



Low Carbon London  
'a learning journey'

Project Progress Report  
15 June 2012

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## 1. Executive Summary

Low Carbon London has made significant progress during the last 6 months with several key objectives and milestones achieved, delivering to the plans, objectives and deliverables as set out in the project direction and underpinned by the LCNF bid submission. A set of Successful Delivery Reward Criteria (SDRC) was delivered on schedule at the end of September, most notably the commissioning of the Low Carbon London Learning Lab at Imperial College.

The following SDRCs have been completed in the period or are due to be completed in the period:

- First stage of solution implementation complete by the end of June 2012.
- Testing of release of the Operational Data Store (ODS) completed in May 2012.
- Smart Meter Installation underway – c. 4,000 smart meters installed to date, with access to data from a further 500 smart meters.
- I&C Demand Response trials – winter 2011/2012 demand response complete (three trials completed), and summer I&C demand response trials commenced by end of June, one trial completed to date.
- Multipartite demand side management contracts – two demand aggregation contracts have been developed, completed, and are now in active use. It is not considered feasible and following extensive dialogue with National Grid, to produce a demand response contract involving National Grid in the timescales of the project. The necessary learning and experience to develop such a service and contract continues to be explored and developed.
- CO2 impact assessment report is scheduled to be complete by the end of June 2012.

The Low Carbon London (LCL) project successfully completed the pilot exercise to deploy over 500 smart meters into residential homes in London as well as its winter 2011/12 trial of industrial and commercial (I&C) demand response. The project currently has c.13MW signed up on the I&C demand response trials, and customer participation recruitment continues. The summer 2012 demand response trial has commenced and demand response calls have been activated.

Two well-received learning dissemination events supporting these accomplishments have also been held: in February the project held an event to present the learning and findings from the initial smart meter deployment and in May held a further event to both present the findings from the winter 2011/12 demand response trial and outline the rest of the project's activities in the industrial and commercial demand response sector. The project remains committed to sharing the learning outcomes and findings to our customers, interested stakeholders and the wider DNO community through various dissemination events and workshops.

The project has, at the time of writing, installed over 4,000 residential smart meters in London with appointments made with for a further 3,000 installations, providing the foundation for the forthcoming smart metering and time of use tariff (ToU) trials. The project is forecast to reach its objective of installing over 6,500 meters before the end of 2012 in addition to the meter installations in the three engineering instrumentation zones. The latter is subject to a suitable production version SMETS-1 compliant smart meter being available. The project intends to commence its ground-breaking dynamic ToU tariff trials by January 2013. The multi-tiered pricing schedule for these tariff trials has now been agreed with the project's energy supply partner EDF Energy.

The project has so far recruited 24 private electric vehicle (EV) owners onto the project's trials and has commenced installing secondary smart meters and charging posts where appropriate. Recruitment continues across a number of fronts. Commercial EV's are being recruited through a number of channels with 60 vehicles currently registered, either directly through enrolment of

organisations actively using EV's in London or through the Charging Network Operator (CNO) organisation. The project works closely with Transport for London (TfL) and the London Electric Vehicle Partnership (LEVP) to promote participation in the project's EV trials, with access currently to 650 EV charge posts via the Source London PiP scheme. Many more EV's will be monitored through public EV charging posts located in London, most notable is our collaboration with EDF Energy, which includes EV's and charge posts being used as part of London's 2012 Olympic Games official transportation service.

Significant effort has been expended in trial participant recruitment – far in excess of that envisaged in the original bid or the early stages of the project. This investment has been made in recognition of and to address some of the challenges presented by the prevailing economic downturn and the reluctance of potential participants to commit to participation in the various project trials. The efforts have included engaging a specialist market research company to undertake a detailed investigation and analysis of the I&C market with regard to its appetite for demand response and automated network management of distributed generation facilities. Furthermore, the project has invested considerable time and effort in attendance at numerous trade fairs, exhibitions, conferences and meetings with trade associations, user groups, equipment manufacturers, buildings management companies, designers, consultants and planners.

The project has also developed a range of incentives to attract both residential and I&C participants to take part in the project.

Low Carbon London has developed and maintains a rich dialogue with both the Mayor's Office, the Greater London Authority (GLA) and in particular, the project managers working in the Mayor's 10 Low Carbon Zone initiatives. These relationships have successfully built upon various initiatives that promote efficient low carbon energy use and developing a recruitment channel to participant in the project's trials.

In March 2012, the first edition of a regular quarterly newsletter was distributed electronically across the UK and internationally and has been positively received. This provides links into the project's web site ([www.lowcarbonlondon.info](http://www.lowcarbonlondon.info)) providing further information about the project and invites participation across the various trials.

Low Carbon London continues to attract interest from around the world and regularly hosts international visitors from other low carbon initiatives who are interested in how London is proposing to move to a sustainable low carbon economy. Learning and dissemination questionnaires have been issued through the International Utilities Working Group (IUWG) and responses received enable us to build on experiences and to incorporate insights from projects around the world.

External factors and prevailing economic conditions continue to present real and interesting challenges to the project particularly in the area of recruiting sufficient numbers of participants to partake in the various trials. The continued unavailability of a suitable SMETS-1 compliant ("Gen 3") smart meter has meant that the project has deployed the existing "Gen 2" meters for its planned tariff trials and has delayed the commencement of its trials in the three designated engineering instrumentation zones. The unavailability of "Gen 3" meters has also delayed the start of trials involving heat pumps (HPs), small scale embedded generation (SSEG) and photo-voltaic (PV) installations. These trials all require a "Gen 3" smart meter that is able to measure voltage and power quality. Alternatives to collecting consumption readings with voltage measurement continue to be considered.

A regular monthly dialogue has been established with Ofgem through a written progress report to facilitate regular updates in the particularly challenging areas of trial participant recruitment. This has recently been reinforced with an in-depth review meeting with Ofgem to determine the possible options available to the project in the remaining time and the best way ahead to

optimise efforts and results. These discussions are continuing and will result in a formal Low Carbon Network Fund (LCNF) project change request being submitted to Ofgem in July 2012, following detailed cost-benefit analysis of the options and a recommended way forward.

Specific discussions are also underway with another LCNF project, Customer-Led Network Revolution, led by Northern Power Grid. Our proposal is to share information and early learning between the two projects to augment that data gathered directly from the respective projects' trials. This will support the production of learning reports.

The project will use the rest of 2012 to continue its efforts to recruit trial participants and to shape the remainder of the trials. There will be a review with Ofgem in December 2012 to agree the statistical basis of the trials going forward. We have developed the facility to use virtual network and customer trial topologies within the IT and data architectures. This will support the trial experiments using relevant data sourced from outside the London Power Network (LPN) to ensure robust trial outcomes.

Trials based on monitoring the impact of heat pumps, EV's, SSEG and distributed energy will commence on a rolling basis once participants are recruited and suitable metering equipment installed. The project will also run further demand response trials in the following periods – summer 2012, winter 2012/13 and spring/summer 2013.

Learning and successful trial experiment outcomes remain pivotal to the original objectives of the project. Low Carbon London is represented on various working groups of the DECC/Ofgem Smart Grid Forum and continues to input views, strategy and concepts to those groups as well as other industry and knowledge forums.

The project is investigating visualisation for the learning laboratory as well as the development of a project/company/DNO community on-line 'white board' for learning sharing and dissemination. Meetings have been held with Google, IBM, GE, Siemens and Logica regarding visualisation and planning tools for the future.

To ensure timely active dissemination of learning and experience, Low Carbon London is aligned with other innovative low carbon smart grid trials, these include;

- the GLA's EU-funded 'Project Celsius', looking at the successful development and deployment of heat networks and their interaction with electricity grids as well as the use of active network management and demand response for the connection of CHP plant
- a number of Technology Strategy Board (TSB) funded bids led by other organisations – e.g. trials for residential demand response and active network management.

We will continue to share learning and experience throughout the lifetime of the project to support the drive towards a Low Carbon London – a learning journey to help meet ambitious targets to deliver the transition to a low carbon economy across the whole of Great Britain and beyond.

## 2. Project manager's report

### 2.1 Progress made this period

In this reporting period the project has focused on several key objectives:

- delivering the SDRC due this period;
- recruitment of trial participants – for both residential and I&C trials – this has been the main focus of the project during this reporting period and has been a major but very valuable undertaking;
- accelerating the smart meter rollout for the smart meter and ToU tariff trials;
- developing time of use tariff design, customer acquisition & journey materials, treatment schedule and price point analysis;
- completing the detailed design of the various trials;
- establishing of the Trials Operations Team;
- undertaking the winter 2011 demand response trial;
- developing and commencing the summer 2012 I&C demand response trial using learning and insight gained from the winter 2011/12 trial;
- holding two major learning dissemination events, one in February 2012 on the results of the findings from the recruitment of the initial 500 smart meter trial participant's and the second in May on the learning from the winter demand response trial, as well as various UK Power Network internal learning dissemination events;
- developing a carbon impact report based on the winter 2011 demand response trial; and
- mitigation of external and internal risks.

### 2.2 Successful Delivery Reward Criteria Milestones

LCL will meet its SDRC milestone to deliver the initial CO2 impact assessment report by the end of June 2012. The project has also met the SDRC to complete the first stage of solution implementation with testing of release 1 of the Operational Data Store (ODS) which was completed in May 2012. The project has also implement demand aggregation contracts, and staged three demand aggregation calls. Smart meter installation is well underway with a total of c. 4500 meters installed in the period.

Other SDRC milestones due this period have been impacted by external events as detailed in the interim monthly reports. These are still achievable in the overall timeline of the project and will be re-scheduled as part of the change request to be submitted by end of July 2012 as discussed in more detail in the table below and section 7.

Table 1: SDRC Status

Build Phase SDRC's	Status
Preparation of solution implementation complete: Logica smart metering Head End solution and Learning Laboratory commissioned (Appendix 2, Use Case U07.1 and U07.2).	Completed.
Preparation for c.5,000 smart meter roll out complete, including address selection, acceptance surveys, privacy and security measures	Completed by Q4 2011, development and in continued roll-out during the period. Rollout continues to progress c.6,500 smart meters to be installed by December 2012 by EDF Energy and c.1,000 smart meters by British Gas (access to existing smart meter data or new installs) including within the engineering instrumentation zones – Queens Park, Brixton and Wandle Valley.
First stage of solution implementation complete: Operational Data Store and interface to Logica head end commissioned, smart meter installation underway and “carbon impact tools” delivered.	Completed.
Implementation of initial trials based on data from the initial smart meters and half hourly industrial & commercial (I&C) customer meters with analysed results	<p>CO2 impact assessment report by the end of June 2012 – will be completed.</p> <p>Initial I&amp;C DR trials completed – winter trial results documented, and summer trials commenced.</p> <p>Multipartite demand aggregation contract (two parties) completed and in use; a further development of the initial contract form has been developed and is in use with one of the aggregators with proposals to implement with other aggregators. A national level form of aggregation contract involving National Grid is not considered feasible in the time scales of the project, although discussion has commenced on a tri-partite arrangement between UK Power Networks, another DNO, aggregator and customer.</p> <p>Two I&amp;C Demand Response learning events completed with initial views documented on conflicts and synergies.</p>

Trials Phase SDRC's	Status
<p>Conclusion of “Using Smart Meters and Substation Sensors to Facilitate Smart Grids” trials – complete Q2 2012.</p> <p>Understanding customer behaviour and potential network impact (Appendix 2, Use Case U04.1)</p> <p>Use of Smart Meter information to support distribution network planning and design (Appendix 2, Use Case U04.2)</p> <p>Use of smart meter data to support network operations (Appendix 2, Use Case U04.3)</p>	<p>These SDRC's should have been timed for Q2 2013 completion originally, and are now planned to be completed by Q4 2013; with an anticipation of final results and reports being available by Q3 2014.</p>
<p>Conclusion of “Enabling and Integrating Distributed Generation” trials – complete Q2 2013</p> <p>Facilitating connections to LV and HV distribution networks (Appendix 2, Use Case U02.1)</p> <p>Active Management of DG to address security of supply concerns and postpone network reinforcement (Appendix 2, Use Case U02.2)</p>	<p>Timely completion of this SDRC will depend on successful recruitment of DG owners to participate in trials. Progress has been made in identifying and signing up participants, although this has been slow. SDRC is forecast for completion by Q4 2013, and as there is value to running the trials for as long as possible; with an anticipation of final results and reports being available by Q2 2014.</p>
<p>Conclusion of “Enabling Electrification of Heat and Transport” trials – complete Q4 2013</p> <p>Exploring impact of electric vehicle charging (Appendix 2, Use Case U03.1)</p> <p>Exploring the impact of heat pump demand (Appendix 2, Use Case U03.2)</p>	<p>At this stage we anticipate no delays in completing this SDRC. However, this is dependent on a supplier offering Time of Use (ToU) tariffs; a SMETS compliment meter being available; and the successful recruitment of trial participants. Currently amongst other leads in development we have 25 residual EV trial participants and c. 60 commercial EV's signed up, access to c.675 EV charge posts, with further progress with other third parties. Sufficient HP and PV participants have been identified and recruitment campaigns designed and commenced – commencement is dependant on a suitable smart metering device; with an anticipation of final results and reports being available by Q2 2014.</p>



Trials Phase SDRC's	Status
Conclusion of “Residential and SME Demand Side Management” trials – complete Q3 2013 Energy Efficiency programmes and technologies (Appendix 2, Use Case U05.1.a) Consumer Behaviour demand response and responsiveness to TOU tariffs” trials (Appendix 2, Use Case U05.1.b)	Proposed to be completed by Q4 2013. Timely completion of this SDRC will depend on no further delays to the DECC smart meter specifications, the availability of a SMETS compliant meter; and successful participant recruitment. In addition, this SDRC is dependent on a supplier offering ToU tariffs. EDF Energy, our current supplier partner, along with ICL have completed detailed works and development of a dynamic and dynamic wind set of trial experiments and tariff and invention structure, planned to be completed by 30 June 2012; with an anticipation of final results and reports being available by Q4 2014.
Conclusion of “I&C Demand Side Management” trials – complete Q1 2014 Demand side management with I&C customers (Appendix 2, Use Case U05.2) Demand side management conflicts and synergies (Appendix 2, Use Case U05.3)	At this stage we anticipate no delays in completing this SDRC. 13MW of I&C responsive demand is currently under contract, with recruitment activity continuing. There are challenges around building turndown demand which we seeking to address in relation to recruitment of suitable customers; with an anticipation of final results and reports being available by Q3 2014.
Conclusion of “Wind Twinning” trials – complete Q1 2014 Wind twinning through TOU tariffs with Suppliers (Appendix 2, Use Case U01.1) Wind twinning through responsive demand contracts with Commercial Aggregators (Appendix 2, Use Case U01.2)	At this stage we anticipate no delays in completing this SDRC, with an anticipation of final results and reports being available by Q3 2014.
Conclusion of trials Q2 2014 for: “New Network Design and Operational Practices” (Appendix 2, Use Case U08) “Network Planning and Operational Tools” (Appendix 2, Use Case U06)	At this stage we anticipate no delays in completing this SDRC, with an anticipation of final results and reports being available by Q4 2014.

### 2.3 Trial participant recruitment

The project has invested significant effort, resources and time in the recruitment of trial participants. The recruitment of participants across the entire project’s trials has presented challenges far in excess of those envisaged during the bid preparation and the initial stages of the project itself. These challenges are a result of a number of external factors.

The prevailing economic conditions, for example, have impacted the availability and consequent up-take of electric vehicles into the trials, which have been significantly lower than previously forecast. Legislative delays to the renewable heat incentive and green deal have detrimentally impacted the uptake of heat pumps whilst uncertainty around the feed-in tariffs for PV has similarly lowered the base PV installations from which trial participants can be recruited.

The delay in the availability of a SMETS-1 compliant smart meter (estimated at over a year’s delay from availability dates assumed in the original bid) has delayed the recruitment of smart

meter trial participants, although this has been mitigated to a certain extent by the use of an alternative smart meter, the involvement of British Gas as an additional supplier and the creation of the engineering & instrumentation trial zones. The project has deployed existing “Gen 2” meters to be used in the residential tariff trials, but has had to delay the initiation of the residential engineering and instrumentation zone trials, as well as the heat pump trials, both of which require a SMETS-1 compliant production version smart meter capable of measuring voltage.

Currently, there is no SMETS-1 smart meter available on a production basis and the continued risk this presents to the project will be evaluated in the change request that will be submitted in July to Ofgem and in the subsequent December 2012 review.

These factors have all combined to present significant challenges in the recruitment of residential trial participants, although some very interesting learning has been developed and experienced. This will be used to good effect in ongoing recruitment and development of customer and stakeholder engagement and which is of interest for the planned national roll-out of smart meters.

The recruitment of I&C trial participants has been detrimentally impacted by the absence of incentives to participate in the distributed energy active network management (ANM) trials and unwillingness of customers to allow active control of the output of their CHP units.

The project has put in place a number of mitigations to attract trial participants to the ANM trials, an example of which is having a monitoring-only option for CHP plant, before potentially moving to full active network management and control.

The project also commissioned an investigative exercise from a specialist market research company to identify other issues impacting I&C recruitment. The findings of this work reported a wide range of factors including the breadth of different potential customers e.g. from facilities management companies, buildings architects, CHP design organisations through to sustainability managers. Potential recruits require focused and targeted proposals, with differing perceived benefits from the customer’s perspective. The complexity of the initial market offering was also identified as an issue as well as a frequently voiced requirement for transparent uncomplicated financial benefits to the customer.

Competition with National Grid STOR contracts for available generation capacity in the demand response trials has been recognised as a point of conflict impacting participant recruitment. To assist with further demand response participants, the project has also sought trial recruits from additional demand aggregators for I&C demand response trials.

The fact that the opportunity to participate in the project’s trial is a non-core activity for the potential participant requires the project to instigate significant follow-up activity to ensure that the potential participant does not lose interest during the recruitment phase and subsequently decides not to participate. This is considered truly reflective of an enduring provision to procure such services using this method of deployment of I&C demand response and ANM response.

An important finding particularly in the distributed energy automated network management trials was that the potential customers had difficulty in understanding what the proposal was – this reflected the complexity of the offering and was a significant factor in shaping the reluctance of I&C representatives to participate in the trials. These findings have been taken on board and the project is targeting a concentrated I&C recruitment phase during Q2 and Q3 2012, with additional resources being engaged to provide a “task-force” approach to I&C recruitment. This initiative is coupled with a decision to decompose the distributed energy proposition into a number of discrete simpler proposals that can be taken to the market-place.

A key learning point emanating from the project to date is the fact that trial participant recruitment was not fully recognised in the bid evaluation process as the key risk to the project, and consequently the resources in time, money and people that the project has had to direct at recruiting trial participants has been far in excess of that previously envisaged.

The project has also developed a useful overview brochure (Appendix 1) which is used to introduce the project to prospective trial participants.

### **2.3.1 Smart meter participant recruitment**

The project has been actively recruiting residential customers from both EDF Energy and British Gas to participate in the smart meter trials. At this stage it is still intended to run separate dynamic and static time of use tariff trials, both underpinned by a control group who just have a smart meter and IHD. The statistical validity and confidence levels associated with the findings will be wholly dependent upon final numbers recruited and then as importantly, the number of people from that pool that subsequently agree to participate in a tariff trial (static or dynamic ToU).

The project has assumed a 30% take-up rate of smart meter trial participants subsequently agreeing to partake in the dynamic ToU tariff trials. This is recognised by the project as on the high side of typical take-up rates for any recruitment campaign. The actual tariff take-up rates are not expected to be known until November-December 2012 after the ToU recruitment process has been completed, however, the current intention is to prioritise the dynamic ToU trials. This will as much as possible preserve the statistical validity and confidence levels of those findings, given that the Low Carbon London dynamic ToU trials are unique to the project and these trials are the first of this kind to be carried out in Great Britain.

The project is also keen to recruit a representative cross-section of Londoner demographic profiles onto the tariff trials, and to achieve this, the ongoing accumulated demographic profile of those participants recruited to date has been carefully assessed, and continues to be carefully monitored and evaluated against a defined demographic profile based on 17 Acorn demographic groupings. Targeted marketing is now being deployed to ensure the intended profile is achieved across these 17 groupings.

The exact nature of the trials to commence in January 2013 will be finalised as part of the project change request to be submitted in July 2012, which will include a review in early Q4 2012 with Ofgem, once the actual dynamic tariff trial up-take rates and final smart meter numbers are known.

The project has currently recruited over 4,000 EDF Energy and 500 British Gas residential customers onto the project's smart meter trials.

We have developed three specific zone areas in Queens Park, Brixton and Wandle Valley known as the engineering instrumentation zones to specifically trial DNO effects of smart meter roll-out as well as the static and demand time of use trials for DNO network impact analysis. In addition, the establishment of virtual network and virtual customer profiles allows us to use real network and consumption data to execute the various trial experiments that have been developed – some 100 in total – assessing the various and detailed effects of low carbon technologies to be deployed in the transition to a low carbon future; and to model behaviour response scenarios.

#### **2.3.1.1 Smart meter participant incentives**

In order to attract as many smart meter participants to agree to participate in tariff trials it is intended to offer some financial incentives to potential participants to both agreeing to

participate and then subsequently remaining on the trials until they are completed – the exact sums will be agreed in Q3 2012 prior to tariff recruitment commencing, and which needs to remain confidential until then so as to not affect a successful trial outcome.

### 2.3.2 Electric vehicle trial participant recruitment

The project has worked extensively across a number of fronts to engage with as many EV owners in London, e.g. organisations using EVs, EV manufacturers, the G-Wiz owners club, Transport for London (TfL), Source London (including the Mayor's Electric 20 and the London Electric Vehicle Partnership (LEVP)). Between the Electric 20 and LEVP there are over 480 organisations using EV's in London.

A major recruitment campaign was undertaken during this reporting period in conjunction with TfL, to contact owners of vehicles who had registered for exemption from London's congestion charge scheme. Of the c.1,300 who had registered for exemption, 463 had given permission to be contacted by third parties, such as Low Carbon London; contacting these 463 owners has generated 63 individual leads who qualify to take part in the residential EV trials. Of these, around 24 are expected to participate in the trials and have a smart meter installed to monitor charging behaviour at home.

UK Power Networks has trialled several EVs and is in the process of leasing three EVs for use in the operational business which will be monitored through charging posts installed at key UK Power Networks' operational sites and offices.

TfL has agreed to include seven commercial EVs in the trials. The project is also planning to work with TfL to monitor an inductive loop pilot with a London Bus, and to potentially get involved in a proposed induction loop vehicle charging trial – both later in 2012.

UPS have agreed to include 20 EVs and EV charge-points used enabling EV-based deliveries around London in the project's trials. Tube Lines Ltd, who maintain some of London's underground train network, have also committed to participate in the EV trials, with 19 EVs and 10 EV charge-points.

Working with EDF Energy, the project is working to gain access to the charging data of 100 Smart Mercedes vehicles. EDF Energy, has also agreed to the use of charging data from network charging infrastructure and posts for 200 EV's to be used during the 2012 Olympic Games. Other third party operators and owners are also in the process of being recruited and discussions are ongoing with these entities.

Discussions are ongoing with a number of EV and equipment manufacturers (e.g. PodPoint, Nissan, Renault) which are expected to identify more EV owners who can be offered the opportunity to participate in the project's trials.

Appendix 2 illustrates the specific EV marketing brochure that the project uses to market to prospective trial participants.

The trial experiments will also be supplemented with case study and other data sources to provide robust trial outputs and reports.

### 2.3.2.1 EV participant incentives

Working with the TfL Source London Plugged in Places scheme and as an incentive to participate in the EV trials, a free domestic charging post (worth c. £1000) has been offered to the first 100 suitable (Mode 3 charging, with a specific multi-pin socket) home based EV owners and the first 50 commercial work place users to apply to participate. These charging points have been part financed via funding secured through OLEV, Source London and Plugged in Places – the first such scheme in the country. To date, six participants have qualified for the free charging point.

### 2.3.3 Heat pump trial participant recruitment

The project has several channels to recruiting heat pump owners and operators onto the project's trials:

- a) Contacts made through the Greater London Authority (GLA) and the Institute for Sustainability (IfS). Both bodies have knowledge of London Boroughs who have/may have installed heat pumps in their housing stock. The project is working with the established contacts in the London Boroughs to identify these potential participants.
- b) Through heat pump installers operating within London including Geothermal International, who have between 50 and 80 suitable heat pumps units installed in London.
- c) In addition, discussions are underway with ISO Energy and Mitsubishi Electric who have around 49 heat pump installations in the London Power Network (LPN) area with over a further 100 installations in the Eastern and Southern Power Networks (EPN and SPN) within the overall UK Power Networks footprint.
- d) The above potential participants will be supplemented with approximately 15 heat pumps (50% air sourced and 50% ground sourced) in the SPN area from premises typical of LPN, and use of a “virtual feeder” network configuration within the ODS, to predict the effects on our distribution system as if they had been in LPN.
- e) Direct contact with UK Power Networks customers, two current leads who have commercial installations totalling c. 30 heat pumps.

Appendix 3 illustrates the marketing brochure used to advertise the project to potential heat pump trial participants.

It should be noted that the commencement of any heat pump trial is predicated upon the availability of a SMETS-1 smart meter, which is forecast to be available before the end of 2012.

The trial experiments will also be supplemented with case study and other data sources to provide robust trial outputs and reports.

### 2.3.4 Small Scale Embedded Generation (SSEG) trial participant recruitment

The project has developed four main channels to recruit SSEG trial participants:

- a) By direct contact with customers on lists of G83 connected PV units registered with UK Power Networks;
- b) Through contact with London Boroughs where PV units have been installed – particularly within the recently completed Low Carbon Zone initiative;

- c) Through dialogue with PV installers, developers, industry analysts and consultants. This dialogue is in the early stages. One example is Southern Solar, who have over 100 residential installations being offered to the project to participate in the SSEG trials; another example is the Peabody Trust who over some 13 commercial SSEG installations that are being offered to participate in the SSEG trials; and
- d) Through anecdotal/opportunistic contact made through informal contacts and networking e.g. Church of England, Diocese of London, where there is an ongoing initiative to install PV onto church roofs and the University of East London who have a large PV installation on their sports hall roof.

Again, PV trial experiments will also be supplemented with case study and other data sources to provide robust trial outputs and reports.

### 2.3.5 Distributed Energy trial participant recruitment

The recruitment of participants for the distributed energy trials has presented the most significant challenges. This is a complex proposition that from the participant's viewpoint can present a number of issues, not least the principle of handing over control of the generation installation and output to the DNO through an automated network management framework. A specialist independent I&C market research company has been engaged to assist with defining the market proposition. This has provided invaluable feedback in shaping the proposition going forward. The key elements from the research were around the complexity of the proposition and consequent lack of understanding within the marketplace and the absence of any incentive to participate.

The project has responded to the complexity issue by creating a number of sub-proposition's that offer varying levels of commitment and automation to the prospective client. These range from a "monitoring only" level of participation through to a full commitment to automated network management of installations by the project.

A recruitment task force is being established within the project during June and July 2012 to produce a targeted exercise to move potential participants through to committed engagement as a trial participant.

Currently propositions for 10 generation sets have been issued and technical evaluation commenced. Five (out of eight) central control ANM customers are in the final throes of the sign-up process. The project is working with a number of organisations such as Ener-G, who are a sustainable energy solution specialist who have identified approximately 30 potential sites and EON, who have approximately 10 CHP sites within LPN.

The project has also established contact with a number of individual building occupants such as the ExCel London centre, Ofgem's own London offices at Millbank and Siemens' new Crystal building in London's Royal Victoria Docks (and within the Mayor's Green Enterprise District). All these potential participants are expected to commit to participating in the distributed energy trials.

The project has identified the further potential for a subset trial involving decentralised CHP units, for example, installations at Roupell Park and Hyde Farm estate, which represent potential 500kW CHP units and 100 home (heat network) trial participants.

The project has also met with over 30 separate organisations, trade bodies, user associations, consultants, developers and government agencies to promote participating in the distributed energy trials within the project.

Appendices 4, 5, 6 and 7 illustrate the various distributed generation marketing brochures used to advertise the project to potential distributed generation trial participants, it comprises an overview brochure (Appendix 4) together with individual brochures describing the various distributed generation trial offerings.

### **2.3.6 Demand Response trial participant recruitment**

The project has three aggregators as partners to the project – EDF Energy, Flexitricity and EnerNOC and these partners continue to progress the acquisition of suitable demand response trial participants. The project is considering the addition of further aggregator capability which is currently being initiated through a formal “Expression of Interest” from other aggregators operating in London focussing mainly on building turn down aggregated demand response.

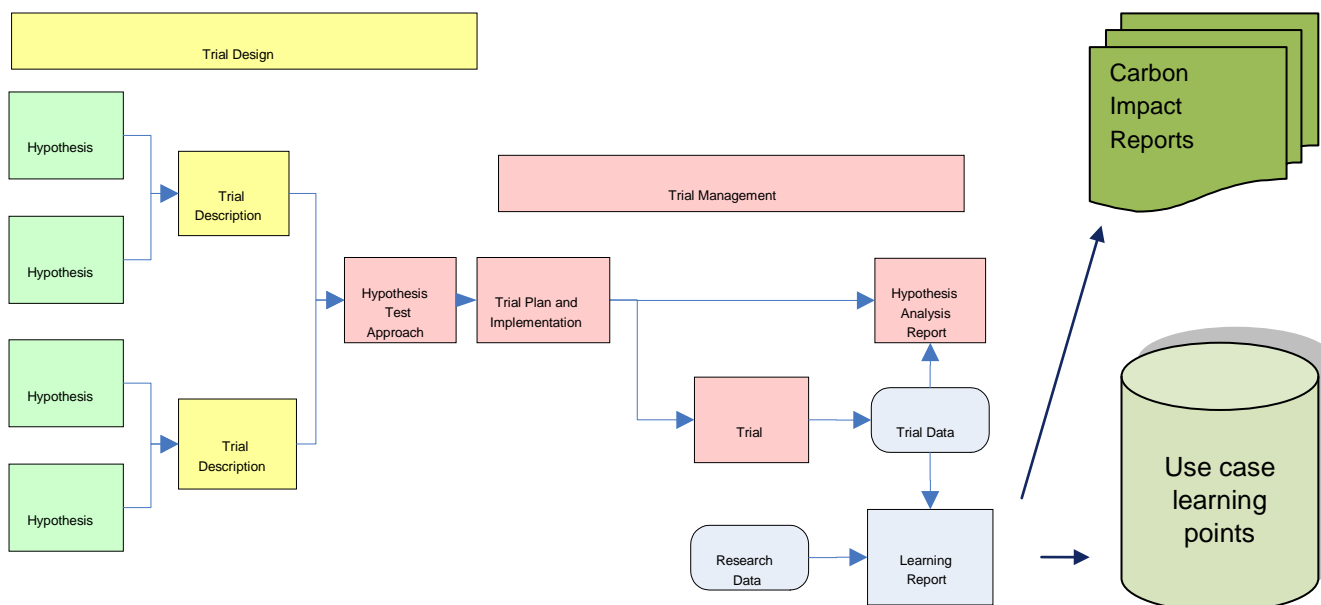
The project expects to have 24MW of demand committed to the project for the remaining trials in 2012 and 2013 and currently has 13MW of demand signed up to the project. We have also initiated a number of ‘real’ demand response calls, providing actual network relief with a further number planned through the various stages of the demand response trials.

## **2.4 Solution Design**

The detailed solution has largely remained unchanged as the technical detail has been fully defined in this reporting period. The main addition to the overall solution and architecture has been a new database to hold details of the trial participants – the participant management system (PMS). This database is a secure data repository holding details of the individuals, companies and organisations participating in the various project trials and complements the existing data repository, the operational data store (ODS) which is a premise-centric data repository.

The Low Carbon London technical solution is based upon a series of trial hypotheses that are each articulated within a trial hypothesis test approach describing the operational trial to be undertaken. The data emanating from the trials, supplemented by additional research data from other sources where appropriate, is then used to furnish the various reports and learning points. The solution design is nearing completion with the recently agreed dynamic ToU pricing and intervention schedule.

Figure 1 The Overall Solution and Deliverables



The project has identified some use case learning points that will not be delivered within the project. DECC has stipulated that all residential smart meters will be deployed as part of the national roll-out with an accompanying in-home device (IHD); this has precluded the learning point previously identified to ascertain the value of just having a smart meter without an IHD.

As has already been mentioned above, the objective to deliver a multi-partite contract between National Grid, demand aggregators, I&C customers and the DNO will not be delivered within the lifetime of the project. The project has initiated discussions with the various parties but the view amongst the parties involved is that due to the complexity of the issues involved, such a contract at national level will take many years to bring about and although the discussions initiated by the project will be fundamental to the eventual deliverable, it will not be feasible in the project’s timescales. This will also mean that the wind twinning demand trial objective will not be delivered as the multi-partite contract is a pre-requisite to that trial (however, it should be noted that the simulated wind twinning residential time of use trial will be retained). We continue to develop the concept, analysis and discussions with National Grid. All draft contract development outcomes and learning will be captured to feed into a future multi-partite contract if deemed the way forward.

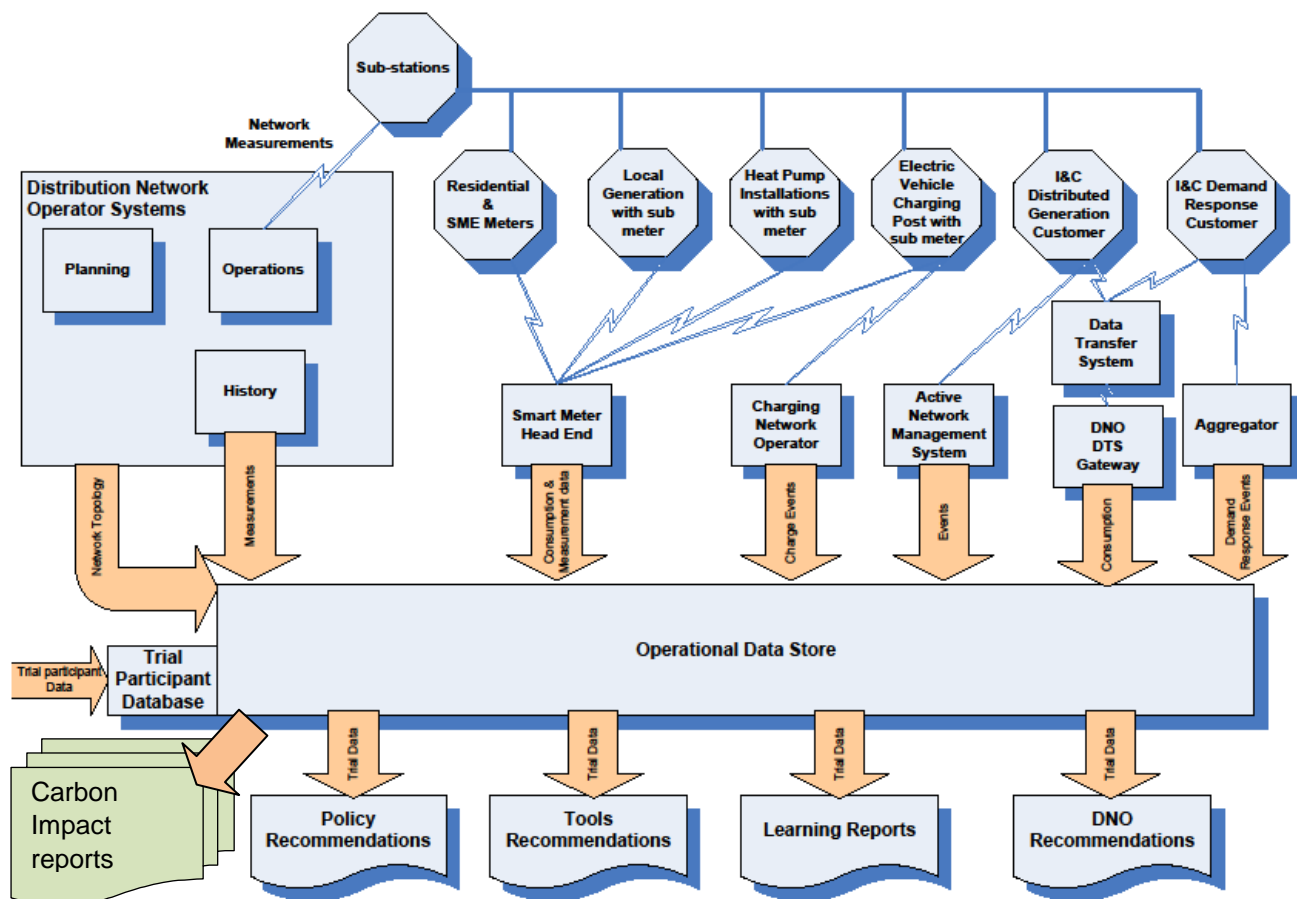
The use cases make frequent reference to SME’s, but always in the context of “residential and SME” trials. As originally intended, the project is not undertaking any SME-specific trials but will recruit SME’s as part of the residential tariff trials, as well as any SME’s who may join the EV, heat pump or PV trials.

The detailed design of the overall solution has remained consistent with the outline design as described within the original bid. The project has and will continue to capture data from residents (via smart meters), electric vehicle charging, heat pumps, residential generation (mostly photovoltaic), industrial generation and customers providing demand response. Some of this data is generated as part of normal business operations, however some will be created by the project instigating activity that will generate specific data, for example time of use tariffs due to simulated extra wind generation.



The trial-generated data will be stored in a central operational data store (ODS). The participant management system (PMS) will hold non-premise information related to trial participants, including meta-data obtained from surveys conducted with those partaking in the trials. Carbon impact reports will use trial data against pre-configured and certified algorithms to determine the carbon impacts of the project’s trial.

Figure 2 The Overall Solution Architecture



The project is gathering this data along with research data gathered by Imperial College, analyse it and present a number of findings in Learning Reports from Imperial College and other reports aimed at Distribution Network Operators to help with the introduction of Smart Metering, Smart Grids and the use of Low Carbon technologies.

The IT solution architecture provides the fabric that will enable data from the various trials to be collected and used for subsequent analysis. The overall IT architecture is described in Figure 3 below.

Customer data is held separately from trial data to ensure that customer data, held on a secure database, and is only accessed on an individually approved and documented basis, under the management and control of the recently recruited trials operations manager.

## 2.5 IT architecture and solution

The project has had to invest significant effort in developing a cogent, fit for purpose and comprehensive IT solution to support the trials. There are two secure data hubs that provide the repositories for all data input and collected by the project. Premise and network data is held in the Operational Data Store (ODS) whilst participant data is held on the Participant Management System (PMS): both are secure databases with access under the direct control of the trials operations manager and is additionally further reviewed by the quarterly Privacy Governance Group meeting, which oversees all data confidentiality and privacy obligations.

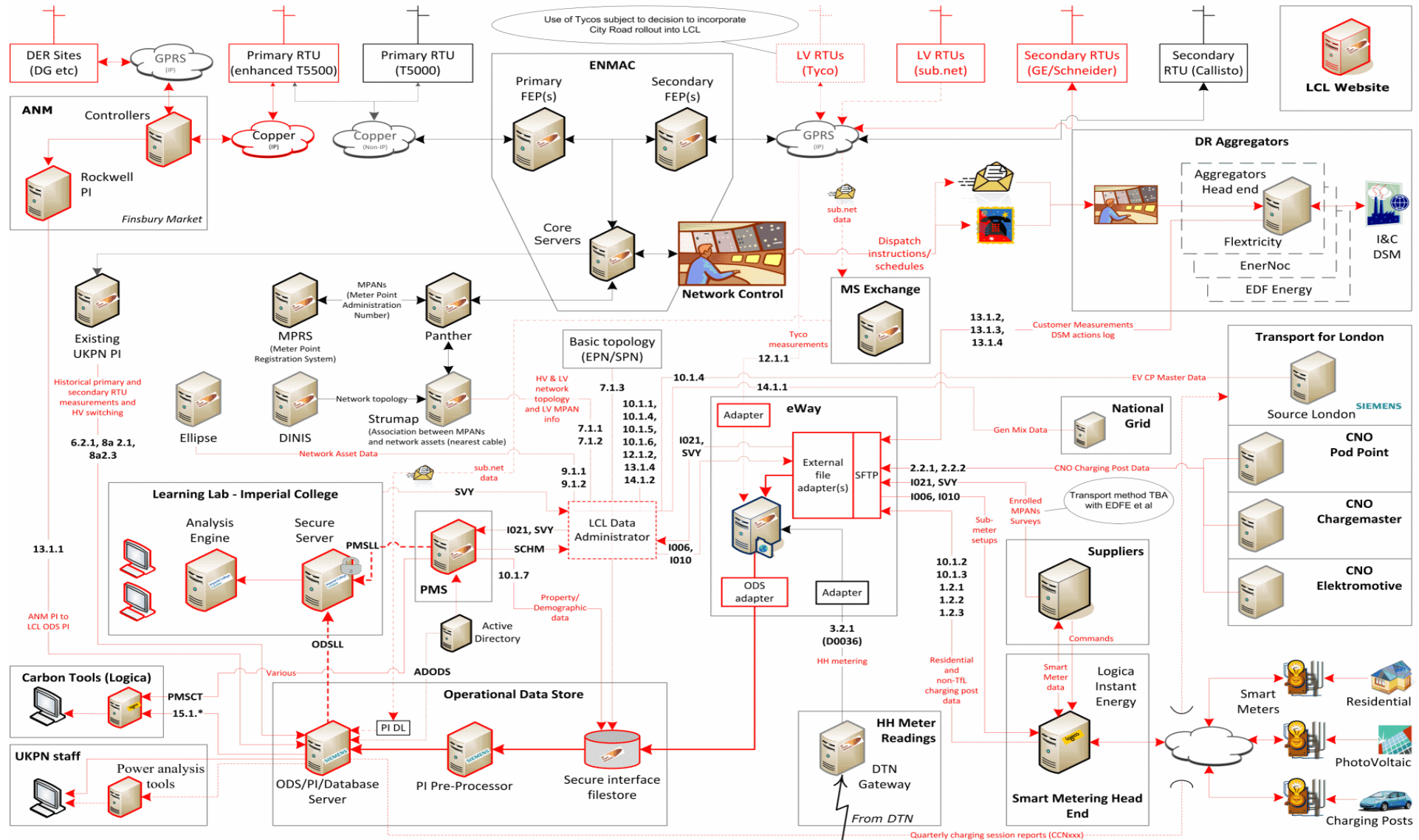
This reporting period has seen the specification, design, development and testing of the PMS being accomplished, which has subsequently allowed the successful completion of release 1 integrated system testing. Both release 2 of the ODS and releases 4 and 5 of the automated network management deployment (to be used in the distributed energy trials) have been successfully factory acceptance tested this month in their respective project partner locations.

Release 2 of the ODS and IT data integration system will be subject to full integration testing by September 2012 in readiness for trial data to be further collected and processed. For those meters already installed, the data is being held securely within the smart meter head-end system in Logica's secure data centre (Logica being the project partner providing the smart meter head-end solution).

The current version of the complete IT system architecture is described in Figure 3 below.

Figure 3. IT Architecture

### LCL Logical Application Architecture – v11.7 06/06/2012

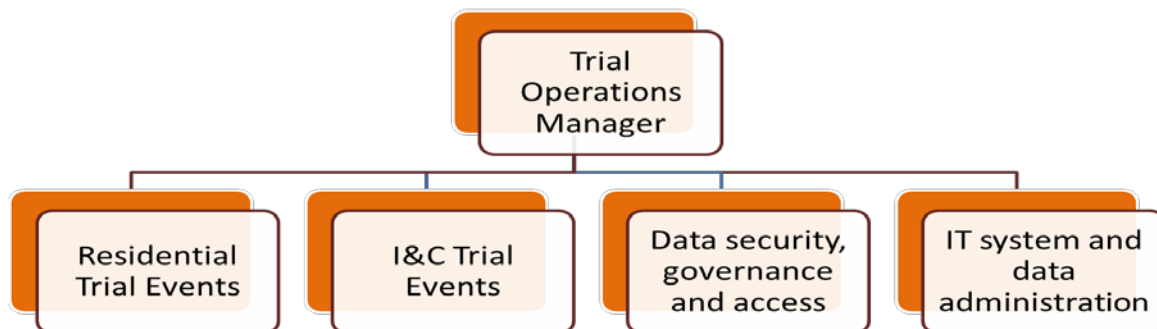


## 2.6 Trials Operations Team

The project has a sizeable portfolio of trials to carry out across both residential and I&C participants. These trials will be carried out by a separate trials operations team who will carry out each trial according to the instructions contained in each relevant project workstreams’ trial operations manuals. The team will maintain a fully documented record of each trial and the outcomes observed. This team will also be responsible for the production data held in the ODS and PMS systems, and will control and administer the security access to those systems. The trial operations manager has been recruited within this reporting period and is currently recruiting the rest of the team.

The proposed organisation of the trial operations team is described in figure 4 below.

Figure 4 – Trial Operation Structure



## 2.7 Winter 2011 Demand Response Trial

The project has carried out its planned winter 2011 demand response trial during the period December-April 2011. This involved a series of calls to demand aggregators for generation capacity, all of which were successfully met. All calls for generation were met from standby diesel generation installations. The results from this trial have been used to calculate the initial carbon impacts report which will be delivered by the end of June 2012.

Subsequent demand response trials are planning to specifically require and include building turn-down and aggregated generation to be included within the provided capacity from demand aggregators. Trials are planned for summer 2012, winter 2012 and spring/summer 2013. A major learning dissemination event was subsequently held in May 2012 to present the findings, learning points and issues arising from the trial (see 2.8 below). This event included presentations from all three of the project’s demand aggregators as well as UK Power Networks personnel and covered both the findings from the trial and issues raised.

## 2.8 Learning Dissemination

The Low Carbon London has a strong fundamental commitment to sharing the learning from the project – not just at the end of the project but during the trials to share emerging and early learning. This commitment takes many forms, from holding formal learning events were other

interested parties are invited: such as customers, other DNO's, regulatory bodies, industry players, local government and other trial projects and associated activities, through to regular internal UK Power Networks forums where the benefits, challenges and issues about moving towards a sustainable low carbon electricity distribution network are discussed.

During this reporting period, two major learning events were held. One to present the findings from the first phase of the smart meter roll-out, covering over 500 trial participants and the second held to present the learning from the winter 2011 demand response trial. Both events were extremely well attended and received. The project also has engaged with many institutions on a London-wide, national and international basis to interact with interested parties. The learning from these events is discussed in more detail in section 8 below.

An e-newsletter (Appendix 8) has also been produced, with regular quarterly editions being published to keep the wider community informed of progress. The project's website ([www.lowcarbonlondon.info](http://www.lowcarbonlondon.info)) also explains the project in some detail, as well as enabling trial participants to enrol online. The project is about to start a major communication channel through social media and will be looking to actively interact with others on a global basis through blogs, wikis, tweets etc.

### **2.9 Monitoring tools and safe systems of work**

A considerable amount of analysis has been undertaken to determine the most effective locations to place monitoring equipment as part of the various trials. 30 network monitoring devices have been ordered with two devices already connected to the network. The planning of the exact locations has been impacted by the dependence upon meter locations which are in turn dependent upon the locations of smart meter trial participants across London in the London Power Networks plc (LPN) licensed area. Once the locations are identified, likely to be completed by Q3 2012, the detailed planning and data quality reviews can be instigated. This has been an iterative exercise due to the project having to flex its locations policy in the light of participant recruitment challenges.

A safe system of work has also been designed, developed and approved by UK Power Networks' Health and Safety directorate to cover the retro-fitting of the monitoring equipment into the distribution network within live operational substations, customer's premises and homes.

### **2.10 Carbon Impact Reporting**

The project has a fundamental commitment to measuring and reporting on the carbon impact of low carbon tools and technologies used in the project. This reporting period has seen the creation of the first carbon impact report using data gathered from the winter 2011 demand response trial. Further reports will be produced throughout the remainder of the project to document the carbon impacts measured within the project's trials.

### 3. Business case update

The declared tangible benefits within the project are £1.8m of deferred infrastructure investment – derived from the impact of demand response within LPN from substations approaching firm capacity limits. The project is forecasting to deliver these as part of the demand response trials and will be analysed within the DNO reports produced at the end of the trials. Subject to the outcome of these trials, it is anticipated that future changes to Energy Networks Association Engineering Recommendation P2/6 and ETR 130 may be required to be modified in order to reflect the opportunities surrounding Demand Response Management (DRM) to contribute to network security and resilience and to potentially avoid or defer network reinforcement in some circumstances.

The intangible benefits emanating from the project are primarily articulated through a series of learning points derived from the project’s trials. These are supplemented by a series of carbon impact analysis reports documenting the proposed carbon savings from the trials.

The project will document any learning points expected to be de-scoped as part of the change request to be submitted by end of July 2012.

The following learning points are expected to be de-scoped within that change request – subject to approval by Ofgem - and driven by learning already gleaned within the project:

- Smart meter without an in-home device
- Multi-partite demand response contracts between National Grid, demand aggregators, I&C customers and DNO’s.

### 4. Progress against plan

#### 4.1 Progress against plan

The previous progress report identified a series of milestones for this current reporting period, and the table below summarises these and the progress made against them.

Table 2: Progress against plan:

Month	Year	Milestone	Type	Progress this period
January	2012	Learning event on initial 500 customers and meters	Internal milestone	Delivered
April	2012	Heat & Transport; offer TOU tariffs to customers	Internal milestone	Proposed to be reviewed as detailed in this report (to be delayed to commence Q4 2012)
May	2012	LCNF Conference	External milestone	Postponed to October 2012
June	2012	Institute for Sustainability; next tranche of bids for additional funding	Internal milestone	Delivered
June	2012	6 monthly Ofgem PPR	External milestone	Delivered

### 4.1.1 SDRC

The project is on track to deliver the SDRC relating to the initial carbon impact report by the end of June and has completed the first stage of solution implementation. The SDRC due this period relating to start of smart meter trials has started with the collection of smart meter data within the smart meter head-end IT system; this data will be uploaded into the ODS following completion of ODS release 2 solution testing by September 2012. The commencement of tariff and engineering trials will be scheduled to start by January 2013, but it is recognised that some flexibility will be required as dependant on recruitment success.

As noted in 2.2 above, the original project direction contained an SDRC erroneously scheduled for delivery by June 2012 – “Conclusion of ‘Using smart meters and substation sensors to facilitate smart grids’ trials” – this SDRC will be delivered in 2014, which is the logical position in the project schedule for this deliverable.

The project has focused primarily in this reporting period on trial participant recruitment across all trials. The recruitment of both residential and I&C trial participants has presented significant challenges to the project which have been addressed through extensive and exhaustive engagement and networking with potential participants and the development of incentives where possible to attract trial participants.

The trial operations team has been established, which provides a transparent and discrete vehicle to execute the various trials planned within the project, whilst also enabling consistency of knowledge and experts to be retained on the project by the optimised reuse of resources. This team will also take responsibility for all production data and ensure the project fully meets and complies with all its data protection and data privacy obligations.

This reporting period has also seen the finalisation of the detailed solution design and given that this is an ambitious and complex project with a series of separate but inter-related trials – the successful completion of the overall solution gives us a strong foundation with a high degree of precision and confidence to manage the various inter-dependencies and overall configuration.

Two major learning dissemination events were held during the reporting period, one to present the findings from the initial installation of smart meters and the second to present the findings from the winter 2011 demand response trial. Both events were very well attended and received, with representatives attending from both the rest of the GB DNO community and other international network operators.

The winter 2011 demand response trial saw a series of trial events calling for demand capacity successfully enacted. The data generated has been used as the basis for the carbon impact initial report and the basis for the design and finalisation of the forthcoming summer and winter demand response trials.

### 4.1.2 Outlook for next reporting period

The project’s outlook for the next reporting period covers a number of key objectives:

- a) Continued recruitment of residential smart meter participants using the existing “Gen 2” meter;
- b) Conversion of around 1,650 of these into dynamic time of use (ToU) trial participants (this assumes that 30% will agree to participate in the dynamic ToU trials);
- c) Scheduling of engineering trials once the SMETS-1 compliant smart meter is available;

- d) Continued recruitment of EV, heat pump and PV owners to participate in the appropriate trials;
- e) Creation of a task force to target I&C recruitment in the distributed energy automated network management trial area;
- f) Submission of the formal project change request to Ofgem in July 2012 coupled with a further review before the end of December 2012 to determine the exact shape of trials starting in 2013;
- g) Commencement of trial experiments within the learning lab – using either data harvested to date or assumed/dummy data from alternative sources; and
- h) Learning lab visualisation tools assessed and implemented within the lab.

It should be noted that there are no SDRCs due for delivery in the next reporting period, although project progress is tracked via a number of management and delivery milestones.

#### 4.1.2.1 Key issues in next reporting period

The availability of a SMETS-1 compliant smart meter of production quality and fully tested has been much delayed and although currently forecast to be available in Q3 2012, those trials that require a SMETS-1 smart meter (i.e. the engineering zone, SSEG and heat pump trials) will only be scheduled once the production availability of the device has been confirmed and the meters are available for bulk ordering.

The assumption of a 30% conversion rate for smart meter participants is optimistic – this is the rate required to provide a statistically valid sample size for the dynamic ToU tariff trials from the pool of 6,500 smart meters (which is already a 30% increase on the original base of 5,000 smart meters). If the actual take-up rate of smart meter trial participants agreeing to move onto the dynamic ToU tariff trial is less than 30%, which won't be known until late November 2012 at the earliest, then a decision will be taken as part of the December 2012 review with Ofgem on the way forward by January 2013. It is expected that trial experiments of a significant and DNO focused nature can still be carried out; and the learning and insight obtained will be of a significant and material benefit to the proposed national roll-out of smart meters.

The recruitment of trial participants for the remaining trials will again be the key focus of the project for the next reporting period. The creation of a task force to accelerate the recruitment through to full engagement in the I&C arena, and the exact nature of the commitment to participate (monitoring only or full active network management) will be a critical success factor in shaping the distributed energy trials in 2013.

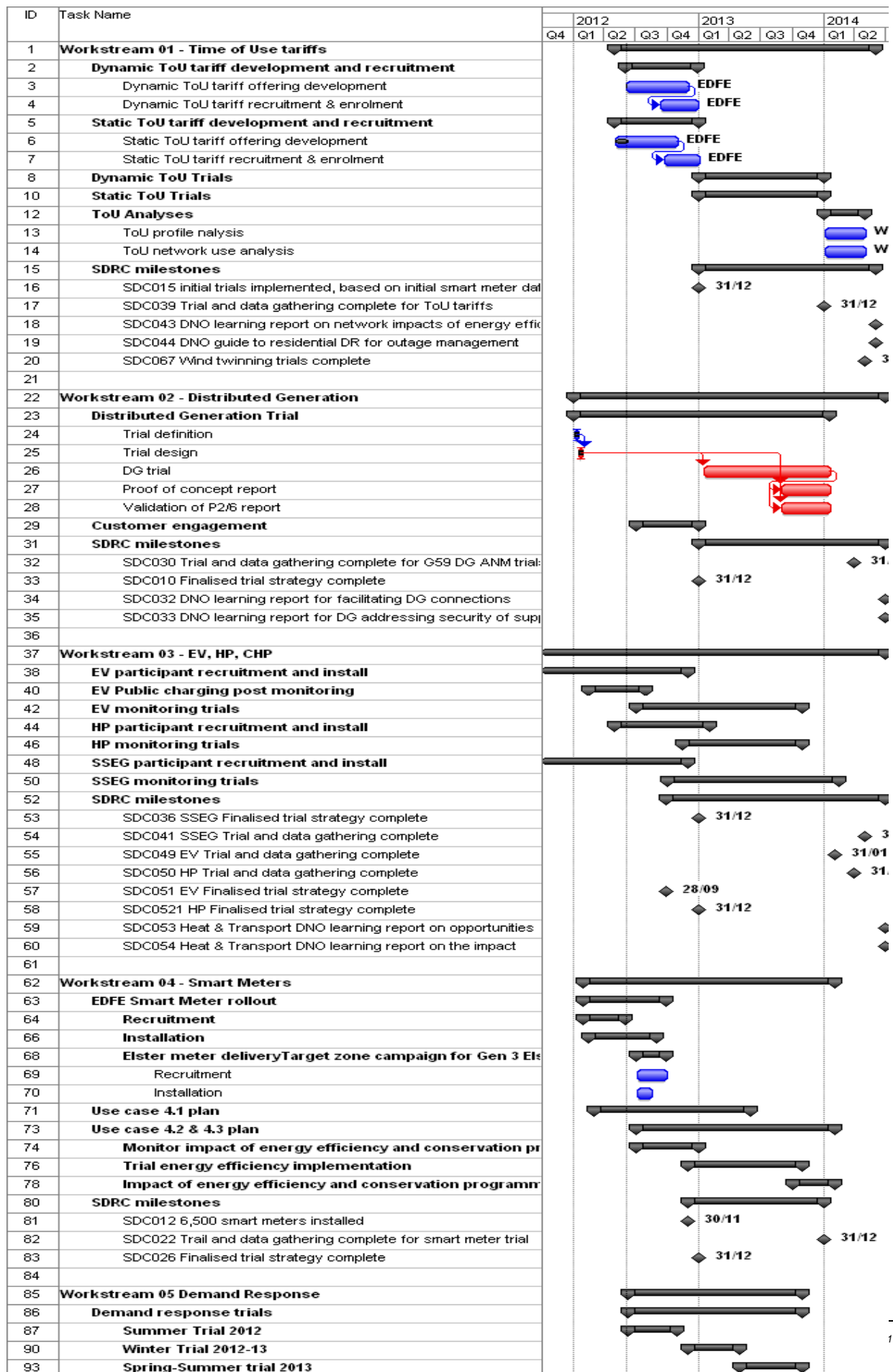
The summer 2012 demand response trial will push strongly for demand response derived through building turn-down rather than demand sourced from standby (diesel) generation only, although it is recognised that this type of demand response still provides extremely valuable benefit and learning.

The project will also continue to work extensively across a vast number of recruitment channels to encourage the highest number of EV owners, EV-using organisations, PV and heat pump owners to participate in the project's trials.

The summary project plan for the remaining key activities is described in figure 5 below.



Figure 5: Summary Project Plan



### 5. Progress against budget

The detailed financial analysis is contained in a separate confidential annexe.

It should be noted that the budget is behind that originally plan, principally due to a later start in the trials than anticipated, demonstrating robust financial controls and expenditure management. Additional costs have also come to light following a planning exercise but Low Carbon London intends to manage the Project within the original overall budget allocation.

### 6. Bank account

Details of this section are contained in a separate confidential annexe

### 7. Successful Delivery Reward Criteria (SDRC)

#### 7.1 SDRC this period

As stated in section 2 above, the project will meet its SDRC commitment to deliver the initial CO2 impact assessment report by the end of June 2012. The project has also met the SDRC to complete the first stage of solution implementation with testing of ODS release 1 completed in May 2012.

The project has delivered a number of other SDRC milestones due by the end of June 2012. However, the delivery of some elements of these SDRCs has been impacted and delayed by external factors, e.g. the delays in both the SMETS-1 smart meter and renewable heat incentive have impacted trial participant recruitment in some residential trials. The start of the metering and tariff trials has been delayed for up to six months from originally planned dependent upon further recruitment success rates and the willingness of smart meter participants to subsequently agree to participate in time of use tariff trials.

The project also had a commitment to deliver a documented multi-partite contract between National Grid, demand aggregators, I&C customers and UK Power Networks. Discussions have been held with all parties, the outputs of which have and will continue be recorded and presented. These interactions and meetings are highlighting this to be a highly complex area to develop into a formal contract and it is expected that any national contract will not be deliverable in the lifetime of this project. However, the project is working with another DNO on the feasibility and implementation of a tripartite demand response aggregation contract. This will be reflected in the change request to be submitted in the second half of 2012, which is subject to approval by Ofgem.

The project direction also contained an erroneously dated SDRC that was originally documented for delivery at the end of June 2012; this SDRC is triggered by the “conclusion of using smart meters and substation sensors to facilitate smart grids” – this SDRC should logically be delivered at the end of the engineering and time of use tariff trials, in 2014. This will be corrected within the proposed by end of July change request which will also include a rationalised SDRC portfolio for easier and more transparent management of the remainder of the project.

#### 7.2 SDRC in the next period

The project has no formal SDRC to deliver within the next reporting period but the second half of 2012 will see the project continue its recruitment of trial participants and will be working closely with Ofgem through the submission of a formal change request, further detailed monthly

reports. A further planned review in December 2012 with Ofgem will seek to agree the best way ahead, such that a clear pathway is set for the remainder of the project, the 2013 trials and the detailed interim activity to deliver successful and meaningful outcomes.

The project is also intending to present a rationalised set of remaining SDRC within the July 2012 change request, to form a more transparent method of assessing the project's overall progress and providing Ofgem with a more accessible and sharper level of scrutiny and oversight.

### **8. Learning outcomes**

The project held two major learning dissemination events during the reporting period, both very well attended by other GB DNO's, consultancies, London stakeholders and international energy network providers.

The project has also closely aligned with other trial programmes in the London region to ensure that early learning is effective in the design and delivery of those programmes, but also that time, effort and customer participation is optimised, and best use of resource maintained.

Low Carbon London has a detailed forum established within UK Power Networks to disseminate learnings and findings to the business for the benefit of our customers and to ensure that the design and development of future design, policies and procedures and the way the network is planned, developed and managed is done so informed by what is being discovered and learnt.

The project has established a number of international learning dissemination and sharing channels, including through the International Utilities Working Group (IUWG) with representatives of those organisations actively involved in smart meter and smart grid trial projects; as well as being represented at local, national and international conferences and seminars.

A programme of events and dissemination activities is currently being refreshed for the remainder of the project and this will be published on the project website [www.lowcarbonlondon.info](http://www.lowcarbonlondon.info), as well as other various learning event and project materials.

The project as also opened up a number of discussion avenues with customers, designers and stakeholders on the future design of installations and systems to enable a low carbon future and the various technologies to be implemented.

#### **8.1 Smart meter pilot learning event**

On 15 February 2012, the project held an event to present the findings and issues arising from the initial recruitment of smart meter trial participants. This event focused on the early learning emanating from the pilot exercise working with EDF Energy and Logica to install over 500 smart meters in residential homes. The key learning point was the need for close collaboration and teamwork, enabling feedback to be taken on board during the recruitment process to address issues arising and improve recruitment rates. The same material has since been presented to Government and DECC representatives and at Smart Grid GB (SGGB) and Smart Grid Forum (SGF) events.

Key individual learning points ranged from the need to simplify the terms and conditions so potential participants understood them, through to the targeting of residential landlords, who were a good source of potential participants. Other learning that was fed back during the recruitment process included additional training for customer service agents so that they could provide background to the project and improve the customer perception of the project itself and their role in it. A call ahead to the customer an hour prior to the installation appointment also reduced the number of no admittance failed installations.

The project networked extensively with local communities and other third parties such as Groundwork who were operating within the Mayor's Low Carbon Zone initiative and this provided an invaluable insight into customers' initial views and concerns about having a smart meter fitted.

On a more technical point, a number of early installations were found to be failing due to poor SIM card coverage; this was quickly addressed through the use of a range of network provider SIM cards to avoid such failures.

Photo 1 – the smart meter pilot learning event, London February 2012.



## 8.2 Demand response learning event

The project held a second major learning dissemination event on 15 May 2012, complementing the first in a series that occurred in 2011 to present the early findings and learning from the winter 2011 demand response trial. All three of the project's demand aggregators, EDF Energy, EnerNOC and Flexitricity presented alongside UK Power Networks personnel. The event covered a wide range of topics associated with demand response at the DNO-network level from a detailed explanation of the base-lining formulae used to calculate demand response energy through to a discussion of demand response conflicts and synergies around margin versus peak management. The event also covered a discussion on the carbon impacts of different types of demand response – standby diesel, other dispatchable generation (mainly CHP plant) and load management through deferring consumption.

The event described some of the challenges of recruiting participants into using an emerging market offering that is not as yet well understood or publicised when compared to National Grid STOR, as well as potential synergies, conflicts and confusion with the STOR offerings in the demand marketplace. The positioning of an offering that is potentially temporary and project-driven, in a market that is familiar with established STOR offerings was also discussed.

Photo 2 – the winter 2011 demand response learning event, London May 2012.



**9. Intellectual Property Rights (IPR)**

The project has not generated or registered any foreground IPR during this reporting period. Furthermore, it is not expected any foreground IPR will be generated or registered during the next reporting period.

**10. Risk management**

The project has taken an innovative and proactive approach to risk management within the various workstreams, with regular project-wide risk workshops and individual project workstream risk reviews on a bi-weekly basis, including identifying and implementing mitigations to those risks. Project-level risks are escalated to the monthly project steering group for review and confirmation of the mitigating actions, with a tracker review on preceding monthly status.

The table below describes the key risks to the project.

Table 1 – monthly risk assessment review dashboard

Risk Description	Owner	Cause & effect	Mitigation / resolution	Status	
				Previous Month	This Month
Smart meter demographic profiles - Unable to fulfill all Acorn groups in sufficient numbers	Project Manager	EDF Energy is unable to recruit sufficient numbers of smart meter participants in all the required Acorn demographic groups.  Significantly impacts ability to extrapolate findings or declare findings to be representative of London.	Investigate options to target recruitment to those Acorn groups. Use alternative marketing approaches. Revisit failed/unresponsive attempts. Extend recruitment timescales.	New risk	
UK Power Networks Olympic lock-down will impact LCL Programme	Project Manager	From April 2012 there has been a restriction on any change requests to UK Power Networks IT Control systems that are not deemed BAU. Merton is now captured within UK Power Networks' Olympic lock-down – likely to impact instrumentation of engineering zone trials in this location.	Mitigation strategy has been developed and is being reviewed monthly. Regular meetings with UK Power Networks IT stakeholders to assess impact on project. Progress clarification on whether Merton lock-down can be mitigated directly or via selection of another geographic area.		
6,500 EDF Energy smart meters may not be sufficient for statistically significant Dynamic ToU trials.	Project Manager	Programme has assumed a 30% take-up rate for dynamic ToU trials from 6,500 smart meter base, If this is too optimistic then the total number of meters required could be significantly more than 6,500 targeted. ToU recruitment to start (expected Sept-Oct 2012) once tariff is in place with EDF Energy – forecast end September 2012.	Formal Change Request to increase smart meter numbers from 5,000 to 6,500 in process. Implement early tracking system to obtain take-up rates as soon as available. Re-plan ToU workstream if needed. Oct-Nov 2012 before 30% can be verified with empirical data.		
IT requirements significantly under scoped and misunderstood.	Project Manager	Increase to cost, IT resource, project deliverables and testing/integration for data collection and storage readiness.	Weekly requirements review, detailed planning and scenario exercises. Key resource implementation. New PMS (Participant Management System) in development.		

Risk Description	Owner	Cause & effect	Mitigation / resolution	Status	
				Previous Month	This Month
Repeated delays in 3G SMETS-1 smart meter availability.	Project Manager	Repeated delays announced by selected 3G meter manufacturer Elster. Low confidence that latest forecast of availability (June 2012) will be met. Impacts engineering zone, PV and HP trials where this meter is required.	Delay engineering zone trials until 3G meter is available. Use 2G meter for tariff trials and EV residential secondary metering. British Gas integration to project as a supplier and smart meter use initiated. Potential for up to 500 meters and data throughput being developed for year end. Meter location mapping work commenced.		
Customer engagement for DG (ANM) trial uptake	Project Manager	Low level of customer sign up for ANM trials.	Accent market research proposal for customer proposition in development. Further meetings held with potential customers as well as positive leads from the recent CHPA meeting. Use incentives to attract participants where effective. Initiate recruitment task force to operate over June-August 2012		

**11. Other**

No items to report.

**12. Accuracy assurance statement**

I hereby confirm that this report, represents a true, complete and accurate statement on the progress of the Low Carbon London project in its third six month period, and an accurate view of our understanding of the activities for the next reporting period. A robust process was in place to produce the report.

Signed

*Ben Wilson*

Date

*15/6/12*

**Ben Wilson**  
**Director of Strategy & Regulation and CFO**  
**UK Power Networks**

### 13. Glossary of terms and abbreviations used

ANM	Active network management
CNO	Charging network operator
CHP	Combined heat and power
CHPA	Combined Heat and Power Association
DG	Distributed generation
DNO	Distributed network operator
DRM	Demand response management
EDRP	Energy demand research project
EV	Electric vehicle
HP	Heat pump
LCL	Low Carbon London
LCNF	Low Carbon Network Fund
LCZ	Low Carbon Zone
LPN	London power network
LV	Low voltage
PHEV	Plug-in electric vehicle
PV	Photo-voltaic
SDRC	Successful delivery reward criteria
SSEG	Small scale embedded generation
SMETS	Smart metering equipment technical specifications
ToU	Time of Use (tariff)



## 14. Appendices

The following files are appended as separate pdf documents.

- Appendix 1 Project overview brochure
- Appendix 2 EV brochure
- Appendix 3 Heat pump brochure
- Appendix 4 Distributed energy overview brochure
- Appendix 5 Distributed energy enabling trial brochure
- Appendix 6 Distributed energy monitoring trial brochure
- Appendix 7 Distributed energy security of supply trial brochure
- Appendix 8 e-newsletter