

The logo for Electricity North West, featuring the word "electricity" in blue and "north west" in green, with a stylized green leaf icon to the left.

Bringing energy to your door

Smart Street

Project Progress Report (PPR)

Version 1.0

June 2015

A white sign with a green border and the words "SMART STREET" in bold green capital letters, supported by two white posts.

## VERSION HISTORY

Version	Date	Author	Status	Comments
1.0	12 June 2015	K Hoban	1 <sup>st</sup> Issue	

## APPROVAL

Name	Role	Signature & date
Paul Bircham	Regulation Director	
Steve Cox	Head of Network Engineering	
Paul Haigh	Finance Business Partner	<p>SIG: </p> <p>DATE: 12.06.15.</p> <p>NAME: PAUL HAIGH.</p>

# CONTENTS

- Version history.....2
- Approval.....2
- Glossary of terms .....4
- 1 Executive summary.....5
- 2 Project manager’s report.....8
  - 2.1 General Project management .....8
  - 2.2 Technology Workstream .....8
  - 2.3 Trials and Research Workstream.....9
  - 2.4 Customer Workstream .....9
- 3 Consistency with full submission .....10
- 4 Risk management .....10
  - 4.1 Risks and issues experienced during reporting period .....10
  - 4.2 Risks that existed at time of documenting the Project Full Submission.....10
- 5 Successful delivery reward criteria .....13
- 6 Learning outcomes.....14
- 7 Business case update .....16
- 8 Progress against budget.....16
- 9 Intellectual Property Rights (IPR) .....17
- 10 Other .....17
- 11 Accuracy assurance statement.....17
- APPENDIX A – Project direction Project Budget .....18
- APPENDIX B – detailed projected Project expenditure.....19
- APPENDIX C – Project bank account.....20

## GLOSSARY OF TERMS

Abbreviation	Term
C <sub>2</sub> C	Capacity to Customers (Electricity North West Second Tier Project)
CEP	Customer Engagement Plan
CLASS	Customer Load Active System Services (Electricity North West Second Tier 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
LV	Low Voltage
NMS	Network Management System
ITT	Invitation To Tender
NMS	Network Management System
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 today 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 C<sub>2</sub>C Project, and elements of the voltage control technologies developed within Electricity North West's LCNF First Tier programme. 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.

Smart Street Project will employ these techniques to demonstrate that a network operator can quickly release capacity and voltage headroom to facilitate the connection of LCTs and at the same time operate a cost, carbon and energy efficient distribution network. The themes of LV network management and interconnection, HV and LV voltage control, and network configuration and voltage optimisation are the key interlinking aspects of the Smart Street Method.

Enhancing existing networks in this way enables accelerated connection of clusters of low carbon technologies 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 low carbon technology 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 within 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 costs to date are £2106k and the estimated completion cost is in line with the Project budget excluding contingency. This report is the third Project progress report and covers the period December 2014 to May 2015 inclusive. The Project is on track and key highlights to date are:

## **Installation Plan**

- 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.

## **Spectrum Power 5**

- Initial training on the Spectrum Power 5 operating system was carried out by both expert users and data maintainers.

- 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.

### **Trials and Research**

- The trials and test regimes design has been developed including a detailed test schedule.
- The research work packages have been agreed with the universities and a methodology has been developed for modelling the trial networks. The initial modelling of the LV trial networks is complete.

### **Customer engagement**

- Properties in sight of new enabling technologies and those likely to be subject to short term inconvenience associated with construction work were identified. Approximately 1,500 advisory letters were posted to these customers.
- A total of 27 customer enquiries (25 directly attributable to LV technology installation) were received and amicably resolved during the period. These were handled on a case by case basis and involved written and verbal communication along with on-sites meetings, where individual customers' concerns were discussed to reach the most appropriate outcome

During the reporting period the Project has delivered 2 SDRC outputs, detailed in section 5.

*Table 1.1 SDRCs delivered during the reporting period*

Milestone	Workstream	Completion date
Project progress reports published on Smart Street website	Project Management	December 14
Second Smart Street webinar held	Dissemination	April 15

During the next reporting period the Project will

*Table 1.2 SDRCs delivered during the next reporting period*

Milestone	Workstream	Completion date
Publish LV network management protocols by June 2015	Technical	June 15
ENWL 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 staff 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
Publish network equipment specifications and installation reports by September 2015	Technical	September 15
Publish NMS, interface and Optimisation configuration and commissioning reports by September 2015	Technical	September 15
Publicise commencement of live Trial on Smart Street website by September 2015	Dissemination	September 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	September 15

Host Smart Street knowledge sharing event	Dissemination	October 15
Publish Trials and test regimes design report on Smart street website.	Research/Trials	October 15
Publish advertorials.	Customer	October 15
Active participation at the Annual LCN Fund Conference 2015.	Project Management	October 15

### 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. A number of inaccuracies were highlighted when network diagrams were compared with the network model.
- Early identification of, and engagement with those customers most directly affected by the installation of enabling technology and new street furniture is critical in achieving customer buy-in. This mitigates the risk of complaints and provides sufficient opportunity to modify the technical design, if necessary, thus negating costly post construction redesign and installation costs.
- A fully embedded complaints process, managed centrally by designated members of the Project team, provides the most effective means of ensuring any customer concerns are addressed quickly and appropriately, maintaining good customer relationships.

*Table 1.2 Third party dissemination activities*

Event	Contribution	Date
Presented Smart Street overview to the IET and Kendal Engineering Society	Presented	February 15
Smart Street video promoted on Twitter	Media	February 15
Smart Street video promoted on Twitter	Media	April 15
Smart Street webinar promoted on Linked In via Low Carbon Networks Forum	Media	April 15
Second webinar held	Presented	April 15

### Internal dissemination activities

- Smart Street was briefed to Estates and Wayleaves staff to allow them to engage with landowners and customers from a position of knowledge and understanding.
- Smart Street was briefed to internal IT staff 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.
- Staff were updated via Yammer (A private social network for all employees) on the webinar and informed how to view the recording of the event.
- Two Smart Street policy workshops were held with the System Operations team and Policy team. This was to update existing policies and to agree the correct process to introduce Smart Street policies and procedures to the wider business.

## 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 second Project webinar.

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

- Development of Spectrum 5 software for voltage optimisation.
- Continued roll out of the construction phase for the trial networks.
- 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 construction phase of the project. From this the Project team has engaged with Electricity North West's operations business and issued the construction plan which is designed to fit around the staged delivery timescales from the Project suppliers. The customer workstream has been very active dealing with customer enquires 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 also progressed. A number of employees including data maintainers, control room users and Smart Street team experts have completed their training on the Siemens training on the Spectrum 5 software.

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

- Project monitoring and control.
- Continued stakeholder engagement and management.
- FAT testing of the SP5 operating system.
- Oversee activation of the Smart Street network in the six trial areas.
- Active participation at Annual Low Carbon Networks & Innovation Conference.

There are no 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:

- Installation on site of LV capacitors and End Point monitors completed.
- Trial circuit link box refurbishment completed.
- Network model built in SP5.
- Spectrum 5 installed on Electricity North West network.
- ICCP link between SP5 and Electricity North West NMS established.

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

During the current reporting period there has been a significant amount of work carried out on the installation and configuration of the SP5 system onto Electricity North West IT network.

Additional to this a significant portion of the construction programme is now complete.

During the next reporting period, the Technology Workstream's significant activities will be:

- Approval of new Policies and Procedures.
- Roll Out of Weezap and Lynx devices.
- Installation of 7 HV Capacitors.
- Installation of 5 OLTC transformers.
- Trial network commission and completion.
- Trial network "Go live".

There are no Technology Workstream risks or issues that are associated with delivery of a Project SDRC or maintaining consistency with the Full Submission.

### **2.3 Trials and Research Workstream**

The most significant Trials and Research Workstream activities during the reporting period are listed below:

- The first draft of Smart Street trial design & test regimes report has been developed and circulated around the research project partners for comments. TNEI have carried out an initial peer review of the report.
- Production of a literature survey of CVR and voltage optimisation methodologies. (Deliverable 1.1.1)
- Production of an interim report on the network modelling methodology. This describes the process used to generate LV network models in OpenDSS from Electricity North West network management data such as CRMS and PGIS.
- The LV network design has been completed. These networks have been modelled in OpenDSS and are currently being validated by UoM.

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:

- Publish the final trial design & test regimes report on the Smart Street website (SDRC 9.2.1)
- Commencement of live trials (SDCR9.2.2)
- Produce a report detailing the development of the trial simulation network models (Research Deliverable 1.1.2)
- Produce a report on the adopted methodology and simulation framework, including initial results (Research Deliverable 2.1)

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 during the reporting period are listed below:

- Properties in sight of proposed new street furniture in the public footpath, designed to house enabling technology, were identified and notification letters sent.
- Process embedded for handling customer enquiries and complaints linked to technology installation and associated issues.

During the next reporting period the Customer and Commercial Workstream's significant activities will be:

- Design training materials and commence briefing of customer contact centre employees.

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.

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**

#### **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.

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: Controlled**

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 amongst customers due to other ongoing government initiatives, e.g. The Green Deal and smart metering rollout program. This could lead to customer engagement being adversely affected. Status: Controlled**

The Smart Street customer engagement plan is both 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 has been good and no problems are

envisaged. An expression of interest has already been 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 have now been issued. All equipment orders have now been placed and there is an agreed schedule of delivery dates with all suppliers in place.

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

**Status: Controlled**

Clearly defined timescales have been included in all vendor agreements to ensure that Project timescales are met. In addition, the evaluation criteria for procurement activities include weighting for delivery timescales. This will ensure that a suitable product can be procured within the required timescales of the Project. The construction build plan has been 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: Open**

Electricity North West will engage early to inform customers of local works, thus minimising the risk of objections. Furthermore, any installation of equipment will be planned to minimise intrusion and disturbance, while maximising the benefits. Physical size of equipment and location will be 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 has arisen whereby these units need to be sited outside of the associated substations. This has been identified at an early stage and the Project team are currently in discussions with the relevant land owners. To date all but one site has been secured and negotiations are at an advanced stage on this remaining site.

**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: Open**

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 has been agreed at an advanced stage. In addition, since Project go-live, significant effort has been 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.

**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**

All Smart Street equipment technologies have been trialled and proven under previous IFI and LCNF Tier 1 funded projects; or proven in business as usual scenarios. In addition early commissioning dates have been planned to allow contingent time should this risk materialise.

### **Other Risks**

**Risk 3: Risk that the Trial areas selected will not include areas with CLASS or C<sub>2</sub>C 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 C<sub>2</sub>C 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 C<sub>2</sub>C have alternate circuits been included. Of the 11 HV circuits selected three overlap with CLASS and eight overlap with C<sub>2</sub>C.

**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: Controlled**

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: Controlled**

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 in order to ensure all internal stakeholders are aware of the outcomes of the Project.

## 5 SUCCESSFUL DELIVERY REWARD CRITERIA

During the reporting period, two planned SDRC's were delivered. This is detailed in table 5.1 below.

*Table 5.1 SDRC delivered in reporting period*

Milestone	Workstream	Completion date
Project progress reports published on Smart Street website	Project Management	December 14
Second Smart Street webinar held	Dissemination	April 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
Publish new LV network management protocols by June 2015	Technical	June 15
ENWL 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 staff 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

Milestone	Workstream	Completion date
Publish network equipment specifications and installation reports by September 2015	Technical	September 15
Publish NMS, interface and Optimisation configuration and commissioning reports by September 2015	Technical	September 15
Publicise commencement of live Trial on Smart Street website by September 2015	Dissemination	September 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	September 15
Host Smart Street knowledge sharing event	Dissemination	October 15
Publish Trials and test regimes design report on Smart street website.	Research/Trials	October 15
Publish advertorials.	Customer	October 15
Active participation at the Annual LCN Fund Conference 2015.	Project Management	October 15

During the next reporting period none of the SDRCs are forecast to be delivered at variance to the dates contained within the 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:** To ensure any customer concerns were addressed quickly, efficiently and sensitively a complaints process was embedded and each enquiry was handled on a case by case basis by a designated member of the Smart Street customer workstream. This process allowed customer objections to be resolved appropriately, prior to commencing installation works.

**Lessons learned:** This proactive customer strategy was successful in fully engaging with all customers directly impacted by new technology installation work; reduced the number of anticipated enquiries; maintained a good relationship and facilitated an amicable resolution in cases where customers had raised concerns or objections; allowed sufficient time to modify the technical design, where appropriate, prior to installation works, negating costly post construction redesign costs.

It is essential that the customer contact centre are fully aware of the Project and the need to immediately forward enquiries directly to the Project team as delays or misinformation leads to greater customer dissatisfaction and ultimately decreases the chances of reaching a satisfactory resolution with the customer.

### 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: Proactive customer engagement is required, additional to general awareness material, where new enabling technology is installed in sight of properties**

#### **Background**

Customers are unlikely to welcome new street furniture in sight of their property and a degree of resistance had been anticipated in some residential areas to the installation of new enabling technology housed in metal cabinets in the public footpath, namely LV Capacitors and End Point Controllers. A comprehensive planning exercise, including on-site surveys, established not only connection feasibility and compliance with Smart Street technical design criteria, but ensured each new piece of street furniture was installed in the least obtrusive position for customers.

Cabinets housing LV Capacitors and End point Controllers are generally visible to between 4 and 6 residents. These customers received the general customer awareness leaflet, distributed in October 2014 but Electricity North West recognised the importance of additional customer engagement with those most directly impacted.

It was not feasible or practical to consult with property owners on an individual basis and therefore pre-construction consultation took the form of letters, sent to customers whose home and business premises were in the immediate vicinity or in sight of Smart Street enabling technology.

To ensure any customer concerns were addressed quickly, efficiently and sensitively a complaints process was embedded and each enquiry was handled on a case by case basis by a designated member of the Smart Street customer workstream. This process allowed customer objections to be resolved appropriately, prior to commencing installation works. This proactive customer strategy was successful in fully engaging with all customers directly impacted by new technology installation work; reduced the number of anticipated enquiries; maintained a good relationship and facilitated an amicable resolution in cases where customers had raised concerns or objections; allowed sufficient time to modify the technical design, where appropriate, prior to installation works, negating costly post construction redesign costs.

#### **Learning outcome**

Early and proactive engagement with those customers most directly affected by the installation of new street furniture is critical in achieving customer acceptance; mitigates the risk of complaints and provides sufficient opportunity to modify the technical design, most economically, in circumstances where public discord necessitates compromise in the positioning of new technology. Further to this early engagement gives maximum timescales to reach resolutions without adversely impacting on the construction phase.

### **Lesson 4: Resolution of customer installation enquiries / complaints**

A total of 27 customer enquiries were received following the distribution of the targeted advisory letter to properties in sight of new street furniture, all of which were domestic. As could reasonably have been anticipated, socio economic factors appear influential in public resistance to new street furniture and public opposition was largely from the more affluent residential areas. Objections fell into the following categories:

- General visual amenity;
- Perceived risk of anti social behaviour, where residents considered street furniture might pose a potential congregation point for local youths;
- Concerns about impaired access to property

Because of the electrically dependent position of new technologies to meet the project's technical design criteria, alternative locations and redesign options were extremely limited. Customers were generally found to be accepting of new street furniture once the project's objectives had been explained.

### Learning outcome

All practicable alternatives were considered to reach a mutually agreeable resolution to objections, which addressed both customer concerns and sensitivity along with the design criteria. Where existing network configuration permitted, we amended the construction plans and installed street furniture in an alternative position. Five cabinets were repositioned however; this was not possible in the case of every objection.

In each instance, the revised plan involved moving equipment only a few meters from the position originally proposed. There was no requirement to abandon any proposed installation on the grounds of a customer complaint.

Sloping lids have been constructed and retrofit onto the existing flat tops of cabinets in areas where anti social behaviour concerns were raised. This was done to prevent the units being used as a seating point for youths to congregate.

## 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 31 May 2015.

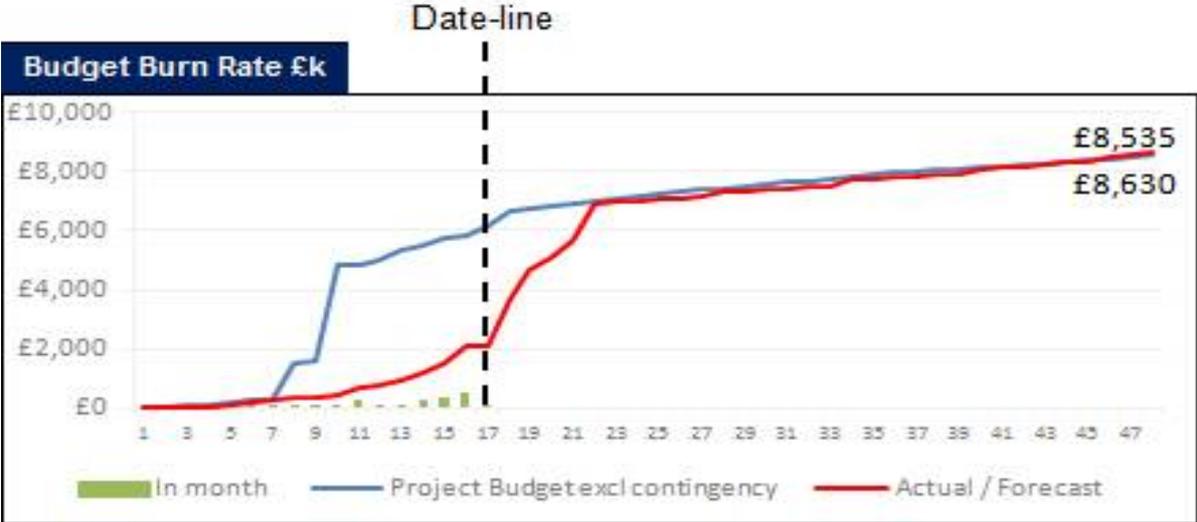
*Table 8.1 – Project expenditure*

£'000s Excluding Partner Funding Ofgem Cost Category	Spend to date			Total Project		
	Actual	Budget	Variance	Forecast	Budget	Variance
<b>Summary</b>						
Labour	641	928	287	1,932	1,888	(44)
Equipment	567	2,915	2,348	3,346	3,235	(111)
Contractors	573	1,126	552	1,908	1,960	52
IT	257	1,090	833	1,090	1,090	(0)
Contingency	(0)	512	512	(0)	1,015	1,016
Decommissioning	0	0	0	39	39	0
Other	67	78	10	315	323	8
<b>Total Costs</b>	<b>2,106</b>	<b>6,648</b>	<b>4,542</b>	<b>8,630</b>	<b>9,550</b>	<b>920</b>

Note 1: Project Budget as defined in Project Direction - December 2013

The actual spend to date is £2106k and the estimate at completion cost is now £8630k.

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 £4030k variance spend to date excluding contingency to the original Project budget. It is forecast that spend will closely align with the Project budget by the end of the third quarter 2015 when the construction phase is completed. This has not jeopardised the delivery of any SDRC's as the costs were associated with relatively long duration activities. The Project Manager is already seeing evidence this happening with over £1,300k of equipment being invoiced and goods received in the first half of June 2015.



The estimated at completion forecast is currently expected to remain in line with the original budget of £8,630k excluding contingency. (There are currently no known issues that will require utilisation of contingency held within this budget.) 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 May 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 narrative has also been peer-reviewed by the Electricity North West future networks manager and the Electricity North West networks strategy and technical support director.

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 networks strategy and technical support director.

## APPENDIX A – PROJECT DIRECTION PROJECT BUDGET

£000's	
Excluding Partner Funding	
Ofgem Cost Category	
<b>Labour</b>	<b>1,888</b>
HV & LV Network Management & Interconnection - Labour	305
Network Configuration & Voltage Optimisation - Labour	431
Project Management, Planning, Policy and Training - Labour	1,152
<b>Equipment</b>	<b>3,235</b>
Data Preparation - Equipment	285
HV & LV Network Management & Interconnection - Equipment	2,229
HV & LV Voltage Control - Equipment	721
<b>Contractors</b>	<b>1,960</b>
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
<b>IT</b>	<b>1,090</b>
Network Configuration & Voltage Optimisation - IT	1,090
<b>Contingency</b>	<b>1,015</b>
HV & LV Network Management & Interconnection - Contingency	272
HV Voltage Control - Contingency	426
Dissemination, Policy, Training & Trials - Contingency	82
Network Configuration & Voltage Optimisation - Contingency	235
<b>Decommissioning</b>	<b>39</b>
Decommissioning	39
<b>Other</b>	<b>323</b>
Technology build and Trials data - Other	87
Learning & Dissemination - Other	133
Accommodation - Other	103
<b>Total</b>	<b>9,550</b>

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			Variance %	Comments
	Actual	Plan	Variance	Forecast	Plan	Variance		
<b>Labour</b>	<b>641</b>	<b>928</b>	<b>287</b>	<b>1932</b>	<b>1,888</b>	<b>(44)</b>	<b>-2%</b>	
HV & LV Network Management & Interconnection - Labour	31	154	122	317	305	(12)	-4%	
Network Configuration & Voltage Optimisation - Labour	231	349	118	453	431	(22)	-5%	
Project Management, Planning, Policy and Training - Labour	379	426	47	1,161	1,152	(9)	-1%	
<b>Equipment</b>	<b>567</b>	<b>2,915</b>	<b>2,348</b>	<b>3,346</b>	<b>3,235</b>	<b>(111)</b>	<b>-3%</b>	
Data Preparation - Equipment	0	0	0	285	285	0	0%	
HV & LV Network Management & Interconnection - Equipment	185	2,194	2,009	2,336	2,229	(106)	-5%	
HV & LV Voltage Control - Equipment	382	721	338	725	721	(4)	-1%	
<b>Contractors</b>	<b>573</b>	<b>1,126</b>	<b>552</b>	<b>1,908</b>	<b>1,960</b>	<b>52</b>	<b>3%</b>	
Customer Engagement & Survey - Contractors	59	59	0	91	110	19	18%	
HV & LV Voltage Control - Contractors	218	271	54	321	350	29	8%	
LV Network Management & Interconnection - Contractors	91	71	-20	162	161	(2)	-1%	
Network Configuration & Voltage Optimisation - Contractors	183	368	184	421	381	(41)	-11%	
Peer reviews, support & customer research - Contractors	22	46	24	142	142	0	0%	
Research -Technical - Contractors	0	209	209	603	626	23	4%	variance due to finalisation of contract with UOM
Research - CBA & CIA - Contractors	0	102	102	167	189	23	12%	variance due to finalisation of contract with UOM
<b>IT</b>	<b>257</b>	<b>1,090</b>	<b>833</b>	<b>1090</b>	<b>1,090</b>	<b>0</b>	<b>0%</b>	
Network Configuration & Voltage Optimisation - IT	257	1,090	833	1090	1,090	0	0%	
<b>Contingency</b>	<b>0</b>	<b>512</b>	<b>512</b>	<b>0</b>	<b>1,015</b>	<b>1,016</b>	<b>100%</b>	
HV & LV Network Management & Interconnection - Contingency	0	233	233	0	272	273	100%	Not anticipating use of contingency at this stage
HV Voltage Control - Contingency	0	124	124	0	426	426	100%	Not anticipating use of contingency at this stage
Dissemination, Policy, Training & Trials - Contingency	0	0	0	0	82	82	100%	Not anticipating use of contingency at this stage
Network Configuration & Voltage Optimisation - Contingency	0	155	155	0	235	235	100%	Not anticipating use of contingency at this stage
<b>Decommissioning</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>39</b>	<b>39</b>	<b>0</b>	<b>0%</b>	
Decommissioning	0	0	0	39	39	0	0%	
<b>Other</b>	<b>67</b>	<b>78</b>	<b>10</b>	<b>315</b>	<b>323</b>	<b>8</b>	<b>2%</b>	
Technology build and Trials data - Other	0	1	1	87	87	1	1%	
Learning & Dissemination - Other	54	42	-12	126	133	7	6%	
Accommodation - Other	14	35	21	103	103	0	0%	
<b>Total</b>	<b>2,106</b>	<b>6,648</b>	<b>4,542</b>	<b>8,630</b>	<b>9,550</b>	<b>920</b>	<b>10%</b>	Difference due to not anticipating use of contingency.

## APPENDIX C – PROJECT BANK ACCOUNT

The bank statement below details all transactions relevant to the Project up to 31 May 2015. This includes all receipts and payments associated with the Project up to the May 2015 month end reporting period.

Lloyds Bank		Yesterday's Statement			C082421	
Statements and Balances						
300002-01676933						
ELECTRICITY NWL NO.13 LCNF (SMART) (GBP)						
Date	Type	Narrative	Value Date	Payments	Receipts	Balance
01DEC14		Opening Ledger Balance				6,230,323.23 Cr
09DEC14	CR	INTEREST (GROSS)			2,242.34	6,232,664.57 Cr
16DEC14	BGC	UK.PN OPERATIONS BGC 1000 20000169645 K			54,226.33	6,286,890.90 Cr
16DEC14	BGC	UK.PN OPERATIONS BGC 1000 20000169644 K			85,967.38	6,372,858.28 Cr
16DEC14	DR	SERVICE CHARGES REF : 157526687		0.60		6,372,857.68 Cr
19DEC14	BGC	R.B 5-SP MANWEB BGC LOW CARB NWRK2014/			35,804.37	6,408,662.05 Cr
19DEC14	BGC	R.B 5-SP DISTRIBUT BGC LOW CARB NWRK2014/			47,939.08	6,456,601.13 Cr
24DEC14	BGC	NORTHERN ELECTRIC BGC LCNF			38,031.66	6,494,632.79 Cr
24DEC14	BGC	NORTHERN ELECTRIC BGC LCNF			54,572.59	6,549,205.38 Cr
24DEC14	CR	FROM A/C TFR 02749020 300002			166,958.26	6,716,163.64 Cr
29DEC14	FFLOW	F/FLOW SOUTHERN EL TFR			15,363.80	6,731,527.44 Cr
29DEC14	FFLOW	F/FLOW SCOTTISH HY TFR			18,022.37	6,749,549.81 Cr
29DEC14	FFLOW	F/FLOW WESTERN POW TFR WPD GROUP 2014/15 LCNF PROJE			186,323.17	6,935,872.98 Cr
31DEC14	CR	CREDIT INTEREST			9,189.37	6,945,062.35 Cr
09JAN15	CR	INTEREST (GROSS)			2,817.82	6,947,880.17 Cr
19JAN15	DR	SERVICE CHARGES REF : 159818652		0.60		6,947,879.57 Cr
26JAN15	FFLOW	F/FLOW WESTERN POW TFR WPD GROUP 2014/15 LCNF PROJE			186,323.17	7,134,202.74 Cr
27JAN15	BGC	UK.PN OPERATIONS BGC 1000 2000007546 K			54,226.33	7,188,429.07 Cr
27JAN15	BGC	UK.PN OPERATIONS BGC 1000 2000007545 K			85,967.38	7,274,396.45 Cr
28JAN15	BGC	R.B 5-SP MANWEB BGC LOW CARB NWRK2014/			35,804.37	7,310,200.82 Cr
28JAN15	BGC	NORTHERN ELECTRIC BGC LCNF			38,031.66	7,348,232.48 Cr
28JAN15	BGC	R.B 5-SP DISTRIBUT BGC LOW CARB NWRK2014/			47,939.08	7,396,171.56 Cr
28JAN15	BGC	NORTHERN ELECTRIC BGC LCNF			54,572.59	7,450,744.15 Cr
28JAN15	FFLOW	F/FLOW SOUTHERN EL TFR			15,363.80	7,466,107.95 Cr
28JAN15	FFLOW	F/FLOW SCOTTISH HY TFR			18,022.37	7,484,130.32 Cr
29JAN15	CR	FROM A/C TFR 02749020 300002			166,958.26	7,651,088.58 Cr
09FEB15	CR	INTEREST (GROSS)			3,080.44	7,654,169.02 Cr
17FEB15	BGC	UK.PN OPERATIONS BGC 1000 2000013289 K			54,226.33	7,708,395.35 Cr
17FEB15	BGC	UK.PN OPERATIONS BGC 1000 2000013288 K			85,967.38	7,794,362.73 Cr
23FEB15	DR	SERVICE CHARGES REF : 162060987		1.20		7,794,361.53 Cr
26FEB15	FFLOW	F/FLOW WESTERN POW TFR WPD GROUP 2014/15 LCNF PROJE			186,323.17	7,980,684.70 Cr
26FEB15	FFLOW	F/FLOW SOUTHERN EL TFR			15,363.80	7,996,048.50 Cr
26FEB15	FFLOW	F/FLOW SCOTTISH HY TFR			18,022.37	8,014,070.87 Cr
27FEB15	BGC	NORTHERN ELECTRIC BGC LCNF			38,031.66	8,052,102.53 Cr
27FEB15	BGC	NORTHERN ELECTRIC BGC LCNF			54,572.59	8,106,675.12 Cr
27FEB15	CR	FROM A/C TFR 02749020 300002			166,958.26	8,273,633.38 Cr
02MAR15	BGC	R.B 5-SP MANWEB BGC LOW CARB NWRK2014/			35,804.37	8,309,437.75 Cr
02MAR15	BGC	R.B 5-SP DISTRIBUT BGC LOW CARB NWRK2014/			47,939.08	8,357,376.83 Cr
09MAR15	CR	INTEREST (GROSS)			3,060.58	8,360,437.41 Cr
10MAR15	BGC	UK.PN OPERATIONS BGC 1000 2000018846 K			54,226.33	8,414,663.74 Cr
10MAR15	BGC	UK.PN OPERATIONS BGC 1000 2000018845 K			85,967.38	8,500,631.12 Cr
17MAR15	DR	SERVICE CHARGES REF : 164293548		0.60		8,500,630.52 Cr
20MAR15	DR	TO A/C TFR 02749020 300002		52,506.14		8,448,124.38 Cr
20MAR15	DR	TO A/C TFR 02749020 300002		262,609.24		8,185,515.14 Cr
Version : 3,16,1,515						
This report is confidential and for the intended recipient only.				08/06/15 16:04:49		
If you are not the intended recipient please destroy this page immediately.				Page 1		



300002-01676933  
ELECTRICITY NWL NO.13 LCNF (SMART) (GBP)

Date	Type	Narrative	Value Date	Payments	Receipts	Balance
23MAR15	DR	TO A/C TFR 02749020 300002		90,607.27		8,094,907.87 Cr
23MAR15	DR	TO A/C TFR 02749020 300002		125,877.47		7,969,030.40 Cr
24MAR15	DR	TO A/C TFR 02749020 300002		232,333.22		7,736,697.18 Cr
26MAR15	F/FLOW	F/FLOW WESTERN POW TFR WPD GROUP			186,323.17	7,923,020.35 Cr
27MAR15	BGC	2014/15 LCNF PROJE R.B S-SP MANWEB BGC			35,804.37	7,958,824.72 Cr
27MAR15	BGC	LOW CARB NWREK2014/ NORTHERN ELECTRIC BGC			38,031.66	7,996,856.38 Cr
27MAR15	BGC	LCNF R.B S-SP DISTRIBUT BGC			47,939.08	8,044,795.46 Cr
27MAR15	BGC	LOW CARB NWREK2014/ NORTHERN ELECTRIC BGC			54,572.59	8,099,368.05 Cr
27MAR15	CR	LCNF FROM A/C TFR			166,958.26	8,266,326.31 Cr
27MAR15	F/FLOW	02749020 300002 F/FLOW SCOTTISH HY TFR			18,022.37	8,284,348.68 Cr
27MAR15	F/FLOW	F/FLOW SOUTHERN EL TFR			15,363.80	8,299,712.48 Cr
09APR15	CR	INTEREST (GROSS)			3,522.25	8,303,234.73 Cr
17APR15	DR	SERVICE CHARGES REF : 166537692		0.50		8,303,234.23 Cr
11MAY15	CR	INTEREST (GROSS)			3,639.77	8,306,874.00 Cr
18MAY15	DR	SERVICE CHARGES REF : 169543980		0.60		8,306,873.40 Cr
01JUN15		Value of Credits (47)			2,840,488.61	
01JUN15		Value of Debits (11)		763,937.44		
01JUN15		Closing Ledger Balance				8,306,873.40 Cr
01JUN15		Closing Cleared Balance				8,306,873.40 Cr

\*\*\* End of Report \*\*\*