

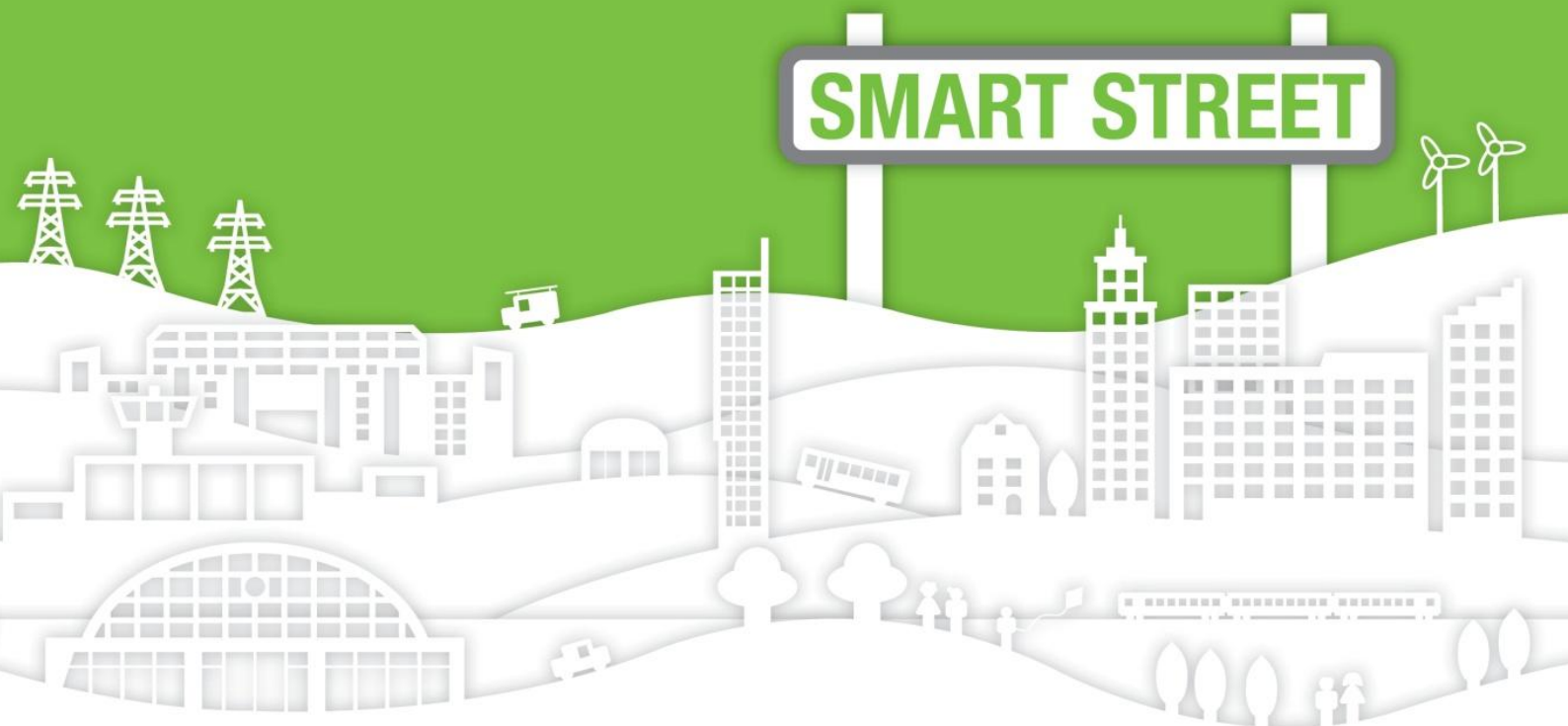


Smart Street

Project Progress Report (PPR)

Version 1.0

18 December 2015



VERSION HISTORY

Version	Date	Author	Status	Comments
1.0	18 Dec 2015	K Hoban	Version 1.0	

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GLOSSARY OF TERMS

Abbreviation	Term
C ₂ C	Capacity to Customers (Electricity North West second tier LCN Fund project)
CEP	Customer engagement plan
CLASS	Customer Load Active System Services (Electricity North West second tier LCN Fund project)
CVR	Conservation voltage reduction
DINIS	Distribution network information system
DNO	Distribution network operator
DPS	Data protection statement
ECP	Engaged customer panel
FAT	Factory acceptance test
HV	High voltage
ICCP	Inter control communication protocol
IFI	Innovation Funding Incentive
ITT	Invitation to tender
LCT	Low carbon technology
LV	Low voltage
NMS	Network management system
SAT	Site acceptance test
SDRC	Successful delivery reward criteria
SDRC output	Discrete evidence of attainment or part attainment of an SDRC as defined in the Project Direction
SP5	Spectrum Power 5
UoM	University of Manchester

All other definitions shown starting with a capital letter are as per Low Carbon Networks Fund Governance Document v.6.

1 EXECUTIVE SUMMARY

Funded via Ofgem's Low Carbon Networks Second Tier funding mechanism, Smart Street is being undertaken by Electricity North West and key partners. The Smart Street Project was authorised to commence in December 2013 and is due to complete in December 2017.

Utilising the most advanced technology developed for LV network management, Smart Street challenges current operational practices and demonstrates how to optimise HV and LV networks in real time.

The Smart Street Method combines the concepts of interconnection of networks, developed within the C₂C project, and elements of the voltage control technologies developed by Electricity North West under the first tier of the LCN Fund. The Project utilises advanced real time optimisation software to simultaneously manage all HV and LV network assets to respond to customers' changing demands in the most efficient end-to-end manner. The three key incremental steps in the Smart Street Method are the application of:

- Co-ordinated voltage control, using transformers fitted with on-load tap changers and capacitors, across HV and LV networks
- Interconnecting traditionally radial HV and LV circuits and assuming control of these networks within the Electricity North West control room
- Real time co-ordinated configuration and voltage optimisation of HV and LV networks.

Enhancing existing networks in this way enables accelerated connection of clusters of LCTs that contribute to emission reduction targets. Smart Street is a low risk, transferable, non-intrusive method which is an alternative first intervention to traditional network reinforcement. It is envisaged that the Smart Street Method will release capacity up to four times faster and 40% cheaper than traditional reinforcement techniques for LCT clusters. Smart Street's optimisation software is expected to deliver conservation voltage reduction to improve the energy efficiency of customers' electrical appliances, reducing energy up to 3.5% per annum, and lowering network losses by up to 2% per annum across HV and LV networks. This will deliver recurring financial savings for customers, without degradation to the quality of customers' supplies.

During Smart Street, communications from customers in the trial areas will be monitored to collect quantitative customer information. The Project team will also hold a series of customer focus groups recruited from within the trial areas to collect qualitative customer information. In addition, outputs from the CLASS survey will be utilised, which are designed to establish the customer experience of a change in supplied voltage to supplement the customer research.

Progress to date

The Project is behind the original schedule and a four-month extension including a variance to Project management costs was requested on 16 September 2015 in order to commission the three ground-mounted HV capacitors. The Project costs to date are £5,890k with completion costs estimated to be £8,792k of the £9,550 budget including contingencies.

This report is the fourth Project Progress Report and covers the period June 2015 to November 2015 inclusive. The key highlights to date are:

Installation plan

- The majority of the installation work is now complete (detail in section 2.2) with the HV capacitor installations programmed for completion in January 2016
- Post installation, a number of LYNX devices and associated housing failed. These devices have been removed pending a redesign and will be refitted on site before the revised trial start date.

Spectrum Power 5

- The Spectrum Power 5 has successfully passed FAT and has been installed onto Electricity North West's IT network.

- Pre SAT has been conducted to reduce risk of non-compliance in full SAT, which has been delayed until December due to delays encountered during the build phase.

Trials and research

- The trial and research workstream has continued (detail in section 2.3) with end-to-end testing carried out in one trial area to confirm the accuracy of the data being received by Spectrum Power 5.

Customer engagement

- The customer engagement workstream has continued (detail in section 2.4) with customer contact centre (CCC) briefings and communications with suppliers delivered
- Two customer enquiries have been raised and resolved in the reporting period.

Learning and dissemination

In addition to continued dissemination and knowledge sharing with stakeholders, and regular updates on the Project website and via social media, the Project has:

- Published the second Smart Street advertorial in the IET magazine in July 2015
- Published an electronic newsletter update in July 2015 to all key stakeholders
- Held the first knowledge sharing event on the 13 October 2015 at The Crystal, London in conjunction with our Project Partner Siemens
- Presented the Project at the 2015 annual LCNI conference in Liverpool during November.
- Presented to a number of internal audiences in preparation of commencement of trials.

During the reporting period the Project has delivered eight of 14 SDRC outputs detailed in section 5. Four SDRCs have been deferred until January 2016 and two until February 2016 pending a four-month Project extension request.

Table 1.1: SDRCs delivered during the reporting period

Milestone	Workstream	Completion date
Publish LV network management protocols by June 2015	Technical	June 15
Electricity North West operational personnel, including control engineers briefed and/ or trained on LV network management protocols by June 2015	Technical	June 15
Publicise Smart Street within Electricity North West in monthly team brief pack and Volt (intranet) and/ or Newswire (bimonthly employee magazine) by June 2015	Dissemination	June 15
Project Progress Reports published on Smart Street website June 2015	Project management	June 15
Customer contact centre training delivered and materials published on the intranet by July 2015	Customer	July 15
Publish advertorials by July 2015	Customer	July 15
Host Smart Street knowledge sharing event	Dissemination	October 15
Active participation at the annual LCNI conference 2015	Project management	November 15

During the next reporting period the Project will deliver eight SDRC outputs in line with the proposed four-month extension period.

Table 1.2: SDRCs delivered during the next reporting period

Milestone	Workstream	Completion date
Project Progress Reports published on Smart Street website December 2015	Project management	December 15
Confirmation received from University of Manchester and Queen's University Belfast confirming successful receipt of/completion of data transfer process by September 2015	Research/trials	January 16
Publish network equipment specifications and installation reports by September 2015	Technical	January 16
Publish NMS, interface and optimisation configuration and commissioning reports by September 2015	Technical	January 16
Publicise commencement of live trial on Smart Street website by September 2015	Dissemination	January 16
Publish trials and test regimes design report on Smart street website	Research/trials	February 16
Publish advertorials	Customer	February 16
Raw monitoring data available via Smart Street website by December 2015	Research/trials	April 16

Summary of key risks

Project risks are monitored on a continuous basis, including those potential risks that were documented in the Full Submission. The status of these is described in section four.

Summary of key learning outcomes delivered in the period

A detailed description of the Project's learning outcomes can be found in section six, the areas where learning has emerged are summarised below:

- The accuracy of the LV network records was inconsistent. Inaccuracies had to be identified and corrected
- The embedded enquiries/complaints process continues to identify and resolve smart Street related customer issues
- Modification of certain new street furniture to resolve a real and perceived customer concern regarding anti-social behaviour.

The Project expenditure has been realigned due to the phased rollout of the construction phase.

Table 1.2: Third party dissemination activities

Event	Contribution	Date
Project Progress Report published on Smart Street website June 2015	Media	June 15
Hosted Smart Street knowledge sharing event at the Crystal, London	Presented	October 15
Active participation and presentation of Smart Street at 2015 Infuse conference, Belfast	Presented	October 15
Active participation at the annual LCNI conference 2015	Presented	November 15

2 PROJECT MANAGER'S REPORT

2.1 General Project management

The most significant Project management activities undertaken during the reporting period are listed below:

- Project monitoring and control
- Continued stakeholder engagement and management
- Dissemination of the Smart Street Project at industry events and the first Project knowledge sharing event.
- Project extension request due to longer than expected delivery timescale of HV capacitors. This request is currently under review by Ofgem.

During the reporting period the Project emphasis has focused on four key areas:

- Continued rollout of the construction phase for the trial networks
- Development of Spectrum 5 software for voltage optimisation
- Stakeholder engagement and briefings
- Direct customer engagement with those customers situated on the trial circuits.

During the reporting period the Project emphasis has focused on progressing the construction phase. From this the Project team has closely monitored the implementation of the construction plan which was designed to fit around the staged delivery timescales from the Project suppliers. The plan has been adapted and modified as required to react to both supply and technical issues as and when they have arisen. The customer workstream has been very active dealing with customer enquiries relating to the onsite build and has resolved all enquiries to date. Spectrum 5 has now been connected to the IT networks via an ICCP link and data modelling of company records into Spectrum 5 has been completed. FAT testing of the system has been completed and SAT testing has been rescheduled for December 2015.

During the next reporting period the most significant Project management activities will be:

- Ensuring the build phase is completed to the new schedule (variation request)
- Project monitoring and control
- Continued stakeholder engagement and management
- SAT testing of the SP5 operating system
- Oversee activation of the Smart Street network in the six trial areas
- Monitoring the onsite trials and data recovery for analysis by the universities.

Apart from those identified in the variation request, there are no other Project management risks or issues that are associated with delivery of a Project SDRC or maintaining consistency with the Full Submission.

2.2 Technology workstream

The most significant technology workstream activities during the reporting period are listed below:

- The Smart Street installation plan was completed and formally issued to contractors
- The LV street furniture installation phase was completed in the six trial areas
- All 498 Weezaps have been installed and commissioned
- All 42 LYNX units were commissioned but have been decommissioned to allow for a manufacturing design improvement. They will be decommissioned for the trial start date.

- All 49 end point monitors have been installed and commissioned.
- All 84 LV capacitors are installed and are being tested and commissioned to Spectrum 5.
- Three pole-mounted HV capacitors are scheduled for installation in December 2015
- Two of three ground-mounted HV capacitors are scheduled for installation in December 2015. The final HV capacitor is scheduled for installation in January 2016
- All five on-load tap changing (OLTC) distribution transformers have been installed and commissioned.

During the current reporting period there has been a significant amount of system integration testing and configuration of the SP5 system.

- Spectrum Power 5 has now been FAT tested and is ready for SAT testing. This has been postponed until December due to the supplier delays encountered during the build phase.
- A four-day workshop was held with Siemens in the Electricity North West control centre and pre-SAT work has also been conducted to reduce risks at SAT stage.
- Spectrum Power 5 has been installed onto Electricity North West's IT network
- The ICCP link between the existing network management system and Spectrum Power 5 has been established.

During the next reporting period, the technology workstream's significant activities will be:

- Installation of remaining HV capacitors
- Briefing of new policies and procedures
- Trial network commission and completion
- Trial network "go live"
- Publication of equipment specifications and installation report
- Publication of NMS, interface and optimisation configuration and commissioning report.

All SDRCs associated with the above activities are complete or on track to the revised plan.

2.3 Trials and research workstream

The most significant trials and research workstream activities during the reporting period are listed below:

- Produce a report detailing the development of the trial simulation network models.
- Produce the final trial design and test regimes report on the Smart Street website.
- The initial modelling of the HV networks has been completed and is currently undergoing sense checks with generic load profiles.
- End-to-end testing has been carried out on the Denton East trial area to confirm the accuracy of the data being received by Spectrum Power 5. Testing of the remaining areas is in progress.

All SDRCs associated with the above activities are complete or on track.

During the next reporting period, the trials and research workstream's significant activities will be:

- Commencement of live trials.
- Produce a report on the quantification of CVR benefits.
- Produce a report on the customer side impacts.

There are no trials and research risks or issues at this time that are associated with delivery of a Project SDRC or maintaining consistency with the Full Submission.

2.4 Customer workstream

The most significant customer workstream activities completed during this reporting period are listed below:

- Smart Street was briefed to the customer contact centre (CCC) to ensure the team is fully equipped to respond to general enquiries received during the trial phase of the Project. Several training sessions were delivered in June 2015, providing the opportunity for the overwhelming majority of employees to attend. Training materials were distributed to support the briefings and these were published on the Smart Street website in June. Additional mop-up sessions may be arranged to account for absences and a general Smart Street overview will be incorporated into training for new starters. Further briefing sessions requiring the involvement of the Project team will be arranged, as necessary, prior to the trial phase. This training builds on previous CCC engagement which occurred prior to the distribution of a general awareness leaflet to customers on trial circuits in October 2014; and the briefing materials issued in December 2014, prior to the installation of low voltage enabling technologies. This comprehensive engagement process with internal stakeholders has continued to ensure that all customer enquiries linked to this Project are captured and resolved appropriately
- Advisory letters have been sent to all UK suppliers to provide general information about the Smart Street Project, prior to the start of the trials. The letter outlined how Smart Street might affect their customers and extended an offer to host meetings to brief individual suppliers about the Project in greater detail. The document, which is published on the Smart Street website, provided details of the post codes covered by the trial networks and a copy of the general awareness materials sent to customers
- Since the last Project update report, there have been only two further customer enquiries directly associated with the installation of new technology, one of which has required direct intervention to modify street furniture. These enquiries have been resolved to the satisfaction of the respective customers.

During the next reporting period the customer and commercial workstream's significant activities are as follows:

- To liaise with planning engineers during the final stages the Smart Street technology build. Every effort is being made to ensure that the installation of HV enabling technologies causes the least amount of disruption to customers as possible. We anticipate that it will be possible to install this equipment without planned supply interruptions, in the same manner as was achieved during the LV construction phase. Work to install four HV pole-mounted capacitors will commence in late December and to mitigate customer impact by avoiding planned supply interruptions, this will be carried out utilising back-feeds, live-line techniques and generation. Where customers' supply is maintained by generation, they may experience a short duration interruption, of less than three minutes, while the generator is connected and subsequently disconnected on completion of the work
- In the extremely unlikely event that planned supply interruptions are unavoidable because of unforeseen eventualities, less than 150 customers will be affected. Electricity North West will manage these impacts by providing affected customers with written notification of planned outages, in accordance with standard business as usual procedures, which require two days notice. However, we will strive to provide at least seven days written notice to enable these customers to plan ahead and make alternative arrangements
- The Smart Street team has identified all vulnerable customers listed on the priority service register (PSR), residing on the affected circuits. In the event of unavoidable planned outages, these customers will be contacted by telephone, in addition to being sent written notification. This proactive approach will enable the Project team to manage the specific needs of individual customers to mitigate the impact of the planned supply interruption.

2.5 Learning and dissemination workstream

The key activities undertaken by the learning and dissemination workstream during the period are summarised below:

- On 13 October our Project Partner Siemens assisted the Project team in hosting the first of three Smart Street knowledge sharing event at their prestigious exhibition centre, The Crystal in London
- In November 2015, members of the Smart Street team attended and actively participated in the LCNI conference in Liverpool
- The second Smart Street advertorial was published in Engineering and Technology magazine in July 2015
- A Project newsletter was issued electronically to all key stakeholders in July
- The trial design and test regimes document was developed and published on the Smart Street website in October 2015
- An internal, company-wide, Project update was published on Electricity North West's intranet site (the Volt) on 25 June 2015.

Additional internal dissemination activities included:

- Smart Street was briefed to internal control teams to allow them to understand the aims of the Project and how their contribution was an important element to the successful delivery of Smart Street
- Smart Street was briefed to field operational teams in the Egremont and Wigton trial areas to allow them to understand the aims of the Project and how it would impact on their day-to-day roles. This understanding is essential for the successful delivery of Smart Street and similar sessions will be held with employees in the remaining four trial areas
- Smart Street was briefed to customer contact centre (CCC) teams to ensure they are fully equipped to record and respond to general enquiries received during the trials; and are aware of the process for escalating complex enquiries and complaints to the Project team
- Smart Street was briefed to internal fault reporting centre teams to give them an understanding of the aims of the Project and to allow them to deal with customer enquiries efficiently.

Regular updates to the Smart Street website: Throughout the reporting period, the Project website has been updated regularly with Project outputs at: www.enwl.co.uk/smartstreet.

Social media forums exploited: To ensure that the key messages from Smart Street are disseminated as widely as possible, the Project team is using a range of social media outlets to communicate Smart Street-related information, specifically:



<http://www.facebook.com/ElectricityNorthWest>



<https://twitter.com/ElectricityNW>



<http://www.linkedin.com/company/Electricity-North-West>



<http://www.youtube.com/ElectricityNorthWest>

Internal Electricity North West social media: To improve information sharing within the business, regular use is made of the internal social media application "Yammer".

In the next reporting period, the learning & dissemination workstream will undertake the following activities:

- Publish network equipment specifications and installation reports
- Publish NMS, interface and optimisation configuration and commissioning reports
- Publicise start of live trials on Smart Street website
- Publish advertorial
- Publish raw monitoring data on Smart Street website
- Submit the fifth monthly Project Progress Report to Ofgem.

There are no customer risks or issues at this time that are associated with delivery of a Project SDRC or maintaining consistency with the Full Submission.

3 CONSISTENCY WITH FULL SUBMISSION

At the end of this reporting period, it can be confirmed that the Smart Street Project is being undertaken in accordance with the Full Submission.

4 RISK MANAGEMENT

Definition of risk status

Open: Accepted risk that needs visibility until such time that it is no longer a risk to the Project. No further preventative actions identified or implemented.

Controlled: Risk with mitigating actions put in place to alleviate the possibility of an occurrence. Preventative actions identified or implemented to help manage the risk.

Closed: Potential of the risk occurring has passed or changes have been made to the Project so that there is no longer a risk.

4.1 Risks and issues experienced during reporting period

There are currently no uncontrolled risks that could impede the achievement of any of the SDRCs outlined in the Project Direction, or which could cause the Project to deviate from the Full Submission.

Risk 20 – Risk that all HV ground mounted capacitors not delivered on time. *Status: Open*

The supplier had not met the original delivery timescales which has resulted in a project extension request. A new delivery timeline has been agreed with the supplier to fit the revised project go live date. The project manager is closely monitoring this and weekly updates are being provided by the supplier.

Risk 21 – Risk that signal strength issue with LYNX devices. *Status: Controlled*

Varied signal strength was being experienced at some link box locations. Kelvatek are supplying a quantity of alternative high gain aerial's and aerial pillars for locations that have a signal strength issue.

Risk 26 – Risk that all LYNX devices are not installed by trial go live. *Status: Open*

After rollout of LYNX devices and during the testing phase, six out of the 42 units installed failed due to water ingress. All units were recovered for investigation and it was established there was a design issue that affected the bell housing of some of the units. This has been resolved by an improved bell housing design and is currently being tested. There is a risk if the new design does not pass approval tests this will delay the installation of the LYNX devices. To mitigate this risk there is a plan in place for testing and approval of the new design.

Risk 29 – Risk that the HV capacitor units will require software development. *Status: Open*

All six HV capacitors are due for installation and commissioning by January 2016. These devices have not been previously installed on the Electricity North West network. There is a risk that during testing these devices may need software development for safe integration with the Smart Street Spectrum Power 5 control system.

Risks are monitored on a continuous basis, including the potential risks that were documented in the Full Submission.

4.2 Risks that existed at time of documenting the Project Full Submission

The narrative below refers to risks that existed at the time of submission and were detailed in Appendix E of the Full Submission.

Recruitment risks

Risk 1 – Risk that Electricity North West and/or partners are not able to mobilise their resources in time. *Status: Closed*

Electricity North West has mobilised the Smart Street team; weekly and monthly Project governance meetings have been established and implemented. These include monthly updates to the sponsoring director. A comprehensive Project plan with clearly defined timescales and milestones has been agreed with Project Partners, the internal delivery team and other stakeholders. Framework agreements with clear terms and conditions have been agreed and put in place with all Partners.

Risk 12 – Risk that there may be some confusion among customers due to other ongoing government initiatives, eg The Green Deal and smart metering rollout programme. This could lead to customer engagement being adversely affected. *Status: Closed*

The Smart Street customer engagement plan is non-intrusive and simple, thus minimising the potential for confusion with other government initiatives. In addition, the Project intends to conduct engaged customer panel workshops with a representative sample of customers in order to obtain feedback on how best to inform customers of the Project and how it may affect customers.

Procurement risks

Risk 4 – Risk that a lack of suitable equipment vendors may result in a poor response to invitations for tenders. *Status: Closed*

The Project's request for information during the development of Smart Street showed that products are available from a number of vendors, but some products require further development. The initial response to the tender process was good and no problems were envisaged. An expression of interest was issued through Achilles (utilities vendor database) for the procurement of LV capacitors, HV pole-mounted capacitors and HV ground-mounted capacitors with four vendors responding positively. The ITT documents were issued. All equipment orders were placed in good time and there was an agreed schedule of delivery dates with all suppliers in place. After delivery issues with suppliers, notably ABB, all equipment has now been delivered.

Risk 5 – Risk that actual product delivery lead times may be greater than planned. *Status: Closed*

Clearly defined timescales were included in all vendor agreements to ensure that Project timescales were met. In addition, the evaluation criteria for procurement activities include weighting for delivery timescales. This was to ensure that a suitable product could be procured within the required timescales of the Project. The construction build plan was

designed in such a way that the equipment with the longest lead times will be installed at the later stages of the build in order to minimise the risk of delays.

Installation risks

Risk 2 – Risk that following preliminary design, planning issues where equipment is proposed to be located could lead to extended consultation requirements.

Status: Closed

Electricity North West engaged early in the Project to inform customers of local work, thus minimising the risk of objections. Furthermore, any installation of equipment was planned to minimise intrusion and disturbance, while maximising the benefits. Physical size of equipment and location were considered to prevent issues further into the installation programme.

Due to the larger than originally anticipated physical size of the HV ground-mounted capacitors, an issue arose whereby these units needed to be sited outside of the associated substations. This was identified at an early stage and the Project team entered into discussions with the relevant land owners. All sites have now been secured.

Risk 6 – Risk that the vendor does not achieve delivery and installation of the optimisation software or that there are potential constraints with Electricity North West's NMS configuration and commissioning. *Status: Closed*

Early contact was made with Siemens for discussion and agreement to deliver the software according to the Project plan. Through this, an understanding of the data requirements and connectivity between the optimisation software and Electricity North West's NMS system was agreed at an advanced stage. In addition, since Project go live, significant effort was invested in finalising functional requirements prior to signing contracts with Siemens. This is aimed at de-risking Project delivery.

Weekly meetings are held with Siemens to address any actions and issues and have resulted in good progress on what is a complex element of the Project. Siemens are now in a position to carry out SAT testing in mid-December.

Risk 7 – Risk that new technologies or software installed do not perform as expected in the commissioning stage leading to delays to commencing the trial and potentially affecting the quality of Smart Street outputs. *Status: Open*

Smart Street equipment technologies have been trialled and proven under previous IFI and first tier LCN Fund projects; or proven in business as usual scenarios. In addition, early commissioning dates allow for contingent time should this risk materialise.

Some issues have arisen during commissioning as Smart Street is the first instance of these technologies being used together as a complete system. These issues are currently being worked on and an individual plan is in place to resolve each one to a satisfactory outcome within the new Project timescales.

Other risks

Risk 3 – Risk that the trial areas selected will not include areas with CLASS or C₂C leading to a lost opportunity to gain further value from utilising existing assets.

Status: Closed

The selection criteria outlined in Appendix B of the Full Submission has been applied to the selected circuits with priority applied to CLASS and C₂C assets. The circuit selection criteria were designed to utilise existing trial networks where practicable and only where there are other factors that prevent overlap with CLASS or C₂C have alternate circuits been included. Of the 11 HV circuits selected three overlap with CLASS and eight overlap with C₂C.

Risk 8 – Risk that customers in the trial areas perceive a change to their electricity supply leading to hypothesis failure and potential adverse publicity for Smart Street. Status: Open

As part of proving the hypothesis that no change will be perceived by customers, the Project team will carry out ongoing monitoring via the customer contact centre. Following any notification of a perceived change, extra monitoring equipment will be installed to validate the claim and ensure that the perceived change is not due to the customer being sensitised to the trial. In addition, the customer surveys designed for CLASS include control groups that can be used to benchmark any survey responses that are obtained from the trials. To further qualify the customer experience, focus groups will be held in the latter part of the second year of the trial period with customers from each of the Smart Street trial locations.

Risk 9 – Risk that the survey group does not form a representative sample of either the Electricity North West or GB customer base. Status: Closed

We will be leveraging previous second tier surveys that will establish customer perception of changes in the power quality. Customers recruited for the second tier surveys and Smart Street trial surveys will be representative of the wider population at both Electricity North West and GB level and be matched by ACORN classification.

Risk 10 – Risk that some industrial customers have transformer winding ratios of 11000/400 leading to out of limit voltages on their networks. Status: Closed

A search for potential HV customers in trial areas will be conducted. If any are found they will be informed of the Smart Street trials in order to ensure appropriate actions are taken to avoid out of limit voltages on their premises.

Risk 11 – Risk that external factors, not directly influenced by the trials or related to Smart Street, could cause customers to become negative towards Electricity North West or LCN Fund projects. Status: Open

The Smart Street Project team are working closely with the Electricity North West press office to identify any potential issues and formulate targeted communications to proactively minimise any adverse impacts to Smart Street.

Risk 13 – Risk that the University of Manchester or Queen's University, Belfast undergo personnel changes during the Project, leading to loss of specific skills which could impact the quality of deliverables. Status: Controlled

Work packages agreed with the universities have defined the tasks for which each university is responsible. All research activities are being undertaken in a collaborative manner, with the involvement of multiple individuals across both academic institutions in order to minimise the risks associated with the movement of research staff.

Risk 14 – Risk that the high volume of LCN Fund events will dilute the effectiveness of dissemination activities leading to lower than expected value derived from Smart Street being achieved. Status: Controlled

Strong Project branding has been developed along with key messages and high quality dissemination materials to ensure that Smart Street is clearly differentiated and reaches the right audience. Choice of dissemination media is being optimised to achieve maximum reach and coverage. Throughout the Project the learning and dissemination approach will be tailored to meet the needs of each stakeholder group. In addition to the publication of learning materials through social media and online, industry wide and bespoke knowledge sharing events will take place.

Risk 15 – Risk that the varied interests of the stakeholders prevents knowledge from being disseminated effectively leading to the learning outcomes from Smart Street not being maximised. *Status: Open*

During the Smart Street mobilisation, multiple communication channels and a range of stakeholders have been identified to maximise Smart Street dissemination outcomes. A Smart Street Project Partner event has been held to open communication channels between all parties and this will be followed by quarterly steering group meetings. Dissemination of knowledge forms a key part of each Project steering group to ensure all internal stakeholders are aware of the outcomes of the Project.

5 SUCCESSFUL DELIVERY REWARD CRITERIA

During the reporting period, eight planned SDRCs were delivered. This is detailed in table 5.1 below. Completion dates have been updated in line with requested variation.

Table 5.1: SDRC delivered in reporting period

Milestone	Workstream	Completion date
Publish LV network management protocols by June 2015	Technical	June 15
Electricity North West operational personnel, including control engineers briefed and/ or trained on LV network management protocols by June 2015	Technical	June 15
Publicise Smart Street within Electricity North West monthly team brief pack and Volt (intranet) and/ or Newswire (bimonthly employee magazine) by June 15	Dissemination	June 15
Project Progress Reports published on Smart Street website June 2015	Project management	June 15
Customer contact centre training delivered and materials published on the intranet by July 2015	Customer	July 15
Publish advertorials by July 2015	Customer	July 15
Host Smart Street knowledge sharing event	Dissemination	October 15
Active participation at the annual LCNI conference 2015	Project management	November 15

The SDRC planned for the next reporting period can be seen in table 5.2 below.

Table 5.2: SDRC look ahead

Milestone	Workstream	Completion date
Project Progress Reports published on Smart Street website December 2015	Project management	December 15
Confirmation received from University of Manchester and Queen’s University Belfast confirming successful receipt of/completion of data transfer process by September 2015	Research/trials	January 16

Milestone	Workstream	Completion date
Publish network equipment specifications and installation reports by September 2015	Technical	January 16
Publish NMS, interface and optimisation configuration and commissioning reports by September 2015	Technical	January 16
Publicise commencement of live trial on Smart Street website by September 2015	Dissemination	January 16
Publish trials and test regimes design report on Smart street website	Research/trials	February 16
Publish advertorials	Customer	February 16
Raw monitoring data is available via Smart Street website by December 2015	Research/trials	April 16

During the next reporting period four of the SDRCs are forecast to be delivered at variance to the dates contained within the original Project plan appended to the Full Submission.

6 LEARNING OUTCOMES

A Project website has been established as a repository for sharing Project learning to interested stakeholders. The learning outcomes during the period are described below.

Lesson 1: Use of Smart Street team to deal directly with customer enquiries

Background: Smart Street technology installation, specifically on the LV network, has been more apparent to customers than new technologies associated with previous LCN Fund projects. As referenced during the last reporting period, this has resulted in a small amount of resistance to new street furniture housing LV enabling technologies, on the grounds of visual amenity. New street furniture may also have exacerbated existing anti-social behaviour and nuisance problems in a small number of locations.

Lessons learned: All customer concerns are addressed quickly, sensitively and appropriately. The Project team will continue to handle all customer enquiries associated with Smart Street. This will ensure all issues are resolved to the customer's satisfaction and do not introduce any risk to the Project in terms of slippage or reputation. The Project team will continue to work closely with the customer contact centre to ensure all customer enquiries are captured, recorded and referred to a designated person within the Project team, who will liaise directly with customers on an individual basis.

Lesson 2: Inconsistencies in the accuracy of LV network records

Background: The accuracy of historic LV records can never be certain. This is due to a number of factors such as the transition from paper-based records to electronic versions, poor reporting of network changes etc. For the correct implementation of Smart Street these inaccuracies had to be identified and corrected. Failure to do so could have a negative effect on network control and optimisation.

Lessons learned: The Smart Street LV network was surveyed. The network configuration was compared to records and all Smart Street LV circuits were traced using Kelvatek's 'Re-trace' equipment. All network configurations were updated on Electricity North West network records.

Lesson 3: Understanding the physical limitations of new equipment

Background: The ground-mounted HV capacitors being installed for Smart Street are a new design and are sited in a very different environment from previous installations. Due to installation in urban areas these units are at a higher risk of vandalism. All three ground-mounted HV capacitors will be installed in a specially designed secure glass reinforced plastic (GRP) housing. This further increased the footprint of these already sizeable units.

This in turn required work with land owners and local authorities to agree wayleaves and planning permission.

Lessons learned: For new equipment, visiting either existing installations or the manufacturer to understand equipment specifications, size and suitability for installation is essential.

Working with the manufacturer and raising possible issues at an early stage is crucial to the development of the equipment to meet new limitations or requirements

Lesson 4: Phased installation and testing period before rollout

Background: The equipment installed in Smart Street has all been tested prior to Project go live in various scenarios. When integrating all this equipment together issues arise, development work is carried out and improvements are made. If all devices are installed and a configuration or software upgrade is required, this could take time re-visiting sites.

During the construction, installation and commissioning of the Smart Street trial networks the Project team have always kept one smaller trial area, Denton East at an advanced stage to the other areas. This allowed for early integration tests, development work and end-to-end tests to be carried out before rolling out on all trial areas.

Lessons learned: By having one small trial network progressed at a faster rate than other trial networks we have been able to identify possible risks and issues at an early stage. Any issues or risks identified can then be investigated and resolved in a controlled process. All development is then rolled out to all trial networks before trial go live, therefore reducing site visits and overall Project costs.

Lesson 5: Co-ordination of testing and installation activities

Background: While the Project technologies had been proven in previous tier one projects, Smart Street marked the first instance of them being used as an integrated system. As such it was necessary to fully test the functionality of both the devices and the system as a whole. This required expertise from other sections of the business outside the Project team, which was not always available, leading to repeated visits and delays once issues were encountered. This was especially evident in the initial stages of the work where firewall issues etc meant that not all testing was possible during the installation visit.

Lessons learned: In order to maximise the efficiency of the site work it is advised that installation and commissioning work is closely co-ordinated, both internally to the Project and with the appropriate external departments and partners. This should ensure that sufficient expertise is available to either resolve or identify the cause of any arising issues and as such minimise the need to repeatedly visit sites.

7 BUSINESS CASE UPDATE

Electricity North West is not aware of any developments that have taken place since the issue of the Project Direction that affect the business case for the Project.

8 PROGRESS AGAINST BUDGET

The original Project budget as defined in the Project Direction is shown in Appendix A.

Project expenditure compared to baseline forecast is summarised below at the cost category level and in Appendix B at Project activity level. The report includes expenditure up to and including 30 November 2015.

Table 8.1: Project expenditure

£'000s Excluding Partner Funding Ofgem Cost Category	Spend to date			Total Project			
	Actual	Plan	Variance	Forecast	Plan	Variance	%
Labour	1,062	1,170	108	1,982	1,888	-94	-5%
Equipment	2,754	3,089	334	3,276	3,235	-42	-1%
Contractors	1,068	1,381	313	2,004	1,960	-44	-2%
IT	895	1,090	195	1,164	1,090	-74	-7%
Contingency	0	950	949	0	1,015	1,015	100%
Decommissioning	0	0	0	39	39	0	0%
Other	112	122	11	327	323	-3	-1%
Total	5,890	7,801	1,911	8,792	9,550	758	8%

The actual spend to date is £5,890k and the estimate at completion cost is now £8,792k.

The phased mobilisation of the Project and subsequent invoicing from suppliers has resulted in a realignment of the expenditure during the construction phase of the Project. This has resulted in a £1,911k variance spend to date including contingency to the original Project budget. It is forecast that spend will closely align with the Project budget by the end of the first quarter 2016 when the construction phase will be completed. The Project manager has already seen evidence of this happening with the under spend significantly reducing since the previous six-monthly report.

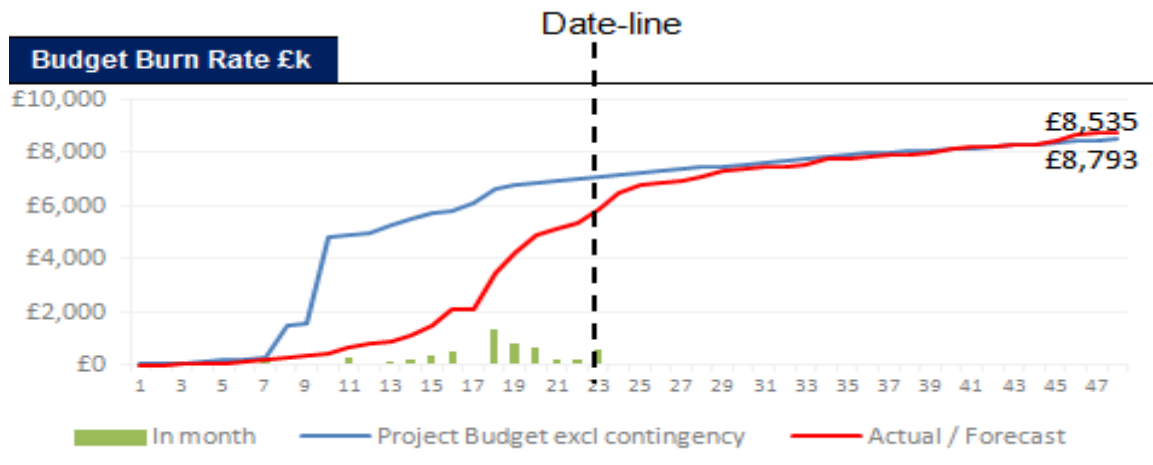
The £108k variation in labour costs is due to the HV capacitor work being rescheduled towards the end of the construction phase.

The £334k equipment variance is due to the staged delivery of the equipment and final invoicing. All equipment has now been delivered and we are awaiting final invoicing from our suppliers.

The £313k variation in contractor costs is primarily due to the HV capacitor work being rescheduled towards the end of the construction phase in late December and early January. We are also awaiting invoicing for part of the construction work carried out to date by our contractors.

The £195k IT variance is primarily due to enhancements and testing being made to the system prior to delivery, thus reducing the likelihood of onsite risks and issues developing after installation. This approach has resulted in later payment to the supplier than originally forecast.

While confirmation to the variation request is awaited, Project finances are shown as overspends by cost category rather than spend of contingency.



The estimated at completion forecast is currently expected to remain within the original budget of £9,550k including contingency. The Project bank statement is shown in Appendix C. The statement contains all receipts and payments associated with the Project up to the end of November 2015.

9 INTELLECTUAL PROPERTY RIGHTS (IPR)

Electricity North West is following the default IPR arrangements. The company's IPR approach has been considered in line with current period Project deliverables and it has been concluded that the default IPR arrangements apply.

10 OTHER

There is no other information at this time that would be of use to Ofgem in understanding the progress of the Project and performance against the SDRCs.

11 ACCURACY ASSURANCE STATEMENT

The Project team and select members of the Smart Street Project steering group, including the lead member of the bid development team have reviewed this report to ensure its accuracy.

The financial information has been produced by the Smart Street Project manager and the Project's finance representative who review all financial postings to the Project each month. This ensures that postings have been correctly allocated to the appropriate Project activity. The financial information has also been peer-reviewed by the Electricity North West distribution finance business partner. Issue of the document has been approved by the Innovation Delivery Manager.

APPENDIX A – PROJECT DIRECTION PROJECT BUDGET

£000's	
Excluding Partner Funding	
Ofgem Cost Category	
Labour	1,888
HV & LV Network Management & Interconnection - Labour	305
Network Configuration & Voltage Optimisation - Labour	431
Project Management, Planning, Policy and Training - Labour	1,152
Equipment	3,235
Data Preparation - Equipment	285
HV & LV Network Management & Interconnection - Equipment	2,229
HV & LV Voltage Control - Equipment	721
Contractors	1,960
Customer Engagement & Survey - Contractors	110
HV & LV Voltage Control - Contractors	350
LV Network Management & Interconnection - Contractors	161
Network Configuration & Voltage Optimisation - Contractors	381
Peer reviews, support & customer research - Contractors	142
Research -Technical - Contractors	626
Research - CBA & CIA - Contractors	189
IT	1,090
Network Configuration & Voltage Optimisation - IT	1,090
Contingency	1,015
HV & LV Network Management & Interconnection - Contingency	272
HV Voltage Control - Contingency	426
Dissemination, Policy, Training & Trials - Contingency	82
Network Configuration & Voltage Optimisation - Contingency	235
Decommissioning	39
Decommissioning	39
Other	323
Technology build and Trials data - Other	87
Learning & Dissemination - Other	133
Accommodation - Other	103
Total	9,550


Source: Ofgem Schedule to Project Direct - December 2013

APPENDIX B – DETAILED PROJECTED PROJECT EXPENDITURE

£'000s Excluding Partner Funding Ofgem Cost Category	Spend to date			Total Project				Comments
	Actual	Plan	Variance	Forecast	Plan	Variance	Variance %	
Labour	1,062	1,170	108	1,982	1,888	(94)	-5%	
HV & LV Network Management & Interconnection - Labour	159	305	146	316	305	(11)	-4%	
Network Configuration & Voltage Optimisation - Labour	341	363	22	442	431	(11)	-3%	
Project Management, Planning, Policy and Training - Labour	561	502	(59)	1,224	1,152	(72)	-6%	£64,000 overspend identified in extension request
Equipment	2,754	3,089	334	3,276	3,235	(42)	-1%	
Data Preparation - Equipment	0	168	168	273	285	12	4%	
HV & LV Network Management & Interconnection - Equipment	2,153	2,200	47	2,230	2,229	(1)	0%	
HV & LV Voltage Control - Equipment	601	721	120	773	721	(52)	-7%	modifications required to capacitors
Contractors	1,068	1,381	313	2,004	1,960	(44)	-2%	
Customer Engagement & Survey - Contractors	62	59	(3)	111	110	(1)	-1%	
HV & LV Voltage Control - Contractors	313	350	37	353	350	(3)	-1%	
LV Network Management & Interconnection - Contractors	162	161	(2)	162	161	(2)	-1%	
Network Configuration & Voltage Optimisation - Contractors	388	368	(20)	422	381	(41)	-11%	Variance due to modifications & enhancements associated to on site equipment issues
Peer reviews, support & customer research - Contractors	22	62	40	142	142	(0)	0%	
Research -Technical - Contractors	121	256	135	623	626	3	0%	
Research - CBA & CIA - Contractors	0	125	125	190	189	(0)	0%	
IT	895	1,090	195	1,164	1,090	(74)	-7%	
Network Configuration & Voltage Optimisation - IT	895	1,090	195	1,164	1,090	(74)	-7%	Variance due to modifications & enhancements required for onsite communication issues
Contingency	0	950	949	0	1,015	1,015	100%	
HV & LV Network Management & Interconnection - Contingency	0	267	267	0	272	272	100%	
HV Voltage Control - Contingency	0	426	426	0	426	426	100%	
Dissemination, Policy, Training & Trials - Contingency	0	22	22	0	82	82	100%	
Network Configuration & Voltage Optimisation - Contingency	0	235	235	0	235	235	100%	
Decommissioning	0	0	0	39	39	0	0%	
Decommissioning	0	0	0	39	39	0	0%	
Other	112	122	11	327	323	(3)	-1%	
Technology build and Trials data - Other	0	32	32	87	87	1	1%	
Learning & Dissemination - Other	58	49	(10)	138	133	(5)	-4%	
Accommodation - Other	53	41	(12)	102	103	1	1%	
Total	5,890	7,801	1,911	8,792	9,550	758	8%	

APPENDIX C – PROJECT BANK ACCOUNT

The bank statement below details all transactions relevant to the Project up to 30 November 2015. This includes all receipts and payments associated with the Project up to the November 2015 month end reporting period.

 Lloyds Bank		Yesterday's Statement	C082421			
Statements and Balances						
ELECTRICITY NWL NO.13 LCNF (SMART) (GBP)						
Date	Type	Narrative	Value Date	Payments	Receipts	Balance
01JUN15		Opening Ledger Balance				8,306,873.40 Cr
09JUN15	CR	INTEREST (GROSS)			3,299.99	8,310,173.39 Cr
09JUL15	CR	INTEREST (GROSS)			3,415.14	8,313,588.53 Cr
10AUG15	CR	INTEREST (GROSS)			3,639.05	8,317,227.58 Cr
10AUG15	DR	TO A/C TFR		384,378.43		7,932,849.15 Cr
11AUG15	DR	TO A/C TFR		542,508.94		7,390,340.21 Cr
12AUG15	DR	TO A/C TFR		35,542.88		7,354,797.33 Cr
13AUG15	DR	TO A/C TFR		1,326,377.65		6,028,419.68 Cr
14AUG15	DR	TO A/C TFR		793,124.62		5,235,295.06 Cr
09SEP15	CR	INTEREST (GROSS)			2,220.91	5,237,515.97 Cr
02OCT15	DR	TO A/C TFR		3,639.05		5,233,876.92 Cr
09OCT15	CR	INTEREST (GROSS)			2,152.01	5,236,028.93 Cr
09NOV15	CR	INTEREST (GROSS)			2,223.52	5,238,252.45 Cr
30NOV15		Value of Credits (6)			16,950.62	
30NOV15		Value of Debits (6)		3,085,571.57		
30NOV15		Closing Ledger Balance				5,238,252.45 Cr
30NOV15		Closing Cleared Balance				5,238,252.45 Cr

*** End of Report ***