| ID   | Name  | Risk Description   | Mitigation/Comments  | Impact on Cost | Probability | Impact on Schedule | Status               | Owner | Last Review | Closure  |
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| R005 | Partner performance is not contractually defined                              | Outputs delayed or inadequate and potential overspends   | Weekly meetings with Project Partners, Suitable incentives where required<br>Shared responsibilities for deliverables<br>Contracts signed on 18/03/19<br>Partners remain committed and performance is tracked by weekly meetings and programme governance<br>- 12/08/20 The delay has resulted in some resource constraints at Centrica for delivering flex trials. Mitigated by rescheduling of trial activity to reduce and batching some trial preparation activity.  | Medium         | Medium      | Medium             | Open                 | PM    | 30/11/21    |          |
| R006 | Suitable equipment suppliers cannot be found                                  | Project will be delayed or require re-scoping  | Realistic requirements specified at FSP.<br>Early consultation with suppliers.<br>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<br>22/04/20 – Made negligible as do not see need for more suppliers/equipment at this time<br>13/04/21 Risk to remain open until all equipment in place<br>09/07/21 – All suppliers are known, risk closed   | Low            | Negligible  | High               | Closed – Risk Passed | PM    | 09/07/21    | 09/07/21 |
| 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.<br>Realistic requirements specified at FSP.<br>12/03/20 – Hitachi pilot site installed and ready for testing<br>10/02/21 – Trowbridge testing ongoing, site chosen for RMG on site tests<br>16/03/21 – Initial end-to-end testing has been carried out at Orpington and Bexleyheath depots<br>13/04/21 – Operations lead now has a detailed plan to test all equipment prior to trial commencement which has broad support, leaving risk open until tests are executed against that plan<br>13/05/21 – Additional 2 OTA sites are being enabled by end of May, subject to that happening those sites will also be tested prior to trial commencement.<br>09/07/21 – All equipment tested and confirmed working.<br>Closed. | High           | Low         | Medium             | Closed – Risk Passed | PM    | 09/07/21    | 09/07/21 |
| 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<br>Weekly status reports with the Partners, and quarterly governance meetings to assess performance.<br>Do not expect any existing partner to withdraw.   | Medium         | Low         | High               | Open                 | PM    | 30/11/21    |          |
| 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    | 30/11/21    |          |

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|------|---|---|---|----------------|-------------|--------------------|--------|---------------------|-------------|----------|
| R013 | Specification and build of trials and technology solution takes longer than planned | Project delays                                | <p>Trials design agreed on 07/06/2019.</p> <p>27/06/19 – Technical Delivery plan created, close collaboration with Development team in Lisbon set up.</p> <p>14/10/19 – Planning work completed in September 2019, regularly revise based on progress</p> <p>12/03/20 – Tech team rolled off. Resumption dependent on fleet progress</p> <p>22/05/20 – Deliverables delayed to accommodate delayed technology build caused by EV availability</p> <p>01/09/20 – Applications development re-started and replanned to meet new trial start deadline.</p> <p>10/02/21 – Final build of flexibility solution may be impacted by delayed ANM Flexibility build</p> <p>16/03/21 – D3 deadline and trial scheduling should mitigate ANM delays, however there is uncertainty over whether Centrica will be able to deliver flex integration in time for D3</p> <p>21/04/21 – Both Centrica and SGS have produced tentative plans that deliver into August/September or will have impact to the trials period</p> <p>13/05/21 SGS delivery of full implementation of flexibility products B&amp;C is due early October. The project team are exploring options to start the trial as planned including utilising a manual based approach.</p> <p>15/09/21 – SGS and Centrica flexibility solutions still on track for October delivery. Some minor changes being made to Site Planning Tool UI based on feedback.</p> <p>12/11/21 – Closed as SGS development now complete. Centrica-ANM integration complete with CP control issues covered in Risk 68.</p> | Medium         | High        | Medium             | Closed | TDA                 | 12/11/21    | 12/11/21 |
| R016 | Major issues with equipment causing damage to network or causes injuries            | Equipment is damaged or individual is injured | <p>Analysis of this potential is carried out early in the project and recommendations are incorporated into the design.</p> <p>22/04/20 – Pilot site in place, insurance in place, no issues to date &amp; minimal risk – change to negligible</p> <p>13/10/21 – Risk has not changed in profile or controls from last review</p>   | High           | Negligible  | Low                | Open   | Trial Operations PM | 30/11/21    |          |

| ID   | Name   | Risk Description   | Mitigation/Comments   | Impact on Cost | Probability | Impact on Schedule | Status | Owner | Last Review | Closure |
|------|--|--|---|----------------|-------------|--------------------|--------|-------|-------------|---------|
| 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.<br>22/04/20 – all equipment except load/connection monitoring in place for WS2 Trial A. Commissioning and WS1 progress paused by COVID-19.<br>22/05/20 – Measures now in place to resume work safely.<br>13/04/2021 – Risk to remain open until Panoramic Power installs are complete and VisNet hubs are installed<br>13/05/21 – Panoramic Power now all installed, VisNet surveys are now ongoing.<br>09/07/21 – Visnet hubs delayed, some physical issues at sites and contractual issues delaying install – ongoing progress covered in R055 | Low            | Medium      | Medium             | Open   | PM    | 30/11/21    |         |
| 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 OZEV. Lobby where necessary.<br>13/10/2021 – Ofgem's minded to decision on the Access and Forward-Looking Charges Significant code review may impact the business case of profiled connections for connecting customers and DNOs. If implemented, this type of flexibility may be more valuable to DNOs but might provide less of an up-front cost reduction for customers.  | High           | Low         | Low                | Open   | PM    | 30/11/21    |         |
| 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. Ofgem is notified of changes and consulted where necessary  | High           | Low         | Negligible         | Open   | PM    | 30/11/21    |         |

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|------|------------------------------|---|--|----------------|-------------|--------------------|--------|-------|-------------|----------|
| 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<br>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<br>30/04/19 – Fortnightly meetings taking place<br>14/06/19 – Draft Strategy produced and a list of target potential participants being pursued.<br>29/11/19 – Targeted spend option chosen to give time for vehicle procurement<br>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 result<br>17/07/20 – Centrica have announced order for 1,000 vehicles and should now meet project requirements. Probability changed to Low.<br>16/11/20 – Centrica have confirmed plans for 2020 and committed to regular rollout progress reports<br>13/04/21 – On track for minimum before July and all vehicles by September<br>14/06/21 – 322 vehicles on the road, minimum target met for data capture<br>14/09/21 – Rollout continues, full 1,000 EV programme delayed, expected to complete in January 2022.<br>30/11/21 – Work ongoing to ensure minimum number of vehicles involved in flexibility trials. | High           | Low         | High               | Open   | PM    | 30/11/21    |          |
| R031 | WS2 – EV target not met      | Potential that WS2 is unable to meet EV targets due to factors outside Project control, e.g.:<br>Vehicle availability, TCO Issues, change in corporate strategy<br>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.<br>Project will work with Hitachi Capital and new participants to endeavour to meet the volumes. Stage Gate process in place.<br>New trial participant on-boarding work begun<br>29/11/19 – Targeted spend option chosen to give time for vehicle procurement<br>22/04/20 – all 220 Trial A vehicles on road<br>22/05/20 – Exploring number of vehicles required for statistically significant results<br>11/06/20 – Revised EV targets will reduce risk as current volume exceeds statistical minimum. Probability changed to Low.<br>16/09/20 – Royal Mail may add small number of EVs at existing sites during next year<br>13/04/2021 – Royal Mail are still on track for 70 additional vehicles by end of May with 12 additional vehicles in use in the OTA sites. Risk diminishing.<br>13/10/21 – Current batch of vehicles delivered and in use.<br>12/11/21 – Target number of vehicles exceeded. Closed.   | High           | Negligible  | High               | Closed | PM    | 12/11/21    | 12/11/21 |

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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 27/08/2020. 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.      | <p>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.</p> <p>14/10/19 – Likely that D2-7 will be delayed while EV numbers are confirmed</p> <p>29/11/19 – Delay agreed at board meeting, re-planning to take place</p> <p>20/02/20 – Ofgem informed of change, will continue to monitor in case of further challenges</p> <p>21/10/20 – Potential for ANM system delay in LPN to risk not completing before D3 due</p> <p>16/11/20 – UK Power Networks exploring use of cloud hosted ANM system</p> <p>13/04/21 – Risk remains until Centrica and UK Power Networks integration is complete (currently on track well ahead of D3)</p> <p>13/05/21 – Will satisfy D3 requirements by integrating flexibility products A and B.</p> <p>12/08/21 – D3 has been drafted and reached final review. Closed.</p> | Low            | Low         | Medium             | Closed – Risk passed | PM    | 12/08/21    | 12/08/21 |
| R041 | Lack of coordination for integrating UK Power Networks systems with Hitachi IoT platform and home aggregation platform | There is currently no dependency built into 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. | <p>11/09/19 – Work with Partners to build the key dependencies into the overall programme plan and track progress</p> <p>2/3/09/19 – Identifying resource requirements for integration and testing of project systems and infrastructures.</p> <p>14/10/19 Dialogue ongoing between Hitachi, UK Power Networks and Centrica.</p> <p>12/02/20 – Draft plan completed for discussion – UK Power Networks planning ANM developments</p> <p>22/04/20 – Further flex meetings with Centrica. R32 merged to remove duplication.</p> <p>22/05/20 – ANM systems vendor carrying out work to capture detailed requirements for integration of the partner systems</p> <p>16/09/20 – First draft of flex design is written and being reviewed.</p> <p>16/03/21 – API spec received and design being updated</p> <p>13/05/21 – Risk remains until integration is complete</p> <p>09/07/21 – Risk closed, as ANM Strata/Hitachi testing is complete</p>   | Medium         | Medium      | Medium             | Closed – Risk passed | PM    | 09/07/21    | 09/07/21 |

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|------|--|--|--|----------------|-------------|--------------------|--------|--------------|-------------|---------|
| 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.<br>23/06/20 – Discussing potential to test control via back office with CPO providers as alternative method<br>16/11/20 – Awaiting costs and timeframes<br>11/02/21 – Working more closely with CPOs to resolve issues and implement over air functionality.<br>13/04/21 – Trials Operations lead will continue to work with all suppliers etc. to monitor risk level<br>14/09/21 – CPMS provider moved hosting to AWS. Testing appears to have been successful.   | Low            | Low         | Low                | Open   | Design Auth. | 30/11/21    |         |
| 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<br>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.<br>07/04/20 – Site works suspended. Centrica warn that lead time on vehicles likely to extended and other works delayed.<br>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<br>11/06/20 – Board decision to re-size trials mitigates some risks regarding finding partners, changed probability to low<br>13/10/20 – Risk remains but is low as all partners have or are committed to have vehicles.<br>16/11/20 – Second lockdown started – no major impact yet, continuing to monitor<br>08/12/20 – Lockdown passed with no material impact.<br>07/01/21 – Third lockdown entered. Has resulted in reduction in Uber trips and is likely to have an impact on development efficiency<br>16/03/21 – Uber trips now recovered. Royal Mail Depot questionnaires delayed (see R59)<br>13/04/21 – The continued global effects on supply chains and UK based restrictions still have impact on the programme although general signs are good, the risk will remain<br>09/07/21 – Sufficient vehicles in place, very few minor risks remain with most mitigated, downgraded to low. | Negligible     | Low         | Medium             | Open   | PM           | 30/11/21    |         |



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| R053 | Limited control of legacy CPs at depot sites | Testing at FAT site has identified that iHost/CPC is not effectively controlling Swarco CPs. If not fixed this will limit project's ability to control some vehicles at RMG sites.                                      | 30/06/20 – Nortech have raised the issue with Swarco. Swarco are revising the firmware of the units in order to allow full control of the CPs by iHost/CPC<br>21/10/20 – Site visit with Swarco has identified issue and upgrade is being rolled out to all CPs. Awaiting testing.<br>16/11/20 – Fix has been tested at Trowbridge and appears to have resolved issue. Monitoring.<br>11/02/21 – Proceeding with OTA to connect remaining Whitechapel CPs<br>13/04/21 – Risk will be closed once all OTA site CPs fully tested<br>09/07/21 – Following testing agreed that all Swarco devices will move to OTA solution to improve controllability<br>12/08/21 – All Swarco devices migrated. Risk closed. | Negligible     | Low         | Low                | Closed – Resolved | PM    | 12/08/21    | 12/08/21 |
| R054 | Reliance on third party systems – CSMS       | The project relies on a secure connection with Royal Mail's CSMS to control RMG chargers. The project has no direct contractual relationship/SLA with the CSMS. Due to a VPN configuration change comms were disrupted. | 17/08/2020 – Continuing to press CSMS to resolve the issue via Royal Mail and Nortech. Issue caused by their third party IT service provider.<br>16/09/2020 – Static IPs have been established to resolve this issue and prevent reoccurrence.<br>13/04/21 – Continuing to manage relationship with suppliers where required.<br>09/07/21 – Risk will remain throughout project and has not changed in profile.<br>12/11/21 – A platform change by a CSMS provider resulted in a short comms outage due to IP change. VPN is now in place to prevent reoccurrence.   | Low            | Medium      | Low                | Open              | PM    | 30/11/21    |          |

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| R055 | LV monitoring of Royal Mail sites on the network side of the POC. | Profiled connection requires the network side of the POC to be monitored to ensure adherence of the customer's site to the agreed profile. For customers who are not connected via dedicated feeders or substations, an alternative monitoring solution needs to be installed at the metering point on customer's site and will require integration to UK Power Networks' ANM system to transfer the real-time analogue measurements. This integration development work will require additional time & effort and there is risk that trial activities may be delayed as a result. | 06/11/20 – Have identified a UK Power Networks approved LV monitoring solution that could potentially be utilised for this application. Continue to engage internally within UK Power Networks as well as with the supplier to confirm suitability of using the LV monitoring solution. Once confirmed engage with LV monitoring equipment and ANM system suppliers to develop a plan to deliver the integration development work.<br>16/03/21 – Due to age of electrical installation at some sites, installation may take longer than originally planned<br>14/04/21 – Risk remains until hubs are installed<br>13/05/2021 – Site surveys are in progress to identify any enabling works to install the equipment. Continuing to monitor the risk.<br>09/07/21 – Install only gone ahead at one site. An interim monitoring approach is needed<br>12/08/21 – Three sites now monitored. One lacks space for install.<br>12/11/21 – Seven devices installed at six depots, installation at final site planned. One further depot de-scoped due to site specific issues. All sites being monitored at customer side, so delay has not impacted profiled connection trials. | Low            | Medium      | Medium             | Open              | UK Power Networks PM | 30/11/21    |          |
| R058 | Support for container platform                                    | Due to project extension the container platform is reaching end of life and requires replacement or extended support arrangements   | 01/03/21 – Hitachi team are reviewing options<br>12/04/21 – Options plan due, considering outage risk<br>13/05/21 – Plan being developed to mitigate risk<br>09/07/21 – Decided to re-platform to Azure platform with parallel run to ensure no impact to trials<br>12/08/21 – Closed as decision to re-platform made. Risk R67 opened to cover potential risks from migration process   | High           | High        | High               | Closed – Resolved | Platform PM          | 12/08/21    | 12/08/21 |
| R060 | Delivery of Optimise Prime ANM Schemes Delayed                    | Subcontractor requires additional time to complete design of Flexibility Services requirements leading to delays in delivery of the ANM schemes for pre-trial activities, start of trials and meeting requirements for Ofgem Deliverable D3.  | 16/04/21 – Working to ensure MVP requirements are delivered to meet start of trials and Ofgem D3 requirements. End of Sprint demos during development, enhanced configuration process and combining/streamlining FAT, Pre-prod and prod testing to identify and resolve issues earlier in development cycle.<br>30/04/21 – Will perform the first tranche of product B&C formal flexibility trials in a fully manual process. Integration will be expedited to meet deliverable C requirements.<br>14/06/21 – Timings now well understood and baseline plan impacted. Mitigations in place to allow trial period to start on time.<br>12/08/21 – Tested Products A and B successfully, with some work-arounds where functionality not ready. Sufficient to provide detail for Deliverable D3.<br>13/10/21 – ANM systems development work complete – risk closed.   | High           | High        | High               | Closed – Resolved | UK Power Networks PM | 12/08/21    | 12/08/21 |

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| R061 | UKPN IS documentation requirements delaying integration of VisNet Hub to ANM Strata | UKPN IS has flagged up the need to produce IS related documentation for Optimise Prime which will take time & effort. This will lead to delay in carrying out integration work between the VisNet Hub and In-Cloud ANM Strata possibly delaying trials. | 16/04/21 – Discussing with IS to explore options to address this requirement such as using the existing ANM IS documentation artefacts but adding an Appendix to capture Optimise Prime architecture<br>13/05/21 – Architecture documentation is in progress<br>09/07/21 – No longer a risk, all required information shared and accepted.                                      | Medium         | High        | Medium             | Closed – Resolved | UK Power Networks PM | 09/07/21    | 09/07/21 |
| R062 | Royal Mail – amendment agreement sign-off delay                                     | More detailed information on the scope LV monitoring works is needed in the amendment agreement. The installation of the LV monitoring equipment cannot take place until agreement is signed off from all parties.                                      | 16/04/21 – Carry out site surveys as soon as possible to capture the scope of works at each site. Prioritise installation of the VisNet Hub at Dartford.<br>13/05/21 – RMG to agree a contract which allows installations to be performed on a per-site basis.<br>15/09/21 – Contract drafted and ready to sign.<br>30/09/21 – Contract signed – closed                         | High           | High        | Medium             | Open              | UK Power Networks PM | 30/09/21    | 30/09/21 |
| R063 | Setpoint Spacing Constraint – Depot Control   | Through testing it has emerged that there is a constraint on the frequency of setpoints that can be sent to charge points. There needs to be a minimum spacing between the setpoints sent to each charge point and socket.                              | 12/05/21 – Minimum spacing between setpoint requests confirmed for each charge point type. A control strategy has been drafted to respect this limitation and it is not expected that this will impact ability to respond to flexibility events. The changes will require more development time. Remains open until tested.<br>09/07/21 – Spacing developed and tested. Closed. | Low            | High        | Low                | Closed – Resolved | Hitachi PM           | 09/07/21    | 09/07/21 |
| R064 | Delay to network impact modelling work  | Lack of clarity on timeline for network modelling, including the Strategic Forecasting System development, impacts planning of input to deliverables. And completion of seven experiments across the trials.  | 23/06/21 – Potential issue of delay raised with UK Power Networks, following requirements document sent on 22 April<br>08/07/21 – Plan still outstanding<br>14/09/21 – Meetings held with Element Energy to discuss integration of project data with tool<br>09/11/21 – Timeline and relationship to deliverables agreed, risk closed   | High           | High        | High               | Closed – Resolved | Hitachi PM           | 12/11/21    | 12/11/21 |
| R065 | Change of UK Power Networks Project Manager   | UK Power Networks PM has moved to another project. Interim resource is covering but splits time over several projects. Risk to completion of tasks under UK Power Networks control.   | 28/06/21 – PM has left project, as mitigation, PM is still within UK Power Networks so knowledge should not be lost.<br>12/07/21 – UK Power Networks team may not have sufficient resource to cover current tasks. Raised as concern.<br>12/08/21 – Additional support appointed and the risk has reduced.<br>15/09/21 – Closed.  | Low            | Medium      | High               | Closed – Resolved | UK Power Networks PM | 15/09/21    | 15/09/21 |

| ID   | Name  | Risk Description  | Mitigation/Comments   | Impact on Cost | Probability | Impact on Schedule | Status | Owner               | Last Review | Closure |
|------|---|---|---|----------------|-------------|--------------------|--------|---------------------|-------------|---------|
| R066 | Production of statistically significant data for flexibility trials           | The trial partners do not have full agreement on the number of flex events and combinations of parameters needed, creating a risk of not meeting commitments with Ofgem   | 20/09/21 – A plan for flexibility events throughout the year has been set out and is being exercised for RMG. This covers all required combinations. For Home trials, further revision is ongoing to match effort required to available resources at Centrica.<br>13/10/21 – Possibility of a resource constraint in Centrica and UK Power Networks impacting the number of possible executions, though still on track to deliver statistically significant data at this time<br>12/11/21 – Centrica are experiencing issues controlling CPs for flexibility purposes reliably. Working with CP manufacturer to resolve. Risks delaying flexibility trials with larger numbers of vehicles and may need extra flex periods planned<br>30/11/21 – Centrica are in the process of re-testing flexibility provision with UK Power Networks in order to increase trial sample | Medium         | Medium      | Medium             | Open   | Hitachi PM          | 30/11/21    |         |
| R067 | Migration of platform results in loss of data or interruption to applications | The project systems need to be migrated to a new platform (R058) to ensure ongoing support. The transition process presents the risk of an interruption to data gathering or loss of data   | Regular backup of all data and applications taking place. Thorough testing of all services will occur before cutover.   | Medium         | Low         | Medium             | Open   | Hitachi Platform PM | 30/11/21    |         |
| R068 | Centrica resource and technical constraints                                   | As a result of the extended project and other internal resource pressures, Centrica have not been able to be fully engaged in the formal trials and some elements of the flexibility and smart charging solutions have been delayed. Reduced numbers of experiments, simpler experiments, or experiments over a shorter period may weaken the applicability of trial results. Some technical issues in communicating with the ANM system and controlling CPs has also delayed some trial activities and risks further delaying experiments. | Hitachi and UK Power Networks are working closely with Centrica to understand the resource constraints and re-plan flexibility trialling activities accordingly. Where possible, some flexibility tenders are being combined to cover multiple days in one event.<br>Trialling of flexibility services with product B began, utilising the Centrica and ANM systems in October 2021, starting with a smaller subset of vehicles, but with plans to expand the sample. Some control issues were experienced by Centrica, who are working with the CP manufacturer for a resolution and are in the process of carrying out further tests with UK Power Networks.<br>The partners have produced a revised plan of flexibility trial activities.  | Medium         | High        | High               | Open   | Hitachi PM          | 30/11/21    |         |

## 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  
8 December 2021  
Suleman Alli  
Director of Customer Service, Strategy, Regulation & IS  
UK Power Networks