

# Low Carbon Networks Fund

## Full Submission Pro-forma

### Section 1: Project Summary

<b>1.1</b>	<b>Project Title:</b> <b>Solent Achieving Value from Efficiency (SAVE)</b>	<b>NON-CONFIDENTIAL VERSION</b>
<b>1.2</b>	<b>Funding DNO:</b> <b>Southern Electric Power Distribution (SEPD)</b>	
<b>1.3</b>	<b>Project Summary:</b>	
	<p>The SAVE project will robustly trial and establish to what extent energy efficiency measures can be considered as a cost effective, predictable and sustainable tool for managing peak demand as an alternative to network reinforcement. The project will target domestic customers only, and the measures to be trialled will include deploying a technology, offering a commercial incentive and taking an innovative approach to engagement.</p> <p>The project will be based in the Solent and surrounding area, South of England, where the Local Authorities are already creating challenges for the network as a result of implementing a strategy of supporting and encouraging local communities and businesses to develop opportunities and growth.</p> <p>On completion of the project UK DNOs will have a suite of tools to assess a particular network's suitability for demand reduction through energy efficiency measures and allow informed investment choices to be made between using customer engagement and energy efficiency measures as opposed to traditional measures and "smart" solutions.</p> <p>The project will also quantify the broader benefits of an energy efficiency measure to allow the complete value of the solution to be evaluated alongside the more network centric solutions.</p>	
<b>1.4 Funding</b>		
<b>1.4.2</b>	<b>LCN Funding Request (£k): 9,975</b>	
<b>1.4.3</b>	<b>DNO Contribution (£k): 1,224</b>	
<b>1.4.4</b>	<b>External Funding - excluding from NICs (£k): 1,581</b>	
<b>1.4.5</b>	<b>Total Project cost (£k): 13,197</b>	

# Low Carbon Networks Fund Full Submission Pro-forma

## Section 1: Project Summary continued

**1.5 Cross industry ventures:** If your Project is one part of a wider cross industry venture please complete the following section. A cross industry venture consists of two or more Projects which are interlinked with one Project requesting funding from the Low Carbon Networks (LCN) Fund and the other Project(s) applying for funding from the Electricity Network Innovation Competition (NIC) and/or Gas NIC.

**1.5.1 Funding requested from the Electricity NIC or Gas NIC (£k, please state which other competition):**

**1.5.2 Please confirm if the LCN Fund Project could proceed in absence of funding being awarded for the Electricity NIC or Gas NIC Project:**

- ☐ **YES – the Project would proceed in the absence of funding for the interlinked Project**
- ☐ **NO – the Project would not proceed in the absence of funding for the interlinked Project**

### 1.6 List of Project Partners, External Funders and Project Supporters:

#### Project Partners:

Future Solent – provider of local contacts and data; University of Southampton – data analysis and model preparation; ELEXON – Time of Use tariff and DNO incentives; DNV KEMA – International learning, project methodology, trials managers and learning; Wireless Maingate – International learning and technology providers; University of Bath – data analysis and model preparation

#### Project Suppliers:

University of Winchester – Engagement media; CGI – Smart meter data provision; Neighbourhood Economics – Community Coaching. British Gas, Coop Energy, Flow Energy, Ovo and Southern Electric have signed letters of intent (all other suppliers have been invited to take part in the trials)

#### Project Supporters:

Partnership for Urban South Hampshire (PUSH), Hampshire Chamber of Commerce, SmartGridGB

### 1.7 Timescale

#### 1.7.1 Project Start Date:

1<sup>st</sup> January 2014

#### 1.7.2 Project End Date:

29<sup>th</sup> June 2018

### 1.8 Project Manager Contact Details

#### 1.8.1 Contact Name & Job Title:

Brian Shewan, Development Manager

#### 1.8.2 Email & Telephone Number:

brian.shewan@sse.com  
 +44 (0) 1189 534681

#### 1.8.3 Contact Address:

Scottish and Southern Energy Power  
 Distribution  
 55 Vastern Road  
 Reading  
 Berkshire  
 RG1 8BU

# Low Carbon Networks Fund

## Full Submission Pro-forma

### Section 2: Project Description

This section should be between 8 and 10 pages.

#### 2.1 Aims and objectives

##### Aim

Through this project we aim to produce a network investment decision tool that will allow DNOs to assess and select the most cost efficient methodology for managing a network constraint.

##### Objectives

The aim will be achieved through the following objectives:

1. Create hypotheses of anticipated effect of energy efficiency measures (via commercial, technical and engagement methods)
2. Monitor effect of energy efficiency measures on consumption across range of customers
3. Analyse effect and attempt to improve in second iteration
4. Evaluate cost efficiency of each measure
5. Produce customer model revealing customer receptiveness to measures
6. Produce network model revealing modelled network impact from measures
7. Produce a network investment tool for DNOs
8. Produce recommendations for regulatory and incentives model that DNOs may adopt via RIIO

##### Problem

The report from Work Stream 3 of the DECC/Ofgem Smart Grid Forum "Assessing the impact of low carbon technologies on Great Britain's power distribution networks" presented cost figures for conventional reinforcement of the network if innovation levels were increased. It revealed that a typical low voltage reinforcement project involving cabling only can cost approximately £80,000 whilst a larger low voltage reinforcement involving a transformer replacement can cost approximately £250,000. Targeted investment to deal with demand growth means that this level of investment is seen as sound and sustainable, and providing the capacity for growth. The uncertainty in today's climate will see in many cases energy efficiency reduce demand and low carbon technologies change demand profiles. In many cases where this occurs the long term need for reinforcement may be negated. However the uptake of energy efficiency does not link perfectly with network constraints so in many places reinforcements will still be required but ultimately may become stranded assets as energy efficiency grows. This project seeks to synchronise energy efficiency with the network problem hence avoiding or deferring the need to invest in traditional solutions.

As the Solent region is recognised as a major growth area its electrical demand is forecast to increase and the electrical demand profile is anticipated to change to reflect a high uptake of low carbon technologies. A major part of the DECC Carbon Plan focuses on making UK homes greener and less energy intensive. The SAVE project will help to evaluate the role DNOs can play in this process.

In addition, the Local Authorities and the Future Solent initiative (a public sector support body responsible for the development and delivery of the low carbon plans for the Solent

## Low Carbon Networks Fund

### Full Submission Pro-forma

### Project Description continued

area) are actively promoting a Low Carbon Economy to develop business opportunities and growth. The distribution substations may not be able to accommodate further significant increases in demand without being upgraded. Furthermore, unless effectively managed the anticipated changes in demand levels and load profiles will trigger network problems prompting costly and disruptive reinforcement. This story is repeated across the UK.

#### **Methods**

The project will evaluate the potential for DNOs to instigate different types of “energy efficiency measures” which will incentivise customer behaviour change resulting in reduction of peak and overall demand on the electricity distribution network. We will compare the impacts of five energy efficiency measures (Methods – described in more detail in section 2.3) which use combinations of technology, commercial rewards and engagement campaigns informed by energy consumption and demographic data. The project will identify the energy efficiency measures which are most cost effective in terms of achieving demand reduction.

The project will develop a “market matrix” of relevant programmes, incentive mechanisms and opportunities operating in other regions to look for learning that can be applied in GB.

#### **Trials** (see Appendix F for trial summary diagram)

The trials will consist of evaluating 5 energy efficiency measures on participants in the Solent region. The methods have been chosen to allow an assessment of multiple factors, such as cost and effort required to install/implement, etc. Note: LEDs have been chosen as they have been considered to be the best option in the current market to test customer reception to a technological intervention.

The trials involving Methods 1-3 will be managed by DNV KEMA, the trial of Method 4 will involve Suppliers and be facilitated by ELEXON, whilst the trial of Method 5 will be managed by Neighbourhood Economics. Analysis will be carried out by the University of Southampton and University of Bath. Methods 1-3 will each have a sample group of up to 1,000, with up to a further 1,000 making up a control group for comparison. Method 4 will also involve a sample group of up to 1,000 with up to 1,000 more making up the control group. Method 5 will involve community coaching and will be targeting 2 neighbourhoods typically comprising up to 1,000 properties. Like the other methods these will also have control groups, made up of similar neighbourhoods of up to 1,000 properties.

It is important to note that the recruitment rate is part of the trial itself- understanding uptake rates is an important stage in measuring impacts. The sample sizes are the ideal, yet if the numbers do not reach the desired levels it will simply mean that it may be harder to determine small changes in behaviour. If the changes are so small then the model will still be valid as it will still reveal the method(s) that yield only small changes in consumption.

## Low Carbon Networks Fund

### Full Submission Pro-forma

### Project Description continued

The 5 methods are:

1. LED installation
2. Data-informed engagement campaign
3. DNO price signals direct to customers plus data-informed engagement
4. DNO price signals to Suppliers to pass through to customers
5. Community coaching

These methods are described in detail in section 2.3.

#### **Solutions**

As a result of identifying the effectiveness of each energy efficiency measure we will produce an investment decision tool that will allow DNOs to assess and select the most cost efficient methodology for managing a particular network constraint and most effective for its connected customer types. See Appendix G for the SAVE model and Appendix H for the planning model diagrams.

Current practices do not support the deployment of energy efficiency measures as a cost effective tool in comparison with traditional network investment, and are currently not considered when designing networks. The results of the trials will enable this to be considered as a solution and implemented as an alternative to traditional network reinforcement/planning, with the DNO costs also established.

#### **2.2 Technical description of Project**

As stated the project intends to use technical and commercial measures as well as proactive customer engagement to promote energy efficiency (a change in consumption levels and patterns).

The technical means of facilitating energy efficiency will involve utilising LED lighting in one trial, and the provision of meter sensors and smart plugs in another. The trial utilising sensors and smart plugs will provide graphical views of total property and individual appliance demand, and this data will be used to inform the campaigns as part of the proactive customer engagement approach (effectively meaning the trial utilises both technical means and proactive engagement).

Commercial means of promoting energy efficiency will involve two trials. The first will use smart meters and innovative tariffs as a means of suppliers passing price signals on to customers in a bid to alter their electrical demand. The second will encourage customers without smart meters through a target-related reward that is provided directly by the DNO. Both will test the sensitivity of customers to incentives and the scale required. As a result ELEXON will design a blueprint for an energy efficiency incentive measure that Ofgem may consider implementing as a future phase of RIIO, by making recommendations on the type and level of incentive that would be necessary to ensure DNOs and suppliers adopt these measures.

The third method employed will involve proactive customer engagement to create behaviour change. This will involve two trials, with one trial drawing upon a range of targeted methods that will include apps to monitor energy efficiency and media material in the form of

## Low Carbon Networks Fund

### Full Submission Pro-forma

### Project Description continued

targeted short film clips and printed flyers. Under the guidance of DNV KEMA the University of Winchester will create a campaign strategy and produce the bulk of the media material, drawing upon the experience and expertise of their Media Department. The other trial will realise further proactive engagement thanks to Neighbourhood Economics and their work on SEPD's IFI project 'Community Energy Coaching Programme', by targeting neighbourhoods and embedding a Community Coach to engage with customers and change behaviour via a range of means, including community actions.

The innovation in this project's methodology stems from the fact that it is aiming to quantify the network benefits of various energy efficiency measures, focussing on both electrical peak demand and daily demand profiles, resulting in the creation of a tool for a DNO's network planning teams to utilise in the future. Also, to ensure the results are statistically valid and therefore strengthen the reliability of the tool the trial size and selection of trial participants have been influenced by the University of Southampton and their expertise in designing trials.

#### **2.3 Description of design of trials**

##### **A. Introduction**

The trials will define the relative value to distribution networks of using different energy efficiency measures to reduce network demand. To do this two key metrics will be developed to describe the performance of each trial method. These are:

- £ spent per kW reduction (peak)
- £ spent per kWh reduction (overall- in the 6 month trial iteration periods)

These two metrics will allow the energy efficiency methods to be compared and ranked objectively against each other to show which are most effective to be used to meet different network needs. Furthermore, by analysing which types of customers responded in different ways to energy efficiency methods, it should also be possible to conclude which methods are most effective, reliable and sustainable. From a network perspective the value of changing consumption levels changes with time (greater value in addressing winter peaks) and so the network model will be developed to address this to allow the quantification of both network and economic benefits.

Customer engagement sits at the core of the project and forms part of every trial in order to understand the most effective way of engaging with different types of customers in order to maximise their response. Therefore, much of the most useful learning in the trials should come in this area.

The structure of the trial approaches also has two innovative characteristics that should maximise the opportunity to learn during the project. These are:

- an iterative development approach – there are planned to be two trial periods which allows learning from the first period to be assessed and used to inform the approach for the second trial period. This will include learning from both aspects that worked, and those that didn't work
- the project has a competitive element as different methods will be evaluated against objective metrics (as explained above). This should enable ranking of energy

## Low Carbon Networks Fund

### Full Submission Pro-forma

### Project Description continued

efficiency methods against each other and an understanding of their relative effectiveness in different situations and with different customers

The trials will take a statistically robust approach so that conclusions have a consistent, solid and credible basis. This is reflected in the sample sizes and approach to recruitment and has been informed by University of Southampton (UoS), who have stated that the project should commit to carrying out trials of the highest quality in order to achieve the following objectives:

- ability to distinguish between effects caused by selection and by actual measures
- ability to distinguish between novelty effects and longer term change
- to be able to detect statistically significant effects
- to allow the results to be extrapolated to the general customer population

#### **Sample size and region**

Other LCNF projects that have looked at time of use tariffs have suggested 7% overall reduction with a 14% reduction during the peak tariff period (source: LCNF Customer-Led Network Revolution project). The University of Southampton have advised that the ability to observe a particular sized reduction (and determine it as attributable to the project) dictates the required sample size. If we assume we will see a similar reduction of 7.5% then the effective sample size required for a statistically-robust trial method becomes 1000 properties. For value for money we will use a factorial design as this reduces the total number of properties required to study and therefore the costs while still maintaining the sample size required to observe the effects under study (see Appendix I).

The overall Solent region has been selected as the target area for the study within the project. This will facilitate rigor and significantly improve potential impacts in both analysis and outcomes. The need for a larger region of study (as opposed to simply a Council district or town) is based on the following premise:

- the eventual 'network effects' model needs to be able to estimate the local 'impacts' of the intervention measures across all population groups and therefore across all areas, meaning we must have control and test samples which are representative of all entities in the Solent area; and
- by assuming that there are no specific 'living in the Solent region' effects then the dataset and the results can also be used to model effects across all DNOs

In order to obtain a cross-section of customers the project will recruit from a range of areas: urban; suburban and rural. This will avoid any bias that could arise from sampling in only one area by reflecting the full diversity of socio-economic and demographic characteristics across the region.

#### **Sampling process**

The approach will apply standard best practice academic and Market Research Society (MRS) techniques to the recruitment of the customers and to the entire data collection processes, using an experienced professional market research agency with MRS accreditation for recruitment and surveys to ensure an expert and cost-effective approach. Having taken the learning from other LCNF projects we have taken the decision to employ a tried and tested MRS-accredited agency to support the University of Southampton and mitigate the risks associated with trial recruitment. It is important to note the use of such an agency is not currently considered in a Business As Usual solution- although it could form part of the solution in the future.



## Low Carbon Networks Fund

### Full Submission Pro-forma

### Project Description continued

Best practice within the academic and market research survey sectors dictated our use of a randomised stratified approach by indicating that it is the only effective way to generate a representative random sample sufficient for our analytic needs (see Appendix I).

It is important to note that the SAVE project's approach has been taken to avoid issues which have been seen in other LCNF projects (recently documented in the 'Project Lessons Learned from Trial Recruitment paper' for the CLNR project). The approach will ensure that the results, and subsequent ability to extrapolation to other networks, are statistically sound and reliable (see Appendix I for further information).

**B. High-level concept** (see Appendix J for high level project concept diagram)  
As seen in the high-level project concept diagram at the core of the project sits a model of customer response which will be set up and maintained by the University of Southampton (UoS). This model will be informed in the first instance by an initial research phase which will review findings from energy efficiency programmes from around the world and how they have engaged with customers. In parallel, the demographic and energy use characteristics of Solent customers will be investigated by the UoS based on work they have already undertaken (and reinforced by information from the project partners).

Findings will be combined with Solent customer segments and analysed to understand which customer demographic characteristics are most important to consider for grouping into trial groups. This should enable the profiling and segmentation of customers within the model of customer response. This model will allow the development of initial hypotheses to act as the basis for the first trial period. Once the first trial period is complete these will be assessed and evaluated based on both quantitative results (electricity reduction and the associated cost to achieve it) and qualitative feedback (surveys and questionnaires filled in by participants), with the results fed back in to update the customer model and the associated customer profiles. The academics analysing the results are aware that customers are likely to change their behaviour subconsciously and so they will look to draw out these observations from the results. This should refine understanding of methods and customers and allow for updated hypotheses to be developed and trialled in a second trial period. Results will also be fed into a network impacts model which will take data on energy reductions and apply it to a virtual network to understand what the potential network impacts would have been. The final output will be a combination of the customer model and network model, which will be an investment decision tool for DNOs.

**C. Project phases** (see Appendix K for project phasing diagram)  
The project splits into five operational phases:

**Phase 1 – Preparation and recruitment**, is planned to last for the first 18 months of the project (January 2014-June 2015) and focuses on setting the foundations of the trials. To begin with, a Customer Engagement Plan and Data Protection Strategy will be developed and reviewed with Ofgem before any customer-related activity takes place. In parallel, the desktop research will be undertaken to look at learning from other energy efficiency and LCNF programmes, and to investigate Solent customer characteristics.



## Low Carbon Networks Fund

### Full Submission Pro-forma

### Project Description continued

ELEXON will lead on the recruitment and ongoing engagement with Suppliers adopting a “whole market” approach rather than working exclusively with one large Supplier, In this sense one project will aim to replicate as far as possible live market conditions.

Once the customer engagement plan is agreed, recruitment for the trials will commence. Customers will be required to participate for the full period of their trial and for methods 1-3 this requires the installation of monitoring equipment supplied by Wireless Maingate (“Maingate”) to record electricity consumption. Please see Appendix L for Maingate’s proposal. This monitoring equipment will later allow participants to understand when they are using electricity (via access to an online portal or letter) so that they are better able to respond to stimuli, as well as smart plugs in the engagement campaign and network rebate groups to collect data on the usage of specific appliances which can be used to enable more sophisticated campaign messages. Participants for method 4 (ToU tariffs) will require the installation of smart meters to record electricity consumption, whilst participants for method 5 (Community Coaching) will be selected at a neighbourhood-level and substation monitoring installed to monitor consumption.

In the latter part of the first year, and once the desktop research has been completed, the customer model will be developed and an initial view of trial groupings will be developed based on the recruitment outcomes. The aim will be for groupings to be consistent in terms of their demographic make-up.

**Phase 2 – Initial monitoring**, is a six month period (July 2015-December 2015) when a base set of data can be collected from trial participants. It is planned that this will run from July-December to ensure coverage of both summer and winter periods and the associated seasonal changes in consumption levels. The ability to view and assess impacts on winter peaks is of significant value to a DNO. Six months has been chosen as it will allow 2 trial iterations to take place and also ensure that there is a directly comparable six month period from July-December where monitoring of responses to the methods can be compared to the initial baseline monitoring period. Note: there will still be visibility of consumption in January-June and comparisons can be made against the control group’s consumption in that same period. As real data is collected from this monitoring period, it will be used to update the customer model. This should enable the refinement of the customer groupings and formulation of initial hypotheses for the first trial iteration.

**Phase 3 – First trial iteration**, will last for one year (January 2016-December 2016). Both trial iteration phases are split into two six-month periods. The first period will give time to install technology, start tariffs and begin engagement campaigns; whilst the second period will allow a full six-month period of monitoring participant responses to the different methods deployed against the original July-December monitoring period. During this time, data will be collected, the customer response model will be updated and hypotheses will be refined.

**Phase 4 – Second trial iteration**, has a very similar format to Phase 3 (this time running from January 2017-December 2017). However, in this case, the first six-month period will

## Low Carbon Networks Fund

### Full Submission Pro-forma

### Project Description continued

be used to review the outcomes and learning from the first trial iteration in order to update the approach for each method. This will either be to improve delivery (e.g. how to target participants that did not engage in the first iteration), or to simply do things differently or more cheaply (e.g. to offer a lower rebate, or engage with participants on a more sophisticated basis through analysis of their appliance usage).

**Phase 5 – Conclusions and wrap up**, is the final assessment of outcomes and conclusions from the project, and the collection of final feedback. This includes the production of key reports to present important findings and to interpret them into regulatory and network implications. This period (January 2018-June 2018) will also see the closing of the project from a practical perspective including the removal of some project equipment, etc.

#### **D. Description of trial methods**

The trials plan to utilise five different energy efficiency methods to allow comparisons between their relative effectiveness. All the methods have the same underlying objective and starting point, namely reviewing consumption data gathered at the start of the trials to identify what demand reductions/shifts need to be achieved to benefit the network, which will inform the engagement approach as to what behaviours/specific consumption patterns need to be encouraged/discouraged to achieve this. The methods will diverge as each one goes to trial a different means of achieving the target, then converge again as they all give a common measure of demand to enable comparison.

**Method 1 – LED installation:** One sample group will be targeted for LED installation. This trial will test this method from two perspectives; both the ability to engage customers to agree to having a package of LEDs installed, and then the impact of the LEDs on electricity consumption once installed. LEDs will be offered free to customers, reflecting a real-world situation where the network may pay for LEDs to be installed. For the second iteration, a different engagement approach may be considered to target those participants who did not agree to an installation in the first iteration. This would be based on participant feedback from the first iteration.

**Method 2 – Data-informed engagement campaign:** A second sample group will be targeted by a focused customer engagement campaign. The campaign will use data from monitoring (both of overall household and of appliance-specific consumption) to make messages more sophisticated and tailored to different customer groups in a bid to achieve a sustained behaviour change and subsequent reduction in peak and overall demand, e.g. targeting customers using their washing machine over peak time. Customers will be able to view their consumption habits via an online portal or a letter to assist with the awareness and behaviour change. A variety of engagement techniques will be employed, which are set out further in Section 8. Again, campaigns will be set up and executed in the first half of the trial phases. For the second trial iteration campaigns there is scope to further tailor messages or use different techniques.

## Low Carbon Networks Fund

### Full Submission Pro-forma

### Project Description continued

**Method 3 – DNO price signals direct to customers plus data informed engagement:**

The third sample group will be subject to the same engagement campaign approach as in Method 2, but in this case participants will be able to earn a rebate from the DNO in return for achieving a targeted change in consumption. This rebate will be structured (in the form of a consumption-related target) to reflect the network's needs, such as reducing peak demand, and will be supported by engagement campaign messages. To inform the setting of this rebate, a network pricing model will be developed in the first part of Phase 3 to estimate the value for the network of reducing demand at different times in terms of potential avoided reinforcement (this work will also inform Method 4 – ToU tariffs). The pricing used in Method 3 will also be available to be utilised when collaborating with Suppliers. ELEXON will calculate and claim the value of the rewards from SEPD each quarter before distribution to customers as in Method 4.

**Method 4 – DNO price signals to Suppliers:** This trial will be carried out separately from the first three and involves a different engagement approach, utilising existing installed smart meters or coordination of new smart meters. At this point there is already expression of interest to supply more than the 2000 smart meter customers. Suppliers involved will work with UoS to identify 2,000 customers at whose homes they will install Smart Meters in Phase 1 of the trial. Monitoring will therefore begin in tandem with the 4,000 recruited participants for Methods 1-3.

As per Method 3, the network pricing model will develop estimates of the value of electricity usage reduction to the network at different times. To activate the tariffs SEPD will work with ELEXON to produce a series of price signals options. These will be discussed at industry workshops to determine that actual tariffs that will be tested. The suppliers will then incorporate this into their own formulation of ToU tariffs with their customers. The Suppliers and SEPD will work together to understand the effectiveness of the tariffs and iterate during the project.

During the operation of the trials ELEXON will validate the data exiting the project database, which is used to establish the level of eligible customer rewards in accordance with the tariff rules they have signed up to. ELEXON will calculate and claim the value of the rewards from SEPD each quarter before distribution to Suppliers and customers. Tariffs and rewards will be based on a common set of DUoS tariffs and DNO price signals and may involve demand reduction and/or demand shift.

**Method 5 – Community coaching:** This method represents an alternative approach to engagement and will be led by Neighbourhood Economics Ltd (NEL) an organisation specialising in local community engagement and behaviour change. As for Methods 1-4, Neighbourhood Economics will use consumption data to target their approach to achieving network benefits. This method seeks to:

- 'embed' a Community Energy Coach within an agreed target community providing a dedicated and consistent local presence
- work with all local stakeholders and partners to 'build' the capacity to embrace change in energy consumption; and
- draw on the support of all stakeholders and partners in mobilising and integrating

## Low Carbon Networks Fund

### Full Submission Pro-forma

### Project Description continued

grassroots effort to cultivate enterprise opportunities which will generate income to 'sustain' and further develop the positive behaviour change which the programme has served to trigger

In this case there will be no recruitment or data linked to specific customers. Instead monitoring will take place at the substation level and results in terms of overall reductions in usage will be assessed and compared through the network modelling. Control substation areas will also be monitored for comparison. Based on advance profiling, NEL will identify and select 2 differentiated communities of up to 1000 properties in each:

- one relatively affluent and aspirational, being seen as an attractive place to live with a relatively high quality of life allowing greater local engagement in choices regarding sustainability; and
- one relatively disadvantaged and increasingly susceptible to adverse effects in the local economy, many within the community being disaffected and potentially harder-to-engage on sustainability issues. Although hard-to-engage they have the potential to have a significant impact for customers as small energy changes have a bigger impact if the customers have less disposable income and are in fuel poverty

#### **2.4 – Changes since Initial Screening Process (ISP)**

The following changes have been made since the ISP:

- properties targeted by ECO and/or Green Deal are at the initial stages of such initiatives and are likely to be centred on local authority properties and would give biased results. Hence they are not targeted during the period of the SAVE project. Nevertheless, the results within our project will inform such schemes through sharing of learning, approaches and appropriate data in energy efficiency measures and interventions
- given the time and budget constraints it is impractical to achieve a statistically valid sample of SMEs, therefore we have decided to drop this element and look to do this work outside of this project. As a result of these changes the following partners and external collaborators are no longer involved: PassivSystems, Honeywell Control Systems, 22nd CE, Opower, Campaign Agenda
- we initially planned for the project to run from January 2014 to March 2017, however after evaluation of other LCNF projects (notably the recruitment challenges in CLNR) it has been decided to extend the duration until June 2018 to allow sufficient engagement time
- in the ISP £5.5m of LCN Funding was required, however as the bid has developed (namely the size of samples to achieve statistical validity) the cost of the project has increased, and as a result £9,975k of LCN Funding is now requested;
- during the workshops we decided to tender for the following roles within the project to enhance value for money: Supply and roll out of LED lighting; The University of Southampton Customer Engagement work; substation monitoring for the Community Coaching trial

## Low Carbon Networks Fund

### Full Submission Pro-forma

### Section 3: Project Business Case

This section should be between 3 and 6 pages.

#### 3.1 SEPD Context

The SAVE project is proposed by SEPD, the licence holder for the network of which Scottish and Southern Energy Power Distribution (SSEPD) are the holding company. SSEPD is part of the Scottish and Southern Energy (SSE) Group.

In its 2012 Annual Report, SSE states that priority for energy networks is: "Delivering upgraded electricity transmission networks and operational efficiency and innovation in electricity and gas distribution networks as they respond to the decarbonisation and decentralisation of energy." The learning from the Low Carbon Network Fund projects such as the SAVE project continue to inform our strategy to deliver on priorities with an aim to support our core purpose which is to provide the energy people need in a reliable and sustainable way.

#### 3.2 How the SAVE project reflects SSE's Values

As with all our projects, the SAVE project will reflect our SSE SET values:

- **Safety:** remains our number one objective and developing the SAVE project's safety assessments will be at the centre of the process to ensure the project does not pose a threat to the safety of our customers, our employees or our suppliers
- **Service:** we believe that the SAVE project will further enhance our understanding of customer behaviour and enable us to learn what options we can offer customers which will best meet their needs and enable them to make individual savings and reduce network costs
- **Efficiency:** we feel the time is right to trial how energy efficiency measures can be used as a cost effective tool for DNOs
- **Sustainability:** The returns on the SAVE project, both environmentally and financially are long term. By investing in the SAVE project now SSE aims to develop new practices which will provide the network designers of the future with a new range of enduring network management solutions
- **Excellence:** by proposing new solutions to the energy sector and to the UK, the SAVE project will produce a network model, consistent with our focus on bringing new ideas to Business as Usual (BAU)
- **Team working:** the SAVE project has brought together a team of industry experts, business, academia, business and public sector stakeholders to work alongside SEPD. The team has a common goal to work towards cost effective solutions for the low carbon agenda.

#### 3.3 Integration into SSEPD's Business Plan

SSEPD does not believe in carrying Research and Development for the sake of it. SSEPD's pragmatic approach to R&D and innovation ensures that the outputs of all projects are practical and effective. All R&D and innovation projects are regularly benchmarked and evaluated against the Business Innovation Matrix (Red, Amber and Green system) and each solution given a timeline to be taken up, or not, by the Business as Usual team.

Until now DNOs have not trialled energy efficiency at scale within the customers' premises.

## Low Carbon Networks Fund

### Full Submission Pro-forma

### Project Business Case continued

Traditionally DNOs have regarded this as outside their area of influence but in August 2012 the Smart Grid Forum Workstream 6 report highlighted that electricity demand reduction could serve to reduce the need for network reinforcement. Following the consultation from Ofgem dated 7th December 2012 entitled 'Low Carbon Networks Fund – Electricity Demand', SEPD became interested in potentially trialling such demand reduction. At present this is untested and therefore cannot be used at Business As Usual (BAU). Through these trials, SEPD hopes to quantify the most cost effective approach to having a measurable change in the operation of the distribution system and develop means of controlling the demand reduction in order to be able to rely on the demand reduction and defer or avoid network reinforcement.

The SAVE project has been designed to act as a template for replication across SSEPD's distribution networks and those of other GB DNOs. To this end we will utilise the dedicated Power Distribution Future Networks team. Within the Future Networks team is a dedicated Delivery Team supported by a dedicated Knowledge Manager whose role is to ensure that learning from each of our projects is incorporated into overall knowledge and business as usual as quickly as possible.

#### **3.4 SEPD's Challenges**

SEPD is facing 3 distinct challenges which have prompted this project:

**1) Localised Network Capacity:**

SEPD recognises that local electricity substations will face new challenges. Given the scale and nature of the investment required to address these load issues, SEPD is keen to seek alternative and potentially less costly methods to negate or defer the need for this investment

**2) Stakeholder Engagement:**

The requirement for SEPD to engage more fully with its customers and stakeholders in the design and delivery of its business plans

**3) Social Obligation:**

SEPD are keen to continue building on our ability to identify synergies between the needs of our customers and the needs of the network, which aligns with the recommendations made in Ofgem's 'Strategy Decision for the RIIO- ED1 electricity distribution price control - Outputs, incentives and innovation' (Supplementary Annex to the RIIO-ED1 overview paper, March 2013). Ofgem's recommendations include DNOs identifying and delivering solutions that might reduce demand on the network, such as energy efficiency measures

SEPD's challenge is how to respond to this 'major cultural and behavioural shift' to ensure that creative stakeholder engagement forms part of a strategic response to the opportunities presented and is embedded at all levels within the organisation. Confronting this challenge successfully could set SEPD apart as a market leader.



# Low Carbon Networks Fund Full Submission Pro-forma Project Business Case continued

## 3.5 The SAVE Project Business Case

### 3.5.1 Consistency with SSEPD's Future Business Plan

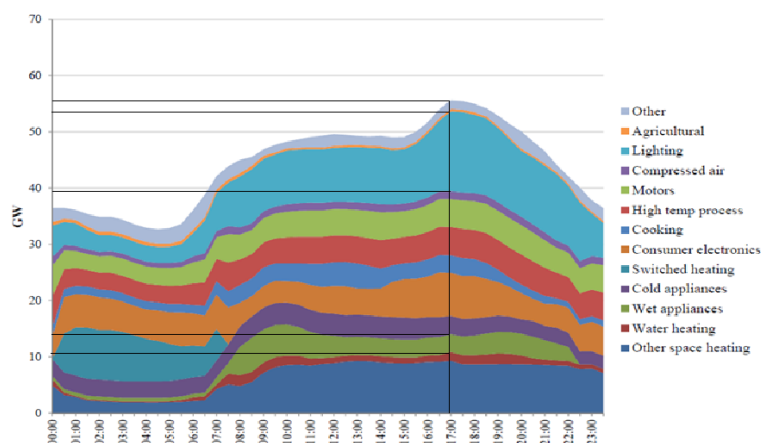
To support the SAVE project business case we refer to the recently completed SEPD's feasibility study project ref no IFI 2013\_01 Community Energy Coaching (Appendix M): "changes in localised consumption behaviours generally - and in terms of energy demand reduction in particular - are more likely to be achieved with key local and national stakeholders working intensively together to resource and empower defined geographical communities in actively embracing a compelling, locally relevant, collaborative sustainability-related theme. Furthermore, resultant positive behaviour change is more likely to be reinforced and sustained in the long-term by the momentum of pooled stakeholder effort."

The SAVE project will test the above statement and also develop the hypothesis further. Moreover, SSEPD's future Business Plan references the Community Energy Coaching approach ('Making Innovation Happen' paper) and also underpins the core proposition of this project and SEPD's aspiration that:

- from a purely technical perspective - such an approach could deliver sustainable reduction in demand for electricity, particularly in communities where loads are at or close to the limit of network capacity, negating or deferring reinforcement
- from the wider operational perspective - that SEPD, its stakeholders and partners could anticipate other significant benefits arising from such intensive local collaboration notably in terms of improved strategic effectiveness and operational efficiencies in respect of carbon reduction and the broader sustainability agenda

### 3.5.2 Benefits case for Network Operator

The University of Bath have developed a business case, drawing upon the Sustainability First report detailing GB demand broken down by appliances at peak demand periods (GB Electricity Demand – 2010 and 2025. Initial Brattle Electricity Demand-Side Model). The graph below indicates the breakdown of GB demand on January weekdays in 2010:



## Low Carbon Networks Fund

### Full Submission Pro-forma

### Project Business Case continued

From the graph the two demand groups that are most likely to be of use to DNOs are lighting and white goods/consumer electronics, therefore the SAVE project will concentrate on evaluating these two demand groups. This is also confirmed by the Intertek Report R66141 'Household Electricity Survey: A study of domestic electrical product usage', which revealed the structure of the average hourly load curve, as seen below:

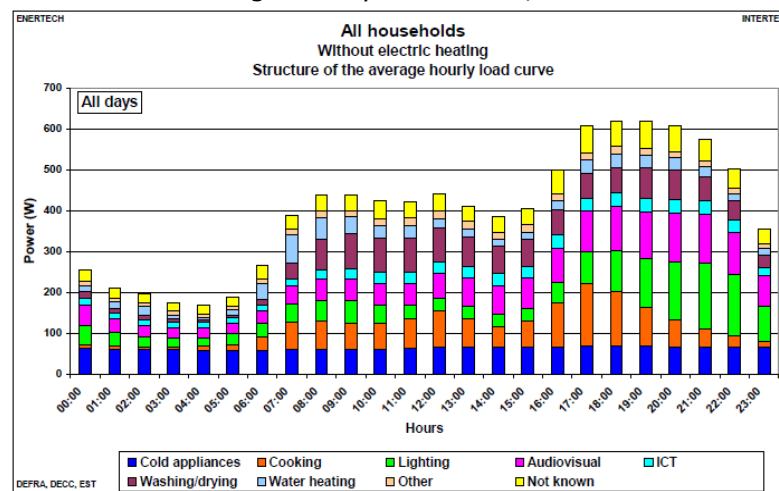


Table 1 Lighting demand at LV, HV and national peaks

	National Demand (GW)	HV Demand (GW)	LV Demand (GW)
Lighting (National)	4.49	6.41	7.49
Solent	0.04	0.06	0.07

Looking at lighting, table 1 shows the level of domestic demand at national peaks. If the traditional bulbs are replaced by the LED lights, which lead to 70% energy saving, the new system peaks with efficiency interventions for GB are shown in Table 2, and for the Solent is shown in Table 3.

Table 2 New system peak from LED interventions (GB)

	National Demand (GW)	HV Demand (GW)	LV Demand (GW)
Lighting	1.35	1.92	2.25
Peak Reduction	3.14	4.49	5.24

Table 3 New system peak from LED interventions (Solent)

	National Demand (GW)	HV Demand (GW)	LV Demand (GW)
Lighting	0.012	0.017	0.020
Peak Reduction	0.028	0.040	0.047

# Low Carbon Networks Fund Full Submission Pro-forma

Project Business Case continued

From their study on the cost of following DECC's 2050 Alpha pathways, the cost of additional capacity for HV and LV are £151,339 (£/MW) and £320,243 (£/MW) respectively, with the network cost savings from demand reduction as a result of LED interventions shown below in Table 4.

Table 4 Network benefits from introducing LEDs to GB and Solent domestic dwellings.

	GB Wide LED Intervention	Solent wide LED Intervention
HV reinforcement £151,339 (£/MW)	£679m	£6m
LV reinforcement £320,243 (£/MW)	£1.68bn	£15m
Total	£2.3bn	£21m

For the University of Bath's full analysis please refer to Appendix N.

## 3.5.3 Anticipated Benefits of the SAVE Project

The anticipated benefits of the SAVE project include:

- reductions in load pressures both at peak times and more generally over time allowing investment in network upgrades to be negated or deferred
- potential to inform SEPD's business planning and investment portfolio through closer working relationships with a range of key stakeholders by for example ensuring prior knowledge and consultation on key stakeholder investment and business development proposals and their potential impact upon SEPD
- improved partnerships with a wide range of stakeholders to both benefit from, and provide support for, other partners to deliver on their broader agendas
- the opportunity, based on the research conducted, to trial a range of different engagement and behaviour change approaches
- the opportunity to sustain the impact of this work beyond the initial funded period by securing the on-going support of key stakeholders within the target communities and to support its roll out across a wider area, whilst securing some financial return on investment through direct energy savings and potential investment opportunities

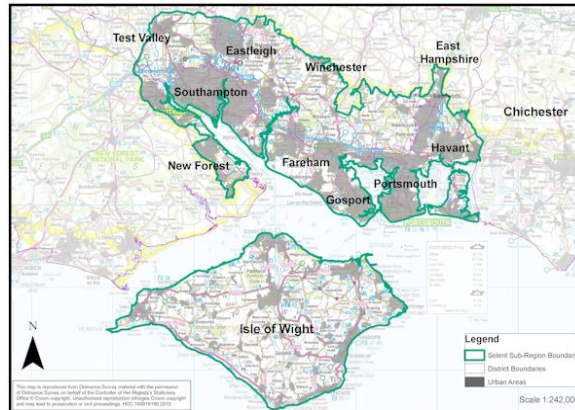
## 3.6 Other Supporting information for the SAVE Project

### 3.6.1 Why the Solent?

The Solent has become a key economic hub anchored around Portsmouth, Southampton and the Isle of Wight, with a population of more than 1.3million and over 50,000 businesses. Research across the Solent on the local carbon economy estimated that the area supports ~1,300 businesses and ~15,200 jobs in the environmental technologies industry. The growth observed in the green economy provides an opportunity for the Solent to take advantage of its strengths in advanced engineering and marine, strong business networks and high university involvement and interests.

# Low Carbon Networks Fund Full Submission Pro-forma

Project Business Case continued



The Solent region has a strong pool of skilled workers, with world class R&D within the universities of Portsmouth and Southampton and the wider Solent LEP area. The Solent LEP aims to create an environment better able to drive economic growth and private sector investment, focusing on five priorities: Enterprise, Infrastructure, Inward investment, Skills for growth and Strategic sectors.

With high growth rates for the green sector, the Solent region will reach critical barriers in infrastructure, thus constraining growth and the development. For the Solent region to become a national leader in low carbon initiatives it requires a long term, reliable infrastructure framework to support the changing usage of the network and equally it will demonstrate the Solent's suitability for business location and security.

## 3.7 In Summary:

The business case for the SAVE project can be summarised in five parts:

- Firstly, this project has the potential to reduce capital investment requirements for network operators consistent with the objectives of RIIO ED1 that will be beneficial to customers
- Secondly it will inform how stakeholder and customer engagement can support SSEPD's future business plans, notably in creating win-win, collaborative bottom-line solutions and allowing for more effective planned investment to develop local capacity
- Thirdly, facilitate the connection of more low carbon technologies, such as EVs and heat pumps, and subsequently develop a cost effective network model for use by SSEPD and the other GB DNOs
- Fourthly, working closer with stakeholders and communities will serve to explore and develop potential commercial and development solutions to sustain bottom line benefits to DNOs and other stakeholders
- Fifthly, the most challenging part of replacing distribution assets is at the low voltage level, with the upheaval and cost of replacing high and low voltage plant. The replacement value for the renewal of these assets, in SEPD and SHEPD's (Scottish Hydro Electric Power Distribution) license areas would be in the region of £3 billion. Therefore we urgently need to consider such measures as the SAVE project proposes and failure to take action now would result in major disruption and costs to the DNO's, stakeholders and customers

## Low Carbon Networks Fund

### Full Submission Pro-forma

#### Section 4: Evaluation Criteria

This section should be between 8 and 10 pages.

##### **(a) Accelerates the development of a low carbon energy sector & has the potential to deliver net financial benefits to future and/or existing Customers**

The Carbon Plan states that in order to meet government targets by 2050 all buildings will need to have an emissions footprint of close to zero and will need to become better insulated, use more energy-efficient products and obtain their heating from low carbon sources. In addition to being better insulated, the Carbon Plan states that buildings will need to make use of Smart Meters and heating controls, more efficient lighting and appliances and reduce their demand for energy. In this project SEPD will very actively facilitate these aspects of the Carbon Plan in a manner that produces direct network benefits and financial benefits to customers. The project has the potential to deliver net financial benefits to customers as local customers who adopt energy efficiency measures will save through reduced bills, whilst customers across the relevant network licence area would save through reduced DUoS charges if reinforcement costs are successfully reduced.

This project will work with the local stakeholders and will demonstrate the role a DNO can take in systematically and focussed encouraging uptake of energy efficient products and influencing behaviour. It will also show how residential buildings can be both the cause and the solution for DNOs. By evaluating and quantifying the benefits of energy efficiency measures to DNOs, the project will deliver a framework for the industry to contribute to the implementation of the Carbon Plan.

DECC believes there is significant potential for greater electrical efficiency in the UK – up to 32 terawatt hours or around 9% of total demand in 2030. In Government Response to the Consultation on options to reduce electricity demand, DECC calculated that a 9% reduction in overall demand could deliver, in 2030:

- Savings of around £2.3 billion
- Emissions' cuts in the traded sector by 3.2 mega tonnes (equivalent to the amount produced from electricity use of around 1.8 million households in a year)
- Electricity savings equivalent to that generated by around four power stations in a year

The SAVE project will provide SEPD with an opportunity to examine the role a DNO can play in facilitating these savings as a by-product of managing peak loads on the network.

Project participants such as Future Solent and the University of Southampton are already deeply engaged in facilitating the development of a low carbon energy sector through their own work. By participating in this project they will further demonstrate how collaborative working with electricity networks can enhance this development. Examples of these include the University of Southampton's £6.2 million project on "Liveable Cities" which aim to quantify the UK's legally required emissions in cities by 2050, by assessing resources flows for cities (encompassing buildings, transport, etc.) economics, acceptability and the impact on the current energy supply. These studies currently target Southampton, Portsmouth and Solent LEP with direct involvement by Local Authorities through the investigation and monitoring of their building stock and opportunities for energy efficiency and local CHP generation. Partner Local Authorities have plans for ECO/Green Deal schemes of around £100 Million investments in the sub-region over the next 3 - 5 years, targeting energy efficiency measures and their impacts on supply and emissions in the region.

## Low Carbon Networks Fund

### Full Submission Pro-forma

### Evaluation Criteria continued

The green economy is emerging out of the need to meet international and domestic carbon targets. In order to meet the ambitious government target of an 80% reduction in CO<sub>2</sub> emissions by 2050, many areas of the UK economy will experience growth opportunities in the green economy. Energy efficiency can create jobs in the Solent and by creating visibility of the impact of energy efficiency measures on DNOs, the SAVE project will assist in this growth. The South Hampshire region has a workforce of 434,500 and already 11,000 of these workers are employed in the green economy in businesses trading in both environmental technology and services. The Community Energy Coach trial offers a jobs creation model for the smart energy sector. The SAVE project will provide valuable learning on the cost of such an approach and the impact on the distribution network which could lead to a cost/benefit analysis of a national Community Energy Coach programme.

The trials will focus on how buildings can be the solution enabling both base load and peak load reduction, focusing on the approach a DNO could utilise to reduce both in the required time to avoid a defined level of investment. This approach will lead to benefits for both the DNO and its customers. Ofgem has been calculated that a 5% reduction in energy use at peak will result in energy market cost reductions of £219m per annum, some of which would benefit to customers in the form of lower energy bills. At the same time the same 5% reduction at peak will result in infrastructure cost savings of between £143m and £275m. This directly correlates to savings for the customer. These benefits could also be passed on to customers through lower socialisation costs of network reinforcement. However, we anticipate that through the projects highlighted above, enhanced reduction can be achieved that will allow the DNO to validate further its business and infrastructure investment models.

The Energy Saving Trust estimates that lighting makes up roughly 8% of a household energy cost. The SAVE project will examine how effectively DNOs can encourage the uptake of LED lighting to reduce this percentage. The findings from the SAVE project can feed in to DECC to examine if there could be a role for DNOs in future schemes that drives the uptake of both energy efficiency measures and behaviours.

Extensive reviews of Smart Meter and Smart Grid projects globally has found clear evidence that technology alone does not produce the most consistent, sustainable route to permanent energy efficiency but that a combination of technology and customer engagement has proven successful. SEPD is very keen to understand what approach will lead to be most significant load reduction at the lowest cost and it is with this in mind that the trials have been designed.

#### **(b) Provides value for money to distribution Customers**

This project will demonstrate how DNOs can use energy efficiency measures to address future network planning challenges and the technical and commercial arrangements available to select the optimum means to meet new demands. Real experience of Energy Efficiency will be gained through the trials enabling DNOs to accurately select the most effective measures.

The project will generate directly related measurable changes in the operation of the Distribution System including:

- deployable list of energy efficiency measures
- cost modelling and business cases for deployment of these different measures



## Low Carbon Networks Fund

### Full Submission Pro-forma

### Evaluation Criteria continued

- customer profiling - will leverage existing LCNF project learning
- support from the Energy Suppliers

This project will highlight potential barriers and also propose changes to existing operational documents, e.g. the Distribution Code of Practice and Planning Manual. This would change the way all GB distribution networks are planned and operated.

Energy efficiency measures will reduce utilisation of the low voltage network, allowing for an increased headroom which could allow further load to be added. This would improve utilisation by facilitating new connections or uptake of low carbon technologies such as EVs and heat pumps.

To enhance value for money we plan to undertake an open and competitive procurement process for the supply and roll out of LED lighting to the properties that will form the LED installation group, as well as the trial survey and recruitment work as advised by UoS.

A competitive procurement process has not been undertaken for the other partners as it is felt that their offerings (such as Maingate), in-kind contributions and UK and international experience negate the need to tender for the services or items they will provide.

A great deal of thought has been given to how to construct this project in the most cost effective manner. The focus of the project is determining the most cost effective manner to achieve DNO-led energy efficiency and therefore the project approach has to be cost effective. SEPD approached the University of Winchester School of Media and Film instead of a media agency to develop cost effective engagement material for the customer engagement campaigns to deliver value for money for distribution customers. The DNO also recognised that the act of involving hundreds of student in making the engagement material is in itself a form of DNO engagement deepening the value for money. The university is already focused on energy efficiency and has recently added to its building stock with award winning energy efficient buildings. SEPD anticipates that their involvement in the project will lead to establishment of relationships on an on going basis in the BAU business.

#### **(c) Generates knowledge that can be shared amongst all DNOs**

The University of Southampton has provided insight into the ideal size of trial group sizes to be recruited to ensure that the project will generate results that are statistically significant to ensure that the learning from this project can be shared amongst all DNOs. The rate of receptiveness and uptake forms a useful part of the project learning. In designing this project SEPD has learnt from previous LCNF projects and the challenges faced by those projects in recruiting customers to trials. Sufficient time will be allocated and a professional MRS-accredited agency will be utilised for the customer recruitment approach with trials only commencing in the second year. This approach has been designed to ensure that the learning from the project will be valid to all DNOs.

The project will provide new knowledge on the effectiveness and relative value of energy efficiency measures for DNOs. We have identified a range of knowledge gaps which need to be addressed in order for DNOs to understand and exploit the potential benefits of the methods which will be trialled:

- What engagement approaches are available to DNOs to facilitate uptake of energy

## Low Carbon Networks Fund

### Full Submission Pro-forma

### Evaluation Criteria continued

efficiency measures by domestic customers?

- What do a DNO led energy efficiency campaigns look like and how can they be run successfully?
- What are the most cost effective energy efficiency measures for DNOs?
- How enduring are the impacts of each measure and what costs if any are associated with sustaining the impacts?
- What is the value of local stakeholder engagement to DNOs in developing/using energy efficiency measures and how can it be used in the network investment tool?
- Can energy efficiency make an effective and economic contribution to network management?
- What is the potential for peak demand reduction and overall demand reduction achieved through energy efficiency measures to off-set the need for traditional network reinforcement?
- What changes are required to industry governance and documentation to facilitate an energy efficiency modelling-based approach to network management?

Learning objectives will be refined during the early stages of the project to take account of the most recent knowledge available and insights from stakeholder consultation to understand groups' specific knowledge needs. This will ensure the project generates learning that is robust, relevant and timely. We will engage with existing LCNF projects and projects from outside the UK to ensure all learning is collected and extracted from the project. The knowledge will be shared via a professionally planned and managed learning and communication strategy which includes dissemination via a range of media (online resources, publications, conferences, seminars and mentoring). Whilst aimed at DNOs, the dissemination of knowledge will be helpful to customers, energy suppliers and policy makers/regulators. It will also have cross-sector relevance – for example, gas distribution network licensees are also likely to be interested in learning about how a network operator can engage with its customers and promote energy efficient behaviour change. .

#### **(d) Involvement of other partners and external funding**

##### **Project Partners**

Our partners were chosen for a number of reasons including their knowledge and expertise in energy efficiency measures, Customer Engagement, Sustainability Credentials and their passion for thinking for new and innovative solutions.

During the time period between the 2013 ISP result and making our full submission we have held a series of workshops and reviews with our potential partners and product suppliers. As a result of these workshops we have re-focused some of the project and our partners' roles and responsibilities and also strengthened the team with the addition of University of Bath to support the Network Monitoring area.

As per our previous LCNF projects we are encouraging a different approach with partners and product suppliers, each have chosen because of their experience in particular areas such as the energy efficiency not only in the UK but across the world where energy efficiency is already being used by Network Operators. The SAVE project partners have worked with us all through the Initial Screening Process and now through to the main bid submission. The experience they bring to the project will be critical, we believe, to the success of the SAVE project and successfully tackling future low carbon challenges.

## Low Carbon Networks Fund

### Full Submission Pro-forma

### Evaluation Criteria continued

The main project collaborators and their roles are detailed below, more information can be found in the Partner Information section in Appendix O. 'Gross costs' refers to the total costs expected to be incurred by each partner during the project, 'Contribution' is the portion of these costs the partner will cover from their own resources:

**ELEXON** (Gross costs £X; Contribution £X via ELEXON, £X via Suppliers)

– will be responsible for Supplier engagement, settlement processes and validation of data (Method 4). They will work with the Energy Suppliers and SEPD to support the facilitation of a new DNO pricing signals and how those signals may be settled across the industry, ELEXON will evaluate how a new energy efficiency RII regulatory incentive mechanism could operate.

**DNV KEMA** (Gross costs £X; Contribution £X) - will be responsible for management and evaluation of the trials (Methods 1-3) and campaigns, along with providing project assurance.

**University of Southampton** (Gross costs £X; Contribution £X) - will be responsible for designing and setting up the statistical valid samples groups in the Solent, statistical modelling, analysis and profiling of customer behaviours to produce the Customer Engagement model.

**Maingate** (Gross costs £X; Contribution £X) - will be responsible for providing a local centre for data, a system to aggregate data from across the project (customer, grid, buildings, renewables, etc); customer engagement and supply of smart home devices for households in Methods 1-3. Produce reports and extractions for both statistical analysis and operations.

**University of Bath** (Gross costs £X; Contribution £X) – will be responsible for developing of the network model for the project, working closely with the team at UoS and the customer engagement model work.

**Future Solent and the local Councils** – will provide support and input into the development of the trials, access to stakeholders and assistance with learning dissemination.

#### Project Suppliers

- Neighbourhood Economics – will be responsible for supporting and developing the Community Coaching trial in the project (Method 5). Utilising their experience in the previous IFI project
- University of Winchester – will be responsible for supporting the project with energy efficiency campaign materials and techniques, UoW now being considered as a support to the business as usual stakeholder engagement in SEPD
- CGI – will be responsible for providing access to smart meter data

## Low Carbon Networks Fund

### Full Submission Pro-forma

### Evaluation Criteria continued

#### **Project supporters:**

- SmartGridGB – support the project in a number of areas including customer engagement
- Partnership for Urban South Hampshire (PUSH)
- Hampshire Chamber of Commerce

Details on how the contracts will be structured are in Section 6 of this document.

ELEXON will adopt a “whole market” approach inviting all suppliers to participate in the project. They have secured commitment to provide enough smart meters to support the project from Southern Electric, British Gas, Flow Energy, Coop Energy and Ovo.

During the project workshop discussions we have decided to tender for the following activities within the project to enhance value for money:

- Supply and roll out of LED lighting to domestic customers
- The University of Southampton Customer Engagement work
- Substation monitoring for Community Coaching trial

We also decided that to achieve a statistically valid sample of SMEs would not be practical in the timeframe and budget constraints of the SAVE project therefore we decided to drop this activity and look to do this work outside this project.

#### **(e) Relevance and timing**

We feel the time is now right to carry out a project to validate the effectiveness and value of energy efficiency measures as another tool available for DNOs to manage their networks in the future.

While it is expected that predicted fuel cost increases will mean that energy efficiency will start to drive itself, rate of uptake and the level of impact on electricity networks are still significant unknowns. It is therefore difficult to justify any avoided capital expenditure on the basis of expected energy efficiency savings during the RIIO-ED1 period. Understanding the results of real action on the ground to reduce consumption is required to enable GB to avoid the risk of in millions being spent reinforcing networks that could ultimately be made redundant. This project is needed to show the extent to which DNO actions to encourage adoption of energy efficiency measures in targeted areas can both accelerate energy efficiency and avoid significant network investment to the benefit of all stakeholders.

The timing of the project means that it will be possible during RIIO-ED1 for DNOs and Ofgem to gain an understanding of the potential for DNO-led energy efficiency measures to avoid the need for reinforcement, and the variation in impacts which could be expected in different areas according to customer types. It will also provide policy makers and regulators with understanding of what changes to the current regulatory and policy landscape may be required for wider roll out of these measures. This learning will be available by mid 2018, giving time for assimilation by relevant parties and further investigation of outstanding issues if required to inform incorporation into the early stages of planning for development of RIIO-ED2. For example, relevant working groups could use lessons from SAVE to consider introduction of an energy efficiency related incentive through RIIO-ED2 and inform an effective design.

## **Low Carbon Networks Fund Full Submission Pro-forma Evaluation Criteria continued**

The project will be able to draw upon and complement the existing initiatives and successes of the local stakeholders' activities to boost the uptake of energy efficiency measures. This approach will maximise the opportunities for SMEs to participate in the growing renewable and low carbon sector by opening up supply chain opportunities.

The project is conducting research at the right time when there is much anticipated change to how the network will operate, such as heat networks and heat pumps, CHP, electrification of rail, increase in rail freight, EVs, storage technologies, offshore wind and marine renewables. By understanding what role energy efficiency can play in supporting a reliable and flexible network, and delivering the actions that will realise that efficiency, then the DNO can in its own way support innovation by others to benefit customers.

# Low Carbon Networks Fund

## Full Submission Pro-forma

### Section 5: Knowledge dissemination

This section should be between 3 and 5 pages.

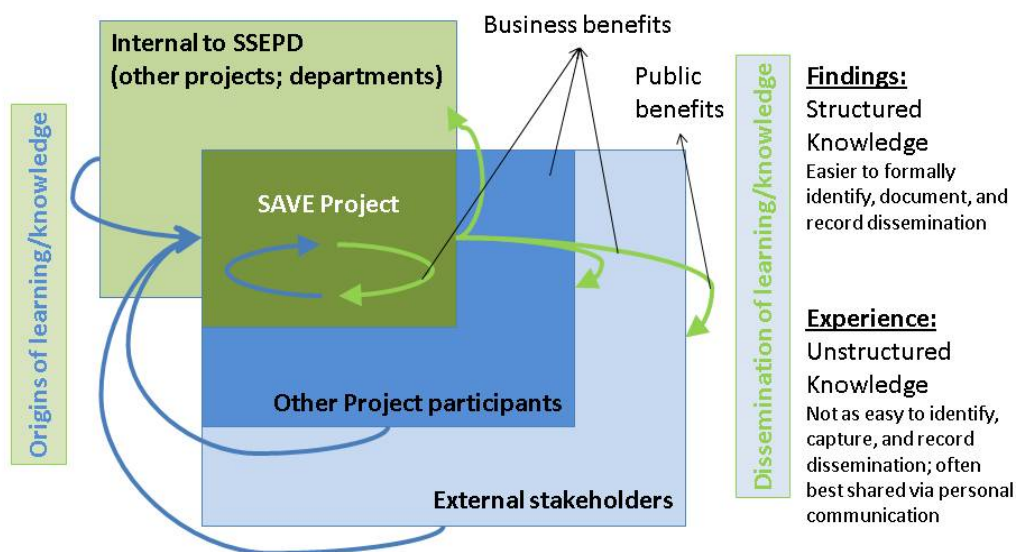
☐ Please cross the box if the Network Licensee does not intend to conform to the default IPR requirements.

#### 5.1 Introduction

Effectively capturing and disseminating learning, both internally and externally, is a critical aspect of innovation projects undertaken by SEPD. In order to achieve this in innovation projects, we adopt clear learning objectives supported by established knowledge management principles and procedures, common to SSEPD.

Our approach builds on the approach used for previous LCNF projects and SEPD's own experience from past projects, including SSET203 New Thames Valley Vision (NTVV) and SSET205 I<sup>2</sup>EV (My Electric Avenue), which has improved our understanding of how learning and/or knowledge is generated from DNO R&D projects and can be most effectively disseminated.

The diagram below provides an overview of the types and sources of knowledge which will be generated, used and shared through the project.



The project will recruit a dedicated Communications & Outputs Manager who will work with all partners to ensure structured and unstructured learning is identified, and appropriately documented. This is essential for effective dissemination and integration activities tailored to specific audiences, through channels appropriate for each audience. The Communications and Outputs Manager will facilitate:

- Learning dissemination: sharing the knowledge generated by the SAVE project as an ongoing project activity
- Integration activities: these activities are aimed at enabling the practical application of knowledge generated by the SAVE project by stakeholders, including customers, industry participants, academia, and DECC/Ofgem



## Low Carbon Networks Fund

### Full Submission Pro-forma

### Knowledge dissemination continued

The following subsections describe our knowledge management and dissemination process in detail and identifies the detailed dissemination and integration activities we propose to undertake.

#### **5.2 Formalising Learning Objectives for the SAVE project**

The starting point is to formalise the project's anticipated key learning objectives to understand the structured knowledge the trials will generate and what is required to effectively capture, manage, and share the outputs.

The trials in the SAVE project are designed to provide insight into the cost effectiveness of a variety of measures that can be introduced by DNOs to encourage more energy efficient behaviour by customers. The trials will also generate learning on how different types of measures can be designed and implemented. Taken together, the outcome of the trials will be used to increase DNOs' – and energy supply chain stakeholders' – understanding of how energy efficiency measures can be used as an alternative to network reinforcements, as well as the costs and requirements associated with investing in different energy efficiency measures.

The learning objectives for the trials conducted in the project are:

- to gain insight into the drivers of energy efficient behavior for specific types of customers
- to identify the most effective channels to engage with different types of customers
- to gauge the effectiveness of different measures in eliciting energy efficient behaviour with customers
- to determine the merits of DNOs interacting with customers on energy efficiency measures as opposed to suppliers or other parties

#### **5.3 Reapplication of experience**

The project will build on previous research, including findings from LCNF projects related to customer engagement, customer categorisation/demand profiling and Time of Use tariffs. Literature reviews plus stakeholder consultation are part of the early phase of the project. This principle will ensure the SAVE project generates new learning; where necessary, learning objectives may be refined to ensure the project builds on current knowledge and does not replicate any emerging work.

#### **5.4 Continual learning capture**

Structured learning – tangible data or findings relating to the learning objectives above – will be generated by the trials. Project participants will dedicate resources to trial design, data monitoring, interpretation, refinement of trial design and reporting of findings. Unstructured learning including lessons learned and 'how to' knowledge will be captured through reflection on the process of project delivery. The project team will schedule and carry out lessons learned reviews at the end of defined activities and phases. Findings from lessons learned reviews will be validated by the Project Review Board and disseminated to

## Low Carbon Networks Fund

### Full Submission Pro-forma

### Knowledge dissemination continued

relevant groups as set out below.

In addition regular SAVE project meetings will include a 'Learning Moment' dedicating time to identify recent learning, from the project and/or observation of external developments. A learning log will be maintained to capture lessons learned on an ad-hoc basis, including new insights from learning moments.

#### 5.5 Targeted Dissemination & Integration Activities

We recognise that different groups will have different interests in the learning generated by SAVE and that dissemination is most effective when the messages and methods are tailored to the audiences' needs. For instance, while social media might be an effective way of reaching out to customers and the academic community, this would work less well for industry participants (DNOs, suppliers, Ofgem, DECC). Similarly, the type of publications and coverage provided will differ between customers, the academic community, and industry participants.

Our dissemination will focus on the following groups, using the methods outlined in the table below. Where appropriate, we will integrate our dissemination with established channels for sharing LCNF project learning to maximise efficiency and enable cross-project insight, such as the use of the ENA portal.

Audience	Dissemination Activities			Integration Activities
Customers	SAVE website	General publications/magazines/ brochures/social media	Community events	
Industry participants	SAVE website/ periodic project reports/ENA portal	Industry publications/magazines	Conferences/ industry stakeholder events	Training materials/ workshops/ new commercial models
Academics	SAVE website/ periodic project reports	Academic publications/magazines/ social media	Conferences/ academic events	Course materials/ guest lectures/ Trial data for research
Ofgem	SAVE website/ periodic project reports/ENA portal	Industry publications/magazines	Conferences/ industry stakeholder events	Training materials/ workshops/ incentive mechanisms
DECC	SAVE website/ periodic project reports/ENA portal	Industry publications/magazines	Conferences/ industry stakeholder events	Training materials/ workshops/ policy advice

#### Customers

Knowledge dissemination will enable trial participants and other GB customers to learn about their own energy consumption patterns, their impacts on distribution networks and how they can benefit from energy efficiency measures (at individual and collective levels). Dissemination activities targeted towards the 'community energy' sector will also be undertaken – engaging with these groups will promote wider spread of learning via grassroots networks.

## Low Carbon Networks Fund

### Full Submission Pro-forma

### Knowledge dissemination continued

**Industry participants - DNOs**

DNOs' primary interest will be in the impacts of energy efficiency measures and the methods by which they can implement the most cost effective measures. The network and customer models, and the processes for their development will be shared via publication of knowledge outputs and activities to enable DNO staff to integrate learning into their business practices (see below for further details).

**Industry participants – other stakeholders**

This group includes energy suppliers and other groups involved in the energy supply chain and its management. In particular, findings on the feasibility and impacts of delivering new commercial models within existing regulatory frameworks will be of value to the industry. Requirements defined for wider roll out of the trial methods will be highly relevant to technology suppliers and service providers. It also includes groups representing customer interests.

**Academics**

Customer engagement with their energy usage, and willingness/ability to shift and reduce energy demand is an area of research currently attracting significant interest. Findings on response to different methods of engagement will be shared with academic audiences via conferences, workshop series, peer-reviewed outputs and training.

**Ofgem and DECC**

Findings from the project will provide valuable new knowledge to inform development and implementation of policy in relation to the role of energy efficiency and potential for demand reduction. Dissemination to these groups will focus on the impacts of the tools trialled and barriers/opportunities encountered in project delivery.

**Events**

In addition to dissemination via the annual LCNF conference, we will disseminate findings through relevant academic and industry conferences. Small, focussed workshop series targeted to academics and industry specialists have proved a useful means of knowledge exchange which builds networks across stakeholder groups and promotes ongoing dialogue. Participation in industry forums will also be used.

**SAVE project website**

An appropriate format for online dissemination will be selected based on review of available tools. The website will be used to publish interim knowledge outputs including training materials as they are developed and build up a library of resources.

**Integration activities – training**

We consider the practical training of industry participants a core part of the dissemination and integration plan. Effective training ensures that the audience will simultaneously gain an understanding of the learning achieved and how to apply it in practice – key to successful business as usual roll out of measures proved cost effective through the project.

## Low Carbon Networks Fund

### Full Submission Pro-forma

#### Knowledge dissemination continued

We will use outputs from our NTVV project's training development package of work to inform selection of training methods to embed SAVE project outputs.

For energy industry participants integration activities will focus on the preparation of manuals, training materials, workshops and advice related to the development of new commercial models. We plan similar activities for Ofgem and DECC, to explore the possibility of developing energy policy changes and a formalised incentive framework under RIIO-ED2 aimed at energy efficiency, DSR or DR activities for DNOs.

For the academic community, integration would focus on the development of course materials and on making trial data available for further research – this is a further way in which the project will provide value for money.

#### **5.6 Intellectual Property Rights (IPR)**

It should be noted that we do not anticipate that any formal intellectual property rights will be created as a result of the SAVE project and so no specific provisions have been made in that regard.

The knowledge and learning generated will be in the form of 'know-how' and results from trials. These types of outputs are not anticipated to be appropriate for protection via registration or licensing and we plan to share all outputs required for other stakeholders, particularly DNOs, to use the learning gained effectively, in line with the aims of the default IPR arrangements.

# Low Carbon Networks Fund

## Full Submission Pro-forma

### Section 6: Project Readiness

This section should be between 5 and 8 pages.

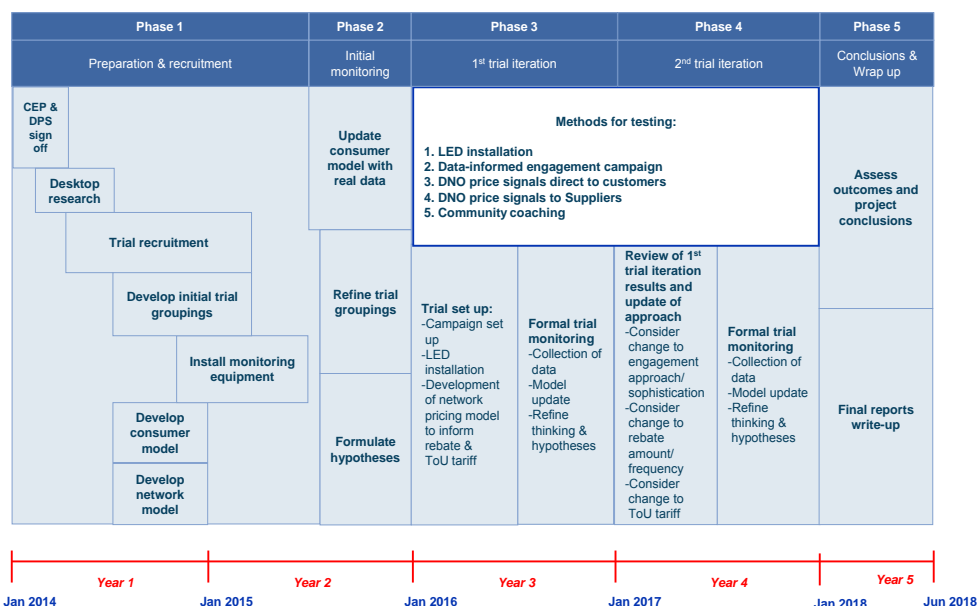
Requested level of protection require against cost over-runs (%):

Requested level of protection against Direct Benefits that they wish to apply for (%):

#### 6.1 Readiness introduction

The SAVE project has come about as a result of discussions with numerous organisations over several years. More recently this has crystallised into the SAVE project as it is now defined. The project consists of a number of discrete elements carried out over the life of the project. These are illustrated in the diagram below and are shown in more detail in Appendix B. As can be seen from this overview of the project the key elements to undertaken at the start of the project are the development of the customer and network models and the recruitment of participants.

Project phases and timing



For the model development the initial work is a review of existing research to provide a sound basis for the design of the model and ensure this is a learning continuum by drawing on the vast international and UK experience of our project partners from previous trials. There are no barriers to this work starting immediately. The second element is the recruitment of participants for the trials. Given that this requires customer interaction the first part of this is the production of customer engagement plan and data security strategy to be provided to Ofgem for approval. At a high level the customer interactions are understood and so the plan can be produced without delay based on our understanding of this project and our knowledge of previous customer engagement plans provided for other

## Low Carbon Networks Fund

### Full Submission Pro-forma

### Project Readiness continued

LCNF projects.

Given the technology and installation process of the monitoring equipment being used in the project is already tried and tested, the start of the trials is seen as low risk allowing the start of activities to be planned with certainty.

#### **6.2 Project Resources are Ready to Start**

The development of the project to date has been led by an experienced, disciplined team experienced in LCNF projects working with the project partners in the preparation of the bid. The core expertise within this team will continue into the SAVE project execution bringing continuity and focus on the objectives of the SAVE project. Therefore the work will start immediately upon project award with little need for an initial set up period. Following project approval, further appointments will be made to allow the team to move to delivery mode and all frameworks will be agreed and formalised with our partners. We will then proceed to deliver the project in line with the outline plan shown above and the detailed plan in Appendix B.

#### **6.3 Project Partners are Ready to be Engaged**

For the project partners Memoranda of Understandings (MoUs) and purchasing frameworks covering the activities within the SAVE project will be established before the start of the project. The procurement engagement is important to SEPD's bid as it facilitates work commencing without delay upon contract award.

SEPD will enter into Memoranda of Understanding with its key project partners (by 31<sup>st</sup> December 2013):

- University of Southampton
- Maingate
- Future Solent
- DNV KEMA
- ELEXON
- University of Bath

The Memoranda of Understanding and agreed framework agreement will provide information for the supply of products or services over a given time period. They are not in themselves contractual agreements to supply, but are enabling agreements providing agreed specifications, delivery terms, prices, and terms and conditions of contract. Framework agreements will be in place with all project partners upon contract award, allowing individual purchase orders to be placed against it under the agreed terms and conditions.

Although the framework agreements will not specify definite quantities of goods or services that will be ordered against it, indicative quantities will be provided before funding allocation. Framework agreements are normally used to set up general supply arrangements with a supplier (e.g. use of a supplier's catalogue), or to set up central supply arrangements for use by local operational areas.



## Low Carbon Networks Fund

### Full Submission Pro-forma

### Project Readiness continued

The project suppliers will work with a combination of a framework contract and a call off contract, as appropriate. Each agreement that will be put in place will be backed by individual work orders which formally outline the individual work packages, a process that supports the SAVE project.

#### **6.4 The SAVE Project will be Controlled Using Existing Methodology**

Management of the SAVE project will be conducted in accordance with SSEPD's Future Networks Programme Management Procedure (FNPMP) and its associated documentation, processes and templates. The manual has been based on the SSE Major Project Governance Framework Manual (MPGFM) which is in place to ensure the delivery of projects '...safely, on time and with the level of returns committed to...' and to assist in the delivery of £6.4bn of investment across the SSE Group over the period 2000-2013. The use of a tried and trusted methodology allows for an immediate start with confidence in the project management process.

A key element of the project governance is the development of a detailed project plan. The SAVE project is made up of a number of discrete elements brought together to provide the desired project outcomes. Each of these elements has been developed and planned with the people responsible for that part of the project, both from within SEPDP and the project partners and the whole brought together by the core project team. This allows independence and some degree of flexibility of each element operating within the overall project framework. This supports both a prompt start and reduces the risk as the project progresses.

In developing the plan we have taken cognisance of learning from our and our partners' involvement in other LCNF Tier 2 projects, to provide a plan that is realistic and will ensure that a prompt start can be made once approval of the SAVE project by Ofgem has been confirmed.

#### **6.5 How costs and benefits have been estimated**

##### **6.5.1 Project costs**

Gross - £13,197k; less External funding - £1,581k; less DNO funding - £1,224k; leaves a net funding requirement- £9,975k

The project costs have been provided by our project partners following the agreement of the project approach, deliverables and work packages. We have made reference to available public source information, international comparisons, and academic input to ensure these are robust.

Below is a breakdown of the key components of the SAVE project (gross costs are pre-bid submission but are inclusive of benefit in-kind contributions from our project partners):

## Low Carbon Networks Fund

### Full Submission Pro-forma

### Project Readiness continued

Work Package	Description	Cost
WP1	Project Management	£837,880
WP2	Customer Model Development, Data Analysis and Reporting	£1,232,860
WP3	Network Model Development	£771,450
WP4	Participant Recruitment, Trial Surveys, Field Trials and Trial Management	£1,775,910
WP5	Meter Data Gathering and Collation	£3,746,650
WP6	Knowledge Dissemination	£1,468,260
WP7	LED Trial	£378,070 (estimated tender value)
WP8	Smart Plug Trial	£22,350
WP9	ToU Tariffs Trial and DNO Rebate Trials	£1,608,100
WP10	Data-informed Engagement Trial	£587,460
WP11	Community Coaching Trial	£768,070

Total Cost of the Project is £13,197,070 (inc. Inflation)

#### 6.5.2 How the Costs and estimates have been estimated

The costs per work package are shown below in more detail. The cost of each task has been budgeted by estimating the days for SEPD and the project partners' time and materials, travel and accommodation required. The costs are correct at the time of the bid submission however will continue to develop as the project develops. All costs are shown in more detail on the main costing sheet which can be seen on Appendix A.  
All costs are in gross real terms.

A further breakdown of the main elements of costs per work package are shown below:

##### **Project Management - (Lead - SEPD)**

The costs for this work package includes all associated SEPD staff, including a full time Project Manager who will be supported by the South Delivery Manager.  
The labour rate associated with these tasks is SEPD standard labour rate of £X per day.

##### **Customer Model Development Data Analysis and Reporting - (Lead - University of Southampton)**

The costs for this work package are all involved with building an interactive web-mapping based tool using appropriate statistical and analytical GIS tools. The main output of the UoS work will be to build a model which will allow interrogations of scenarios and undertake simulations.

##### **Network Model Development - (Lead - University of Bath)**

The costs for this work package are involved with building the network modelling tool for the project. It is anticipated that the tool will be similar to the UoS tool that it will be a interactive web-based tool to allow UoB and project partners to run various network scenarios and simulations. This work will also be supported by existing network analysis by SEPD staff.

## Low Carbon Networks Fund

### Full Submission Pro-forma

### Project Readiness continued

**Participant Recruitment, Trial Surveys and Field Trials - (Lead – University of Southampton/ DNV KEMA – to be tendered)**

The costs for this work package are involved with the recruitment of customers. This recruitment element of this work package will be tendered and will be coordinated by UoS. The bulk of costs in this work package are in the use of an independent experienced MRS Market Research company who will lead our customer recruitment and on-engagement programme. This work package also includes the management of the trial model by DNV KEMA.

**Meter & Data Gathering, Collation, Central Data Repository - (Maingate, SEPD, ELEXON)**

The costs for this work package include provision for the installation of equipment and support services to allow gathering of customer data. The equipment includes smart meter (Energy Suppliers), the Data Hub and Optic Sensors (Maingate). The Suppliers have agreed to work with the project team to meet the timescales and also fund the smart meters installation – this work package will be managed by ELEXON on behalf of the project. The alternative method to the smart meters is the optic sensors – the costs include for the main data hub, optic sensors, installation of the smart plugs, delivery of equipment to the customer, on-going help desk and on the ground support for the installation and trial periods. This work will be supported by SEPD ICT and data staff.

**Knowledge Dissemination - (SEPD)**

The costs for this work package include provision for the various learning activities planned for the project. A major part of these costs are the funding of a SEPD member of staff to handle the outputs of the project and communication to all stakeholders. The workload associated with these tasks is ever increasing and as it so important to the development of the LCNF arena we will install a person to document and manage production of materials and activities required to disseminate the learning.

**LED Trial - (SEPD – to be tendered)**

This work package supports the main trials. Therefore the costs include provision for the specification of LED requirements, tendering for best solution and installing in trial zones.

**Smart Plug Trial - (Maingate/ SEPD)**

As above this work package supports the main trials. The costs includes provision for buying the equipment for the trials as the smart plugs will be installed with the main optic sensors to reduce the cost to the project.

**Time of Use Tariffs and DNO Rebates - (ELEXON)**

The costs associated with this work package include provision for ELEXON facilitating the Energy Suppliers and SEPD to introduction of new tariffs and incentives to the market place and evaluating the effects. These tasks will be supported by Commercial support from SEPD.

## Low Carbon Networks Fund

### Full Submission Pro-forma

### Project Readiness continued

**Campaigns - Engagement and Interventions - (DNV KEMA)**

The costs associated with this work package are involved with preparation, design, build and implement campaign materials to support the customer engagement and intervention trials. This work package will be managed by DNV KEMA who will be responsible for ensuring the campaigns are productive and add value to the other trials.

**Community Coaching - (Neighbourhood Economics/ SEPD)**

The costs for this work package include provision for evaluating the effect of a installing a community coach in the Solent area. The work includes for the initial evaluation of the Solent area for suitable study areas for the trial. The costs also include for installation of substation monitoring at appropriate locations within the Solent area. These tasks will be supported by Network Design support from SEPD.

**In Kind Contributions**

The costs to Maingate, ELEXON, University of Southampton, University of Bath and DNV KEMA were estimated by the respective companies. All partners have supplied a breakdown of costs and their in-kind contribution.

**6.5.2 Direct project benefits**

There are no Direct Benefits being claimed from the SAVE project.

**6.5.3 Measures to reduce cost over-runs or direct benefit shortfalls**

As stated above the SAVE project will be managed in accordance with SSEPD's Future Networks Programme Management Procedure, which has been based on the SSE Major Project Governance Framework Manual. The SSE MPGFM is a whole-lifecycle tool designed to ensure projects are governed, developed, approved and executed in a consistent and effective manner, with consideration of best practice in project delivery. As this project is utilising the procedure based on the SSE MGPFM it will ensure a rigour is employed to confirm the project is well controlled leading to a successful conclusion. Additionally the same successful management formulae used for the NTVV project will be extended to this project.

The governance framework is phased with three gates at appropriate decision points, with clear, consistent deliverables for each gate. Project governance rules are established and defined for each phase, with standard project organisational structures and key roles. As the SAVE project develops through the inception and opportunity assessment it is subjected to stage gate reviews. The initial reviews consider project readiness and the underlying needs case in order to allow the project to proceed, or if further re-working is required. Similarly, as the project enters the research and development and operate and evaluate stages the project will continue to be reviewed to assess the cost and completion of deliverables.

The governance framework requires increasing cost accuracy as projects pass stage gate reviews. The costing information used in this proposal represents the best available information from SEPD and our SAVE project partners at the time of the preparation of the

## Low Carbon Networks Fund

### Full Submission Pro-forma

### Project Readiness continued

bid. However uncertainties in the costs and benefits may prevail due to certain assumptions made:

- the number of iterations of each trial needed to provide robust results
- other external factors affecting the validity of customer engagement

Each of the detailed work packages has identified associated risks and developed mitigating actions to form the basis of the contingency plans. Risk management will be conducted under the auspices of the SSEPD FNPMP 'Project Risk Management Plan'.

Our project has been constructed as an integrated whole, and any scope changes (if required) by Ofgem prior to project award will require a period of re-planning and possible re-negotiation with collaborators/suppliers which would delay commencement, and hence completion.

#### **6.6 Contingency Plan** (see Appendix D – Project contingency plan)

The project risk register and supporting process is used to identify inherent risks, specific controls/mitigation and the resulting residual risk. Specific contingency plans will be developed to enhance and support the specific risk controls where the specific risks are expected to or have materialised.

The detailed work produced to support the bid preparation provides a significant degree of comfort on our cost and funding estimates as described below. However, there are still elements of the solution that are still to be tendered or subject to contract finalisation, and may be subject to variation from our assumptions (both up and down). We are comfortable to accept the 0% level of protection against cost overruns.

#### **6.7 Verification of all information included in this proposal**

Information in this proposal has been developed in conjunction with all project partners and has been subject to checks and analysis to ensure its validity.

**Structure of bid:** The approach to the SAVE project has been developed in conjunction with the project partners. The project consists of a number of individual elements each of which is the responsibility of an individual organisation which in turn is responsible for its design and will be responsible for its delivery. Together the project team and the partners have considered these and ensured that they are realistic in terms of delivery, they are appropriate to the project overall and that the project as a whole will deliver the desired outcomes.

**Project costs:** Cost and technology information has been developed directly by Project Partners. Project Partners are experts in their field and independent of each other and SEPD. The costs for each element have been compared with the knowledge and experience of similar activities to allow verification of costs as the project has been built up.

## Low Carbon Networks Fund

### Full Submission Pro-forma

### Project Readiness continued

**Project management and governance:** Overall project rigour and review is in accordance with the SSEPD FNPMP which provides a whole-life cycle stage-gate review process and assess the project viability, delivery and safety with an independent steering group and review bodies. The FNPMP review process has been applied to verify this bid submission. The project plan has been developed following input from our project partners, to ensure the timescales are both achievable and robust.

**Regulatory matters:** The requirements for derogations in the SAVE project have been developed by SEPDP and its consultants and have been discussed with Ofgem (see Section 7 for more detail).

**Customer impacts:** Developed by the project team with linkage to our project partners.

**Successful Delivery Reward Criteria:** This has been developed in conjunction with our project plan to ensure the criteria put forward is SMART (see Section 9 for more detail).

**Partner Support:** To support our project readiness and provide an indication of the importance of the SAVE project we have attached a sample of the letters of support from our project partners (see Appendix P) and the full letters of support can be provided if required.

#### 6.8 Delivery of Learning

A central part of the SAVE project is the delivery of a model that allows comparisons between different options for energy efficiency and energy savings. To this end the level of take up of a particular measure resulting from an intervention carried out as part of the project is a key finding that will be built into the model. From this perspective low take up itself provides valuable information that can be applied in the future to proposed DNO activities providing guidance on the likely impact of any particular intervention.

#### 6.9 Process to identify when project should be suspended

Risk monitoring will be in accordance with the Future Networks Programme Management Procedure. Our risk monitoring procedures will be supported by the establishment of a Project Partner Review Board (PPRB) as supervised by the SSEPD Innovation Steering Board (ISB) for quality management purposes. An initial Project Risk Register (Appendix C) has been prepared and this will be maintained following the Bid Submission. Risk and issue identification will be the responsibility of all participants in the project. Changes and additional risks/issues will be managed by the Project Manager who is also responsible for identifying and agreeing mitigating actions and contingency plans with the next level of seniority. The register will be reviewed at the PPRB and risks categorised as 'high' (impact x likelihood) will be tabled at the ISB - unless a risk/issue warrant an exceptional meeting of the ISB - such as a significant cost over-run. In addition, the Future Networks Programme Management stage gate reviews give final assurance that the project purposes are being achieved, if corrective action is required and/or (in conjunction with Ofgem) the project should be terminated). The SEPDP Project Manager will be responsible for preparing and holding the PPRB with project partners and key suppliers whilst the Project Management Office (PMO) will be responsible for preparing materials for the Innovation Steering Board, both normally held monthly.



## Low Carbon Networks Fund

### Full Submission Pro-forma

### Section 7: Regulatory issues

This section should be between 1 and 3 pages.

☒ Please cross the box if the Project may require any derogations, consents or changes to the regulatory arrangements.

The SAVE project will explore new commercial models with which DNOs can interact with domestic customers. The trials will provide understanding of what sort of commercial mechanisms suit different customer types and customer behaviour in response to the mechanisms.

The project will generate learning about what new commercial mechanisms can be developed and how they could be implemented within existing regulatory frameworks and processes, as well as what their impacts are. Evidence from the project will be an important input to the work of industry groups considering changes to the contractual framework or charging methodologies, as it will test what can be achieved through existing processes.

Both SEPD (under Method 3) and multiple energy suppliers (under Method 4) will offer commercial incentives to encourage trial participants in the Solent region to shift / reduce their energy demand, based on distribution network requirements. Depending on the design of incentive mechanisms, modifications or derogations from regulatory arrangements may need to be sought by SEPD and/or suppliers.

The project will develop a network model to estimate the financial value of demand shift/reductions to the DNO, which will inform development of appropriate price signals to be passed to consumers.

The project will investigate the feasibility of passing price signals on to customers via a range of commercial mechanisms. We will investigate mechanisms which use the existing settlement system as currently managed under the Balancing and Settlement Code (BSC), including the changes which may be required to accommodate innovative trial or enduring arrangements, and mechanisms which would operate outside this process.

Mechanisms to be investigated include direct ex-gratia payments or alternative rewards (e.g. retail vouchers, credit to a local community fund) for participation and specific electricity consumption behaviours. The project will also investigate the feasibility of modifying Distribution Use of System (DUoS) charging to reward participants for energy efficient consumption i.e. more accurately reflect the costs incurred by the Distribution Business. This could involve incorporating a bespoke Time of Day (TOD) / Seasonal Time of Day (STOD) for a defined group of customers (trial participants) with a dedicated Line Loss Factors Class.

Under Standard Licence Condition (SLC) 13A Common Distribution Charging Methodology (CDCM), SEPD must use the CDCM to calculate Use of System charges for all premises connected to the network at a voltage level of less than 22 kilovolts and all trial participants will fall into this category. As the CDCM does not currently provide for

## Low Carbon Networks Fund

### Full Submission Pro-forma

#### Regulatory issues continued

innovative time of use charging arrangements for domestic customers, modification or derogation would be required to set up and apply such arrangements to trial participants as required for the duration of the trial. SLC 13A includes provision for modification of the CDCM (13A.5), subject to SLC 22A Governance and change control arrangement for Relevant Charging Methodologies, Part D: Governance and change control arrangements. Any modification of the CDCM would also require modification of the Use of System Charging Statement, as required under SLC 14 Charges for Use of System and Connection. If early findings indicate a change in DUoS tariff is an appropriate commercial mechanism, the project will follow relevant processes for modification, engaging with the Authority and all parties to the Distribution Connection and Use of System Agreement (DCUSA). The option of applying for a derogation would also be investigated: SLC 13A Part E: Derogations permits SEPD to apply for a direction from the Authority which relieves the licensee of its obligations under SLC 13A Part A "in respect of such elements of the CDCM to such extent, for such a period of time and subject to such conditions as may be specified in the direction".

Suppliers' development of commercial mechanisms (under Method 4) will focus on design of innovative Time of Use tariffs, which may include price signals during times focussed around SEPD substation/network peaks or other rewards for participation / consumption behaviours. Tariff development through the project will take into account the final proposals issued by the Retail Market Review (RMR) on 20 June 2013 (The Retail Market Review – Statutory consultation on the RMR domestic proposals, June 2013) which will come into force at the end of 2013, and have implications for suppliers' ability to offer innovative tariffs and incentives.

The RMR proposals aim to simplify energy tariffs - five meter categories are defined and for each one a supplier will only be able to offer four core tariffs to any customer. However, the proposals include provision for suppliers to apply for derogations in order to trial innovative tariffs, recognising that this is an important part of future market development. Preliminary correspondence with the Head of Retail Markets at Ofgem has indicated that the conditions and criteria relating to trial tariffs are yet to be finalised. To assure relevance of project findings to DNOs and suppliers in the future, the project will continue to engage with Ofgem's Retail Markets team to seek an 'agreement in principle' to support derogations for trial tariffs made through the SAVE project and ensure the innovative tariffs developed fit with the regulator's long term vision for development of 'smart' tariffs.

Derogation requests are likely to be required if individual suppliers design a new tariff which a) they wish to offer in addition to their four core tariffs for a given meter category and/or b) includes any cash discount or other cash incentive element. It is permissible under the RMR proposals to place access criteria on a tariff e.g. specific metering arrangements, customer age etc., provided all customers on a particular tariff have equal access to rewards and discounts. It is also permissible to set a cap on the number of customers who can access a tariff – in this case a cap could be related to sample size. While core tariffs must be offered to all customers in a given region, 'region' in this context refers to customer groups defined

## **Low Carbon Networks Fund Full Submission Pro-forma Regulatory issues continued**

by particular characteristics, not necessarily geographic location. Derogation is not required to offer non-cash incentives e.g. retail vouchers. Tariff design will include consideration of requirements to provide estimates of annual costs for a tariff and customers' rights with respect to switching tariffs/suppliers.

If suppliers offer different trials tariffs and incentives then they will need to submit individual derogation requests. We will confirm however whether the project can submit derogation requests on behalf of suppliers if they are offering identical tariff and incentive models.

See Appendix Q for a summary of the regulatory issues and derogations which may be required.

# Low Carbon Networks Fund

## Full Submission Pro-forma

### Section 8: Customer impacts

This section should be between 2 and 4 pages.

#### 8.1 Customer Engagement

The SAVE project will trial multiple methods of engaging with distribution network customers.

In the early months of the project a Customer Engagement Plan and Data Protection Strategy will be finalised after a review of best practice in customer engagement for smart meters and smart grids, drawing on global experiences. The approach for all trials will be written up in to a comprehensive document which will be provided to Ofgem for review before any customers are contacted.

At this stage we anticipate that the approach will commence with methods for recruiting customers on to trials. Southampton University will identify characteristics for trial participants and a trial recruitment professional will use this information to recruit the appropriate sample groups in order to ensure the project is statistically rigorous. By agreeing to participate these customers will agree to have their electricity consumption monitored by the project.

Once the appropriate sample has been recruited and monitoring equipment installed there will be a period of no engagement to collect baseline data. This data will help to feed in to detailed engagement approaches since an understanding of current consumption behaviour is a vital starting point for engagement.

Of the 4000 sample set, 1000 will remain as a control group and will not receive any further engagement. The remaining 3000 participants will be recruited on to the three trials:

1. LED installation
2. Data-informed engagement campaign
3. DNO price signals direct to customers plus data-informed engagement

Each group will receive initial engagement to enable the specific trial recruitment. This will be in the form of postcards inviting participants to join the trials, followed up with emails, phone calls and face-to-face meetings. Targeted film clips explaining the trials and what is expected of participants will be shared with participants. These clips will also be available on the project website and the Facebook project page. Once they commence the Data-informed trial and DNO price signals direct to customers trial will receive continuous engagement from multiple channels such as email, text messages, Facebook and postcards and flyers.

At the end of the first trial phase, a survey will be undertaken to gain greater understanding of what engagement techniques were perceived as effective. This will be compared to results from the trials to verify if electricity usage patterns did indeed change following the different engagement methods. This data will be fed in to the second trial iteration to tweak the engagement campaign.

The DNO price signals to suppliers to pass through to customers trial involves a different engagement approach (although monitoring and evaluation will take place in tandem with the other trials), which will be led by suppliers through coordination by ELEXON. The

## Low Carbon Networks Fund

### Full Submission Pro-forma

#### Customer impacts continued

suppliers have committed to installing 2,000 smart meters in the Solent project area. They will work directly with the organisation that wins the tender for initial recruitment and surveys to contact customers, with their selection methods influenced by UoS to ensure demographic representation. Their plans will be included in the customer engagement plan submitted to Ofgem towards the start of the project.

The creation of sustainable behaviour change as a result of proactive customer engagement is the principle of the third method being tested in the project via the Community Coach trial. Whilst this will draw upon a range of communications mediums, further proactive engagement will be realised thanks to Neighbourhood Economics and the outcomes of their feasibility study on behalf SEPD.

The solution recommended by Neighbourhood Economics as a result of the Feasibility Study is the Community Energy Coaching Programme- an initiative which will embed a Community Energy Coach in a community to work with a range of key stakeholders on a broad agenda to test and assess the potential to achieve energy reductions through sustainable behaviour change and complementary demand reduction initiatives.

The Community Energy Coach will be embedded within the area, working from within a local host organisation to facilitate change and empower each community to deliver and sustain its own demand reduction.

An examination of prior engagement campaigns will be carried out to ensure lessons learned elsewhere are taken on and used as building blocks to design the engagement process. This will take in to account work on previous LCNF projects such as CLNR and Low Carbon London and contact will be made with Northern Powergrid and UK Power Networks to gain insights in to their approach and findings. Projects that have been carried out globally such as the Solar City project in Perth, Australia and the Smart Hours project currently being carried out by Oklahoma Gas & Electric in the US will be reviewed extensively so the SAVE project can learn from their successes and challenges before commencing engagement.

In order to best engage customers the project will draw upon existing initiatives, projects and learning. These include:

- existing Future Solent and University of Southampton low carbon initiatives;
- learning, funding, skills and experience from the Universities of Southampton and Winchester's existing projects
- tariffs development expertise of Suppliers, SEPD and ELEXON
- working closely with local Councils, local generation and low carbon initiative groups
- customers - we will be engaging with a wide range of customers in the study zones where we propose to install and trial a variety of technologies and equipment

#### **8.2 The Solent Area**

The electricity network in the Solent area is typical of many urban and suburban areas in the UK: it serves a diverse mix of industrial, commercial, small business, residential and economic development along with a range of housing types including pockets of severe deprivation (see Appendix I).

A key part of the project is the engagement of domestic customers. As a result the project

## Low Carbon Networks Fund

### Full Submission Pro-forma

### Customer impacts continued

will organise a programme of campaigns and customer engagement events in the early stages where we (as a DNO) will speak directly to customers in the Solent.

Our vision in the Solent is to leave a legacy of a closer relationship between the DNO and customers, building on Ofgem's philosophy that DNOs should once again be speaking with customers.

#### **8.3 Working with Communities**

The engagement with customers and communities is vital to the success of our project and achieving effective demand reduction as a result of active participation. The SAVE project will address the challenge of raising the DNOs profile with customers and within communities. The project will also help to communicate with and educate customers on the low-carbon solutions and smart grid initiatives in a bid to achieve mutual benefits, such as reducing network peaks whilst saving customers money on their energy bill.

#### **8.4 The SAVE Project Implementation**

The project has been designed to maximise our positive interaction with customers whilst minimising any potential negative impacts from the trials.

#### **8.5 Interruptions / Quality of Supply**

A key part of the trials is the installation of sensors either in the houses, buildings or in the distribution substations. The monitoring will be via Smart Metering, non-invasive optic counting sensors (which handle digital and mechanical signals) and non-invasive substation monitoring equipment now being utilised in numerous LCNF projects. Therefore we do not anticipate any supply interruption for the customers, except the installation of the smart meters which will involve an interruption of supply at the point of installation (as part of normal procedures).

There are plans for two groups of smart meter customers in the project- a control group and another group trialling Time of Use tariffs. The project aims to install approximately 2,000 smart meters. To achieve this, all affected customers will experience a necessary interruption to connect their new meter, the duration of which is estimated to be a maximum of 2 hours (based on discussions with suppliers).

All details relating to these planned interruptions and installations will be included in the Customer Engagement Plan and Data Protection Strategy. The project recognises the importance of data storage and handling, and will produce a robust process culminating in the submission of the plans for Ofgem approval in the early stages of the project.



## Low Carbon Networks Fund Full Submission Pro-forma

### Section 9: Successful Delivery Reward Criteria

This section should be between 2 and 5 pages.

No.	SDRC	Sub-SDRC	Evidence	Date
1	Review learning from other projects	Produce report on UK and international efficiency project findings and the impact on the SAVE project, including recommendations and key suggestions to improve the project design and implementation	Present findings in the form of a written report to Ofgem	Jun-2014
2	Create customer model	2.1 Create initial customer model	Produce report and present to Ofgem	Dec-2014
		2.2 Revise customer model	Produce updated report and present to Ofgem	Dec-2016
		2.3 Finalise customer model	Host a demonstration of finalised customer model	Jun-2018
3	Improve customer engagement	3.1 Create Customer Engagement Plan	Submit Customer Engagement Plan to Ofgem	Feb-2014
		3.2 Hold at least one meeting to share progress, experiences and next steps with customers involved in trials	Produce report summarising objectives and outcomes of meeting(s)	Jan-2017
4	Create commercial energy efficiency measures	4.1 Establish the pricing model and processes for passing DNO price signals to Suppliers to pass through to customers	Prepare and present report on findings of exercise	Jun-2016
		4.2 Establish the pricing model and processes for passing DNO price signals direct to customers	Prepare and present report on findings of exercise	Jun-2016
5	Identify control and trial sample groups	Select the customers required for each group in the project, ensuring that they represent a cross-section of the population to allow extrapolation of results	Present findings and method of selection in report	Jun-2015

## Low Carbon Networks Fund

### Full Submission Pro-forma

### Successful Delivery Reward Criteria continued

<b>6</b>	Install 50% of optic sensors and smart meters	Successfully install 50% of the required number of optic sensors and smart meters within the properties of customers forming the trial groups, ensuring ability to retrieve data from both	Produce report detailing installation figures and indication of communications capability	Jun-2015
<b>7</b>	Create network model of energy efficiency measures	7.1 Create initial network model	Produce report and present to Ofgem	Dec-2014
		7.2 Revise network model	Produce updated report and present to Ofgem	Dec-2016
		7.3 Finalise network model	Host a demonstration of finalised customer model	Jun-2018
<b>8</b>	Close down reports	8.1 Overall project summary report including comparison of trial method impacts	Produce report and present to Ofgem	Jun-2018
		8.2 Network investment tool key outcomes report	Produce report and present to Ofgem	Jun-2018
		8.3 LED trial report	Produce report and present to Ofgem	Jun-2018
		8.4 DNO price signals direct to customers trial report	Produce report and present to Ofgem	Jun-2018
		8.5 DNO price signals to Suppliers trial report	Produce report and present to Ofgem	Jun-2018
		8.6 Network pricing model report	Produce report and present to Ofgem	Jun-2018
		8.7 Customer and network modelling report	Produce report and present to Ofgem	Jun-2018
		8.8 Data-informed engagement trial report	Produce report and present to Ofgem	Jun-2018
		8.9 Community coaching trial report	Produce report and present to Ofgem	Jun-2018

## **Low Carbon Networks Fund Full Submission Pro-forma Section 10: List of Appendices**

Appendix A Financial spreadsheet

Appendix B Project Plan

Appendix C Project Risk Register

Appendix D Project Contingency Plan

Appendix E Organogram & Roles and Responsibilities

Appendix F Diagram of trial summary

Appendix G SAVE model

Appendix H Planning model

Appendix I University of Southampton paper

Appendix J High-level project concept diagram

Appendix K Project phasing diagram

Appendix L Maingate proposal

Appendix M Community Coaching manual

Appendix N University of Bath Demand Analysis paper

Appendix O Partner information

Appendix P Sample of letters of support from partners

Appendix Q Summary of regulatory issues and derogations which may be required

Appendix R Sample of letters of support from suppliers

Appendix S UoS track record and role in the project

# LCN Fund Second Tier Full Submission Spreadsheet

(version 2.0)

## Appendix A

DNO Name:

**Southern Electric Power Distribution**

Submission Date:

**09/08/2013**

	Input cells
	Totals cells (of formula within worksheet)
	Referencing to other worksheets
	Check cells
	No Input
	Descriptions and pack data
	Ofgem Input cells

## Second Tier Funding Request

	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	Total	
<b>Total Project Cost</b>								
Cost	From Project Cost Summary sheet							
Labour	249.65	474.89	615.89	656.19	845.73	225.72	3,068.07	
Equipment	-	955.53	346.07	-	1.12	-	1,302.72	
Contractors	156.56	1,456.95	1,592.52	1,518.06	1,714.82	516.15	6,955.06	
IT	-	483.30	294.80	312.03	68.45	-	1,158.58	
IPR Costs	-	-	-	-	-	-	-	
Travel & Expenses	5.60	5.89	3.74	4.38	4.49	2.30	26.40	
Payments to users & Contingency	-	206.60	-	109.48	112.22	-	428.30	
Decommissioning	-	-	5.87	6.02	73.50	172.54	257.94	
Other	-	-	-	-	-	-	-	
Total	411.81	3,583.16	2,858.89	2,606.16	2,820.34	916.71	13,197.07	
<b>External funding</b>								
Any funding that will be received from Project Partners and/or External Funders - from Project Cost Summary sheet	-	-	-	-	-	-	-	
Labour	-	-	-	-	-	-	-	
Equipment	-	534.06	240.11	-	-	-	774.17	
Contractors	6.16	132.40	86.83	118.28	253.38	53.12	650.17	
IT	-	84.06	45.93	27.15	-	-	157.14	
IPR Costs	-	-	-	-	-	-	-	
Travel & Expenses	-	-	-	-	-	-	-	
Payments to users & Contingency	-	-	-	-	-	-	-	
Decommissioning	-	-	-	-	-	-	-	
Other	-	-	-	-	-	-	-	
Total	6.16	750.51	372.87	145.44	253.38	53.12	1,581.48	
<b>DNO extra contribution</b>								
Any funding from the DNO which is in excess of the DNO Compulsory Contribution - from Project Cost Summary sheet	-	-	-	-	-	-	-	
Labour	-	-	-	-	-	-	-	
Equipment	-	-	-	-	-	-	-	
Contractors	-	-	-	-	-	-	-	
IT	-	-	-	-	-	-	-	
IPR Costs	-	-	-	-	-	-	-	
Travel & Expenses	-	-	-	-	-	-	-	
Payments to users & Contingency	-	-	-	-	-	-	-	
Decommissioning	-	-	-	-	-	-	-	
Other	-	-	-	-	-	-	-	
Total	-	-	-	-	-	-	-	
<b>Initial Net Funding Required</b>								
calculated from the tables above	249.65	474.89	615.89	656.19	845.73	225.72	3,068.07	
Labour	-	421.46	105.96	-	1.12	-	528.54	
Equipment	150.40	1,324.56	1,505.69	1,399.78	1,461.44	463.03	6,304.89	
Contractors	-	399.25	248.87	284.87	68.45	-	1,001.45	
IT	-	-	-	-	-	-	-	
IPR Costs	5.60	5.89	3.74	4.38	4.49	2.30	26.40	
Travel & Expenses	-	206.60	-	109.48	112.22	-	428.30	
Payments to users & Contingency	-	-	5.87	6.02	73.50	172.54	257.94	
Decommissioning	-	-	-	-	-	-	-	
Other	-	-	-	-	-	-	-	
Total	405.64	2,832.64	2,486.03	2,460.73	2,566.96	863.59	11,615.59	Check Total = to Initial Net Funding request in Project Cost Summary OK
<b>Direct Benefit</b> from Direct Benefits sheet								
Total	-	-	-	-	-	-	-	
<b>DNO Compulsory Contribution / Direct Benefits</b> from Project Cost Summary sheet								
Labour	24.96	47.49	61.59	65.62	84.57	22.57	306.81	
Equipment	-	52.68	13.24	-	0.11	-	66.04	
Contractors	15.66	141.05	154.45	146.88	155.21	51.61	664.85	
IT	-	48.33	29.48	31.20	6.85	-	115.86	
IPR Costs	-	-	-	-	-	-	-	
Travel & Expenses	0.56	0.59	0.37	0.44	0.45	0.23	2.64	
Payments to users & Contingency	-	20.66	-	10.95	11.22	-	42.83	
Decommissioning	-	-	0.59	0.60	7.35	17.25	25.79	
Other	-	-	-	-	-	-	-	
Total	41.18	310.80	259.72	255.69	265.76	91.67	1,224.82	of Total Initial Net Funding Required OK Check that Total is = or > than Total Direct Benefits OK
<b>Outstanding Funding required</b> calculated from the tables above								
Labour	224.68	427.40	554.30	590.57	761.16	203.15	2,761.26	
Equipment	-	368.78	92.71	-	1.01	-	462.50	
Contractors	134.74	1,183.51	1,351.25	1,252.90	1,306.23	411.41	5,640.04	
IT	-	350.92	219.39	253.67	61.61	-	885.59	
IPR Costs	-	-	-	-	-	-	-	
Travel & Expenses	5.04	5.30	3.36	3.94	4.04	2.07	23.76	
Payments to users & Contingency	-	185.94	-	98.53	101.00	-	385.47	
Decommissioning	-	-	5.29	5.42	66.15	155.28	232.14	
Other	-	-	-	-	-	-	-	
Total	364.46	2,521.84	2,226.30	2,205.04	2,301.20	771.92	10,390.77	Check that Total is = to Total Outstanding Funding required OK
balance	9,975.10	7,088.80	5,033.13	2,949.31	727.94	(7.21)	9,975.10	
interest	0.00	170.64	121.22	79.82	36.77	7.21	415.66	
							10,390.77	
<b>SECOND TIER FUNDING REQUEST</b> £								
Bank of England interest rate	0.5%						9,975.10	
interest rate used in calculation	2.0%							
RPI adjustment	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21
Index	252.02	260.33	269.12	275.85	282.74	289.81	297.06	304.48
Annual inflation	3.00%	3.30%	3.40%	2.50%	2.50%	2.50%	2.50%	2.50%

n.b the Second Tier Funding Request calculation should use the Bank of England Base rate plus 1.5% on 31 June of the year in which the Full Submission is made.

click this button to  
calculate the Second  
Tier Funding Request

Direct Benefits

Direct Benefit: Any benefits of the Project accruing to the DNO during the Project Implementation and include the following

- Revenue included in the DNO's Full Business Plan Questionnaire (FBPQ) for DPCR5 which will be saved through undertaking the project
- Incentive payments generated as a result of the Project for the duration of the Project

Description of Direct Benefit	2013/14	2014/15	Total
N/A			-
			-
Total Direct Benefits	-	-	-

n.b. These are Direct Benefits associated with the Project itself, not the wider deployment of the Solution and therefore should not exceed beyond the project or the DPCR5 period



Cost Category	Cost
Labour	
	2761.26
Equipment	
	462.50
Contractors	
	5640.04
IT	
	885.59
IPR Costs	
	0.00
Travel & Expenses	
	23.76
Payments to users	
	385.47
Contingency	
	0.00
Decommissioning	
	232.14
Other	
	0.00
Total	10,390.77

Check that = to Total Outstanding Funding Required

OK

### Net Benefits

DNOs can provide notes alongside costing in order to aid understanding of why these costs are required. This should be supplemented by a fuller qualitative account of the Base Case method and Method in the appendices.

Method 1 -

- |     |   |               |       |
|-----|---|---------------|-------|
| (a) | Base Case costs                           |               |       |
|     | Description of cost                       | Cost (£)      |       |
|     | National Deployment of LEDs               | £1,182        |       |
|     | <b>Total</b>                              | <b>£1,182</b> |       |
| (b) | Method costs                              |               |       |
|     | Description of cost                       | Cost (£'m)    |       |
|     | Installation over the whole of the Solent | £68           |       |
|     | <b>Total</b>                              | <b>£68</b>    |       |
|     | <b>Net financial benefit</b>              | <b>£5,114</b> |       |
| (c) | Capacity released (kW)                    |               | 40 MW |
| (d) | Base Case time (months)                   |               | 54    |
| (e) | Method time (months)                      |               | 54    |

The aim of this report is to quantify the benefits from introducing LED lighting to domestic dwellings, both in term of the reduction in total energy consumption and the consequential reduction in future reinforcement cost for the DNO. This benefit case will show the positive effect of installing LEDs to a location and the link to the network benefits. The SAVE project will further investigate the value of LEDs and also other Efficiency measures which will add value to the business case.

- |     |   |            |
|-----|---|------------|
| (b) | Method costs                              |            |
|     | Description of cost                       | Cost (£'m) |
|     | Installation over the whole of the Solent | £68        |
|     | Total                                     | £68        |
|     | Net financial benefit                     | £1,114     |
| (c) | Capacity released (kW)                    | 40 MW      |
| (d) | Base Case time (months)                   | 54         |
| (e) | Method time (months)                      | 54         |

Cost of LED installation 12 bulbs) per dwelling	£137
Number of dwelling in the area	500k
Cost of LED installation over 40 years	137m

As the life of the LEDs is approx 15 years then we have allowed for two installation sets of costs in the calculation.

The cost of these 2 x installations over 500,000 homes in Solent areas would give the total installation cost of £89m, and £5.6m per year.

- |     |                         |    |    |
|-----|-------------------------|----|----|
| (c) | Capacity released (kW)  | 40 | MW |
| (d) | Base Case time (months) | 54 |    |
| (e) | Method time (months)    | 54 |    |

Anticipated electrical capacity released as a result of roll out of LED product across the Solent Area	
HV (GW)	40MW
LV (MW)	47MW
Reference Prof Furoong Li's paper "Benefits from Adoption of Energy Efficient Lighting" Appendix N attached to the SAVE Bid Submission Document	

- [illegible]

**Method 2 -**

- |     |                         |  |
|-----|-------------------------|--|
| (a) | Capacity released (kW)  |  |
| (b) | Base Case time (months) |  |
| (c) | Method time (months)    |  |

**Summary:**

- |     |                     |          |
|-----|---------------------|----------|
| (d) | Base Case costs     |          |
|     | Description of cost | Cost (£) |
|     |                     |          |
|     |                     |          |
|     | Total               | £0       |

In addition, the adoption of and LED solution for the DNO is a option and should be considered as a tool to assist the management of their networks in future.

- | Method costs          |          |
|-----------------------|----------|
| Description of cost   | Cost (£) |
|                       |          |
|                       |          |
| Total                 | £0       |
| Net financial benefit | £0       |

The LED adoption also brings £680k saving in average and in real term over the 25 year period. This is based on the premise that we can access this network benefit immediately. This implies an extra 11% discount per year for customers due to additional benefits from the HV/LV investment deferral. This additional network benefits will also increase the total net present value of the project from £57m

- [illegible]

The SAVE project will test the LED option and also explore LEDs working with and in competition with other Efficiency measures i.e. EE Campaigns, Smart Plugs, along with DNO and ToU Price Signals.

## Appendix B Project Plan

ID	Task Name	Duration	Start	1st Hal H1	2nd Ha H2	1st Hal H1	2nd Ha H2	1st Hal H1	2nd Ha H2	1st Hal H1	2nd Ha H2	1st Hal H1	2nd Ha H2	1st Hal H1	2nd Ha H2	1st Hal H1	2nd Ha H2	1st Hal H1
1	Start Up	80 days	Fri 09/08/13															
4	Workpackage 1 Project management	1269 days	Fri 09/08/13															
157	SDRC 1 Review Learnings from Other Projects	0 days	Mon 30/06/14															
159	SDRC 5 Identify control and trial sample groups	0 days	Tue 30/06/15															
161	Workpackage 2 - Customer Model Development Data Analy	1347 days	Fri 01/11/13															
175	SDRC 2 Create Customer Model	891 days	Wed 31/12/14															
179	Workpackage 3 - Network Model Development	1216 days	Fri 01/11/13															
189	SDRC 7 Create network model	891 days	Wed 31/12/14															
193	Workpackage 4 - Participant Recruitment, Participant Recr	1109 days	Tue 01/04/14															
198	Workpackage 5 - Meter & Data Gathering, Collation, Centra	1109 days	Mon 03/03/14															
207	SDRC 6 Install 50% sensors and smart meters	0 days	Tue 30/06/15															
209	Integration/UX work	134 days	Tue 30/06/15															
212	Baseline Monitoring	783 days	Wed 01/07/15															
214	Support Services	891 days	Wed 01/10/14															
218	De-Commissioning	130 days	Mon 01/01/18															
220	Workpackage 6 - Knowledge Dissemination	1164 days	Mon 06/01/14															
230	Trial Set Up	653 days	Wed 01/07/15															
245	1st Trial Iteration	780 days	Mon 06/01/14															
259	SDRC 3 Improved Customer Engagement	762 days	Fri 28/02/14															
262	1st Trial Review	131 days	Fri 01/07/16															
265	2nd Trial Iteration	325 days	Mon 02/01/17															
279	2nd Trial Review	130 days	Mon 03/07/17															
282	Project Conclusions, Evaluation and Reporting	130 days	Mon 01/01/18															
286	SDRC 4 TOU Tariff and DNO Incentive	0 days	Thu 30/06/16															
289	SDRC 8 Close Down Reports	0 days	Fri 29/06/18															

# Appendix C Project Risk Register

SAVE RISK REGISTER																		
Ref No.	Description	Existing Controls	Likelihood	Severity				RISK	Mitigation / Contingency	Resp	Target Date	Actions / Status	Residual Likelihood	Residual Impacts				Residual RISK
				People	Envir't	Asset	Reput'n							People	Envir't	Asset	Reput'n	
Workpackage 1 - Project Management																		
1	Resourcing the SAVE Project internally to SEPD	Future Networks Recruitment Procedure;	Remote	2	1	1	3	L		SEPD		Arrange FN Recruitment Procedure to be initiated before the Decision Date; provide HR with advance requirements of Resource	Remote	2	1	1	3	L
2	Break up of Partnership	Memorandum of Understanding in place with all project Partners - to show commitment to project.	Probable	3	2	2	4	H	MOUs to be replaced by contracts asap. Letters of support to project from Senior Company Representatives	All Parties		Contract negotiations to start immediately after the positive decision date, again escalation procedure up to ISB available	Probable	3	2	2	4	H
3	Lack of budget to complete project and over spend on budget;	FN procedure PR-PS-FNP-001	Occasional	2	2	2	3	M	Regular meetings and workshops with project partners; build up the costs via bottom up approach target. Value for money exercises will be carried out with Monitoring, Recruitment and LED trial	All parties		Continue with workshops and partner meetings up to the decision date - just to finalise the costs and target dates.	Occasional	2	2	2	3	M
4	Inability of recruiting the necessary number of customers for the trials across the Solent area	Professional market research company will be appointed by the SAVE project. The company will be chosen because of their experience and expertise in this area. The process will be overseem by the University of Southampton	Probable	2	2	2	4	H	Constant monitoring will be required of this key milestone. Regular review meetings will be carried out during this process. Existing escalation process in place via Project Director to SEPD ISB	All parties		No surprises - flag up issues well in advance of this happening. No contact without Customer and data strategies being agreed by OFGEM	Probable	2	2	2	4	H
5	Lack of data available to the Trial zones and an overall lack of learning to SEPD.	ICT Manager actively involved in designing the technical and data flow architecture and method of work. This work will continue up to and beyond the decisions datesto ensure suitable solution. attendance at regular PM meetings essential	Occasional	2	2	2	2	M	Regular meetings will continue in this area. Regular reviews of this important milestone will continue. Escalation through the ISB.	SEPD		If data cannot be released to the individual trial zones, the real simulation would be limited. Resource requirement has been requested in the project to make this happen. models, this risk has a low probability	Occasional	2	2	2	2	M
6	Lack of availability of suitable learning from the SAVE project	Follow SAVE milestones and SDRC targets; FN Knowledge Management W1-PS-FNP-012	Remote	2	2	2	4	M	Regular meetings will continue in this area. Regular reviews of this important milestone will continue. Escalation through the ISB.	PM		The SAVE learning process will be followed and reviewed on a regular basis	Remote	2	2	2	4	M
Workpackage 2 - Customer Model Development Data Analysis and Reporting																		
7	Inadequate data for the initial modelling	Careful and detailed planning of customer recruitment required	Remote	3	1	1	2	L		UOS		Detailed planning requirement at start up and continuous review afterwards	Remote	3	1	1	2	L
8	Inadequate numbers of customers sign up to trials	Again all in the planning of the customer recruitment strategy	Improbable	3	1	1	2	M		UOS		Detailed planning requirement at start up and continuous review afterwards	Improbable	3	1	1	2	M
9	Types of customers not suitable for modelling	Again all in the planning of the customer recruitment strategy	Improbable	2	2	1	2	L		UOS		Detailed planning requirement at start up and continuous review afterwards	Improbable	2	2	1	2	L
10	Failure of equipment and lack of data	Review with Maingate and ELEXON. plan for this events in the initial planning	Occasional	3	1	1	4	H	The length of time to recruit customer recruitment and allowed more planning time for this activity. Reguar reviewing of progress required at ISB meeting	All Parties		Continuous review with Mainaget and reporting	Occasional	3	1	1	4	H
11	Inadequate Outputs from Modelling	Review regularly with the project team and UOB	Remote					L		UOS		Continuous Reviews and	Remote	0	0	0	0	L
Workpackage 3 - Network Model Development																		
12	Lack of existing network information on the Solent networks - could cause delays and inaccurate results	Planning engineering resource allocated to the SAVE the project. Existing Long Term Development Statement, GIS and SIMS to be used	Remote	2	1	1	3	M	Regular meetings will continue in this area. Regular reviews of this important milestone will continue. Escalation through the ISB.	SEPD		Authority to allow partners to use SEPD data to be requested as soon as the project is accepted	Remote	2	1	1	3	M
13	Lack of interest from industry in reviewing report and recommendation; Can't use industry feedback to improve model	The project will use project partner University of Bath - Prof Furong Li who is already an expert in this field and working on other similar LCNF projects	Remote	2	1	1	2	L		All parties		Ongoing engagement with other LCNF projects will notify them when input is wanted. Offer support to other LCNF projects in return for input	Remote	2	1	1	2	L
14	International regulatory models too diverse from the UK; Difficulty in establishing comparisons from international case studies with UK	The project will use project partner University of Bath - Prof Furong Li who is already an expert in this field and working on other similar LCNF projects	Remote	2	1	1	2	L		UoB		Review and ensure choice of international case studies include countries with similar regulatory mechanisms to start with.	Remote	2	1	1	2	L
15	Report and recommendations insufficiently detailed or backed by evidence; Inconsistency in feedback and weak support for regulatory recommendations	The project will use project partner University of Bath - Prof Furong Li who is already an expert in this field and working on other similar LCNF projects	Remote	2	1	1	2	L		UoB		Further research and consultation needed to develop understanding of stakeholder requirements; If undertaken within project would need diversion of budget and resources.	Remote	2	1	1	2	L
16	Report and recommendations insufficiently detailed or backed by evidence; Inconsistency in feedback and weak support for regulatory recommendations	The project will use project partner University of Bath - Prof Furong Li who is already an expert in this field and working on other similar LCNF projects	Occasional	2	1	1	3	M	Regular review meeting will be carried out and outputs regularly reviewed by senior team members.	All parties		Further research and consultation needed to develop understanding of stakeholder requirements; If undertaken within project would need diversion of budget and resources.	Occasional	2	1	1	3	M

# Appendix C Project Risk Register

Workpackage 4 - Participant Recruitment, Participant Recruitment/ Trial Surveys & Field Trials																		
17	Insufficient participants can be recruited affecting the statistical validity of trials.	Although this activity as being being tendered we will employ experienced and trusted recruiters. This activity will be supervised by the University of Southampton - also experienced Researchers.	Probable	3	3	3	4	H	Regularly monitoring by the SEPD Steering Board	UoS		Aim for higher level of recruitment to get required numbers.; Review requirement for the statistical sample; Employ experienced and trusted recruiters; Extend the recruitment period.	Probable	3	3	3	4	H
18	Insufficient interest from MRS companies in tendering process	Take advice from UoS who have experience in this type of work from previous research work	Remote	3	1	2	3	M	Review at monthly procurement meetings	SEPD/ UoS		Early visibility and details of project requirements to be passed and discussed with SEPD procurement in advance of decision date	Remote	3	1	2	3	M
19	Participant sample is skewed to a particular societal sub group; Difficult to apply findings to other areas	This will be part of the University of Southampton's priorities when designing the study areas.	Remote	2	2	2	2	L		UoS		Set specific parameters for recruitment; Recruit across a wide area.	Remote	2	2	2	2	L
20	Customers moving or circumstances change	This is part of the study trials, will be reviewed and reported on a regular basis.	Occasional	3	1	2	2	M	Recruit more and monitor closely	UoS		Higher level of recruitment required to cover off drop outs; 15 % decommissioning costs allowed for within the budget	Occasional	3	1	2	2	M
21	Sample is subject to self selection by participants; Outcomes are skewed and not representative.	This will be part of the University of Southampton's priorities when designing the study areas.	Improbable	2	2	2	2	L		UoS		Set specific parameters for recruitment; Recruit across a wide area.	Improbable	2	2	2	2	L
Workpackage 5 - Meter & Data Gathering, Collation, Central Data Repository																		
22	Supplier DCs do not collect or provide required data; Delays to trial schedule; Difficulties in statistical analysis; Delays in processing results	Require suppliers to engage early enough to ensure DCs are in place and trained in the project requirements	Remote	2	2	2	2	M	Suppliers and the UoS to agree data required for the trials. Carry out pilot trial and review.	PM		All recruitment plans and campaigns to be agreed in advance. This will be done for parts of recruiting customers - Suppliers, Community Coaches and Market Researchers	Remote	2	2	2	2	M
23	Lack of broadband coverage in the study areas	working on a basis of 75% coverage in the Solent area	Occasional	3	2	2	3	M	Maingate and SEPD to review coverage and introduce new plans if required	Maingate/ PM		25% Sim card penetration allowed for in budget	Occasional	3	2	2	3	M
24	Monitoring equipment cannot be installed in time to support trials; Delays to trials schedule and subsequent activities	Start installation as soon as possible; Monitor progress and employ additional resource if necessary	Probable	2	3	3	4	H	We have already doubled the length of time to recruit customer recruitment and allowed more planning time for this activity	All Parties		Start installation as soon as possible; Monitoring to be run in parallel with the recruitment process; review progress and employ additional resource if necessary.	Probable	2	3	3	4	H
25	Underestimate numbers of HH metering systems to be installed; Additional cost to the project, or reduction in number of participants	Recruitment plans and data groups have to be agreed in advance of recruitment exercise	Occasional	2	1	2	2	M	Detailed plans will be agreed in the 1st phase of project plan	UoS/ Elexon		Detailed analysis and plans to be agreed in the first phase of the project	Occasional	2	1	2	2	M
26	Metering systems not operational on time; Delay to start of trial; Customers dissatisfied with trial	Carefully manage area survey workpackages to ensure complete on time	Improbable	3	3	2	3	M	Contingency plans in place to backfill missing systems. Carry out a pilot installation and review	Maingate		Metering system suppliers lined up to provide devices according to the project schedule.	Improbable	3	3	2	3	M
27	Noticeable differences in accuracy/ repeatability of data metering systems; Difficulties in statistical analysis; Need to replace meters and repeat trials	Calibrate critical devices in advance of delivery to customers	Remote	2	2	2	2	M	Call centre in place to support the devices and data handling. Support team available to advise and repair devices	Maingate		Understand performance differences in systems before the trials and determine whether correction factors are needed. Check early in the trial that data is comparable and modify correction factors if necessary.	Remote	2	2	2	2	M
28	Control group not controlled or representative of sample groups; Difficulties in statistical analysis	Recruitment plans and data groups have to be agreed in advance of recruitment exercise	Probable	2	2	2	2	M	Contingency plans in place to backfill missing systems	UoS		Have surplus control group against trial sample sizes. Ensure demographic and energy use data on trial participants is well understood beforehand. Historic data could be used if necessary.	Probable	2	2	2	2	M
29	Failure in data management system; Loss or corruption of data	Trials are designed to repeat in cycles so that loss of one trial cycle doesn't affect overall validity of project results	Remote	2	2	2	2	L		Maingate		Ensure disaster recovery plans are in place and fit for purpose.	Remote	2	2	2	2	L
Workpackage 6 - Knowledge Dissemination																		
30	In adequate Resources to meet OFGEM reporting and learning events	Employ full time Outputs Manager	Improbable	3	2	2	4	M	Subject to ISB reviews	SEPD		Full time resource employed to cover workload	Improbable	3	2	2	4	M
31	Inadequate budget to cover Training element of the programme	Ensure budget included in project budget	Improbable	2	1	1	2	L		SEPD		Included in SAVE budget	Improbable	2	1	1	2	L
32	Inadequate Quality of Close down reports	Follow SEPD Knowledge Learning procedure	Improbable	3	1	1	4	L				Follow SEPD Knowledge procedure	Improbable	3	1	1	4	L
33	No access to the ENA portal and web sites	Carry out some pilot inactions with the software and hardware	Improbable	2	1	2	3	L		SEPD		Trial in davance of starting project	Improbable	2	1	2	3	L
Trials																		
Workpackage 7 - LED Trial (To be Tendered as part of the project)																		
34	Lack of interest from LED suppliers in tendering request	Detailed procurement work required to ensure enough interest in the tender - seek industry advice	Occasional	2	1	2	2	L		SEPD		Tendering process to be planned and in detail in advance	Occasional	2	1	2	2	L
35	Not enough customer interest in LED project to make a meaningful trial	Pre tendering work required after decision day	Occasional	3	1	2	3	L		SEPD			Occasional	3	1	2	3	L
36																		
37	Lack of interest in project from customers in the SP trial	SP trial to support other trial eg campaigns and DNO Rebates	Occasional	2	1	2	3	L		UoS/KEMA		We have already reviewed potential companies	Occasional	2	1	2	3	L

# Appendix C Project Risk Register

38	Lack of equipment suppliers - use Maingates SP to reduce complexity of data and technology integration	SEPD and other partners are currently working on the design and plans for integration	Improbable	2	1	2	2	L		Maingate		Decision to utilise Maingates SP technology to mitigate the integration risks	Improbable	2	1	2	2	L
39	Equipment faulty and data not available	Equipment regularly monitored and supported by help desk and support staff	Remote	2	1	2	3	L		Maingate		Call centre in place to support the devices and adia handling. Support team available to advise and repair devices	Remote	2	1	2	3	L
40	Customer unable to fit SP on appliances	Using the tried and tested scanadanavion method of delivery and support of customers	Remote	3	1	3	3	M	SP to be send out with Gateway equipment	Maingate		Call centre in place to support the devices and adia handling. Support team available to advise and repair devices	Remote	3	1	3	3	M
Workpackage 9 - Supplier and DNO Price Signals																		
41	Derogations not received for trial tariffs and incentives; Unable to commence designed tariff trials	Project partner Elexon will manage this process. Early discussions with OFGEM have already taken place	Probable	2	1	2	4	H	Discussions already taking place with OFGEM to ensure compliance	Elexon		Communicate with RMR unit in Ofgem pre-award to check the proposals are compliant. If not, there is time to introduce more standard tariff and incentives.	Probable	2	1	2	4	H
42	Insufficient numbers of participants recruited	Delays to start of trial; Difficulties in statistical analysis	Probable	3	1	1	4	H	Project already focussed in getting the recruitment numbers. Use a professional market research team in the recruitment phase of the project	Elexon/ UoS		Increase engagement and comms effort in the Solent region. Introduce further incentives for participants to recruit others. Utilise Future Solent and local Authorities as contacts	Probable	3	1	1	4	H
43	Customers withdraw from trials	Need to continue recruitment activities; Loss of data to inform analysis	Occasional	2	1	2	3	L		Elexon/ UoS		Engage regularly to understand any dissatisfaction early. Understand concerns and take action to minimise further losses. Request participants allow shadow meter to remain so that data can continue to be collected without their intervention.	Occasional	2	1	2	3	L
44	Suppliers withdraw from trials	Project partner Elexon will maintain the "honest broker" relationship with the suppliers. Letters of intent received for all suppliers involved in the project	Improbable	2	1	2	2	L		Elexon/ SEPD		Dedicated support manager will maintain relationship with each supplier. Help provided for derogations, bill changes, introduction of new tariffs, comms material	Improbable	2	1	2	2	L
45	Supplier billing systems not modified properly or on time	Delays to start of trial; May need to change to DNO-led aggregation and settlement; Customer dissatisfaction if bills are incorrect	Remote	2	1	2	3	M	Part of the project evaluate different billing systems	Elexon		Detailed discussions with suppliers at project commencement to establish the extent of the challenge and the actions to be taken to have systems ready on time.	Remote	2	1	2	3	M
46	Customers do not see expected savings	Customers could withdraw from trials; Could affect future recruitment; Could result in negative publicity.	Remote	2	1	2	3	L				Manage expectations at the start - customers may not see reductions but should not see increases as a result of energy saving devices. Weather conditions could cause increases to need to understand effect.	Remote	2	1	2	3	L
Workpackage 10 - Campaigns																		
47	Inability to come up with appropriate campaigns	DNV KEMA will coordinate and manage the campaigns and report to the SAVE project team	Improbable	2	1	2	2	L		DNV Kema		Agree scope in the first phase of the SAVE project - produce clear and smart integration strategy	Improbable	2	1	2	2	L
48	Break up of partnership	DNV KEMA will coordinate and manage the campaigns and report to the SAVE project team	Remote	2	1	2	3	M	Regular reviews of performance required	DNV Kema		Set out expectations to UoW at the very start of the project. Campaigns must be targetted and smart and suitable for the project	Remote	2	1	2	3	M
49	Failure to deliver on time and on budget	DNV KEMA will coordinate and manage the campaigns and report to the SAVE project team	Remote	2	1	2	2	L		DNV Kema		Set out expectations to UoW at the very start of the project. Campaigns must be targetted and smart and suitable for the project	Remote	2	1	2	2	L
50	Inadequate quality of campaigns	Review quality during trials	Improbable					L		DNV Kema		Set out Smart objectives to the UoWinchester	Improbable	0	0	0	0	L
51	Ineffective campaigns	DNV have responsibility of integrate UoW into the main project	Remote					L		DNV Kema		Set out Smart objectives to the UoWinchester	Remote	0	0	0	0	L
Workpackage 11 - Community Coaching																		
52	Lack of community 'buy in' to the programme	Creative programme of engagement based on local priorities	Remote	2	1	1	3	L		NE		Design Intelligent Campaigns, integrate with DNV KEAM	Remote	2	1	1	3	L
53	Coaches leaving to find on-going employment before the end of the programme	Alternative income generation in place, secure HR procedure	Improbable	2	1	1	3	L		NE		Regular Performance Management	Improbable	2	1	1	3	L
54	Community coaching impacts other trials	Trial outcomes are not representative of trial effects alone	Occasional	2	1	1	3	L		NE		Ensure that other trial participants are not selected from areas close to the Community Coaching trial area	Occasional	2	1	1	3	L
55	Lack of adequate funding/ resource secured to sustain the programme	Shared ownership of benefits of programme/ KPIs from programme inception to ensure longer term buy in	Improbable	2	1	1	3	L		NE		Budget approved in Project Budget	Improbable	2	1	1	3	L
56	Key stakeholders unable to deliver focussed delivery of effort within target communities	Use position of SEPD and innovative nature of research to champion support at high level	Remote	2	1	1	3	L		NE		Regular Project Team meetings to discuss progress	Remote	2	1	1	3	L
57	Other/External factors impacting on load causes disruption to research progression	Wide range stakeholder engagement to ensure good knowledge of external impacting factors	Improbable	2	1	1	3	L		NE		Agree priorities at initial project team meetings and liaise with UoS	Improbable	2	1	1	3	L
58	Inadequate Learning from Trial	Regular reporting at project review meetings - remedial action agreed as required	Remote	2	1	1	3	L		NE		Regular review meetings required	Remote	2	1	1	3	L



# Appendix D Project Contingency Plan

## SAVE CONTINGENCY PLAN

Ref No.	Description	Existing Controls	Likelihood	Severity				RISK	Immediate Action	Interim Measures	Long Term Recovery	Target	Resp
				People	Envir't	Asset	Reput'n						
2	Break up of Partnership	Memorandum of Understanding in place with all project Partners - to show commitment to project	Probable	3	2	2	4	H	Secure confidential and/or commercial data Inform stakeholders and other project partners Identify remaining common ground and seek continued engagement as appropriate	Assess impact on specific task and on wider project deliverables If appropriate, complete debrief/lessons learnt process with existing partner Identify alternative partners as appropriate and required Assess impact on specific task and on wider project deliverables	Completion or cancellation of specific tasks - cancellation only with consent from relevant stakeholders		
3	Lack of budget to complete project and over spend on budget;	FN procedure PR-PS-FNP-001	Occasional	2	2	2	3	M	Regular meetings and workshops with project partners to build up costs from bottom up approach. Value for money exercises will be carried out with Monitoring, Recruitment and LED trial	Continue with workshops and partner meetings up to the decision date to further refine costs. - Value for money exercises will be carried out with Monitoring, Recruitment and LED trial just to finalise the costs and target dates.	Look at reducing scope of project to fit budget		
4	Inability of recruiting the necessary number of customers for the trials across the Solent area	Professional market research company will be appointed by the SAVE project. The company will be chosen because of their experience and expertise in this area. The process will be overseen by the University of Southampton	Probable	2	2	2	4	H	Utilise experience market research company for this exercise University of Southampton to supervise Contract preparation Employ experience and quality company for the project No contact without Customer and data strategies being agreed by OFGEM	Carry out regular reviews of numbers; No surprises - flag up issues well in advance of a programme. Escalation to ISB.	Implement task to achieve deliverables – though, this may require an alternative company or technique.		
5	Lack of data available to the Trial zones and an overall lack of learning to SEPD.	ICT Manager actively involved in designing the technical and data flow architecture and method of work. This work will continue up to and beyond the decisions date to ensure suitable solution. attendance at regular PM meetings essential	Occasional	2	2	2	2	M	Regular meetings will continue in this area. Regular reviews of this important milestone will continue. Escalation through the ISB.	If data cannot be released to the individual trial zones, the real simulation would be limited. Resource requirement has been requested in the project to make this happen. models, this risk has a low probability	Implement task to achieve deliverables – though, this may require an alternative company or technique.		
6	Lack of availability of suitable learning from the SAVE project	Follow SAVE milestones and SDRG targets; FN Knowledge Management W1-PS-FNP-012	Remote	2	2	2	4	M	Regular review meetings will continue in this area. Complete learning logs, learning meetings, reviews with PM	The SAVE learning process will be followed and reviewed on a regular basis	Re-visit project output strategy and produce new learning plan		
8	Inadequate numbers of customers sign up to trials	Again all in the planning of the customer recruitment strategy	Improbable	3	1	1	2	M	Utilise experience market research company for this exercise University of Southampton to supervise Contract preparation Employ experience and quality company for the project No contact without Customer and data strategies being agreed by OFGEM	Carry out regular reviews of numbers; to avoid surprises - flag up issues well in advance of a programme. Detailed planning requirement at start up and continuous review afterwards	Implement task to achieve deliverables – though, this may require an alternative company or technique.		
10	Failure of equipment and lack of data	Review with Mairgate and ELEXON, plan for this events in the initial planning	Occasional	3	1	1	4	H	The length of time to recruit customer recruitment and allowed more planning time for this activity. Regular reviewing of progress required at ISB meeting	Triggered by performance trials Complete peer review of technology to identify potential solutions Review alternative technologies Explore long-term application of other similar technologies	Record findings for learning outcomes Mitigate impact on other tasks by implementing simulations		
12	Lack of existing network information on the Solent networks - could cause delays and inaccurate results	Planning engineering resource allocated to the SAVE the project. Existing Long Term Development Statement, GIS and SIMS to be used	Remote	2	1	1	3	M	Regular meetings will continue in this area. Regular reviews of this important milestone will continue.	Authority to allow partners to use SEPD data to be requested as soon as the project is accepted	Implement task to achieve deliverables – though, this may require an alternative technology/design strategy.		
14	Report and recommendations insufficiently detailed or backed by evidence; Inconsistency in feedback and weak support for regulatory recommendations	The project will use project partner University of Bath - Prof Fulong Li who is already an expert in this field and working on other similar LCNF projects	Occasional	2	1	1	3	M	Regular review meeting will be carried out and outputs regularly reviewed by senior team members.	Further research and consultation needed to develop understanding of stakeholder requirements; If undertaken within project would need diversion of budget and resources.	Record the current findings for learning outcomes Mitigate impact on other tasks by implementing simulation		
15	Insufficient participants can be recruited affecting the statistical validity of trials.	Although this activity as being being tendered we will employ experienced and trusted recruiters. This activity will be supervised by the University of Southampton - also experienced Researchers.	Probable	3	3	3	4	H	Utilise experience market research company for this exercise University of Southampton to supervise Contract preparation Employ experience and quality company for the project No contact without Customer and data strategies being agreed by OFGEM	Aim for higher level of recruitment to get required numbers.; Review requirement for the statistical sample; Employ experienced and trusted recruiters; Extend the recruitment period.	Implement task to achieve deliverables – though, this may require an alternative company or technique.		
16	Insufficient interest from MRS companies in tendering process	Take advice from UoS who have experience in this type of work from previous research work	Remote	3	1	2	3	M	Plan the customer campaigns carefully; Review at monthly procurement meetings	Early visibility and details of project requirements to be passed and discussed with SEPD procurement in advance of decision date	Implement task to achieve deliverables		
19	Supplier DCs do not collect or provide required data; Delays to trial schedule; Difficulties in statistical analysis; Delays in processing results	Require suppliers to engage early enough to ensure DCs are in place and trained in the project requirements	Remote	2	2	2	2	M	Suppliers and the UoS to agree data required for the trials	All recruitment plans and campaigns to be agreed in advance. This will be done for parts of recruiting customers - Suppliers, Community Coaches and Market Researchers	Implement task to achieve deliverables – though, this may require an alternative technology/design strategy.		
20	Monitoring equipment cannot be installed in time to support trials; Delays to trial schedule and subsequent activities	Start installation as soon as possible. Monitor progress and employ additional resource if necessary	Probable	2	3	3	4	H	Doubled the length of time to recruit customer recruitment and allowed more planning time for this activity Assess significance of delay to task delivery and discuss alternative programme phasing with project partners Trial other tasks using simulated data whilst delay is worked-through	Monitoring to be run in parallel with the recruitment process; Review progress and employ additional resource if necessary.	Implement task to achieve deliverables – though, this may require an alternative technology/design strategy.		

## Appendix D Project Contingency Plan

21	Underestimate numbers of HH metering systems to be installed; Additional cost to the project, or reduction in number of participants	Recruitment plans and data groups have to be agreed in advance of recruitment exercise	Occasional	2	1	2	2	M	Detailed plans will be agreed in the 1st phase of project plan	Re-assess numbers and the significance to task delivery Discuss alternative programme phasing with project partners	Mitigate impact on other tasks by implementing simulation		
21	Customers moving or circumstances change	This is part of the study trials, will be reviewed and reported on a regular basis.	Occasional	3	1	2	2	M	Recruit more and monitor closely	Higher level of recruitment required to cover off drop outs. 15 % decommissioning costs allowed for within the budget	Mitigate impact on other tasks by implementing simulation		
22	Metering systems not operational on time; Delay to start of trial; Customers dissatisfied with trial	Carefully manage area survey workpackages to ensure complete on time	Improbable	3	3	2	3	M	Contingency plans in place to backfill missing systems with optical sensors	A number of Suppliers engaged in the project. Metering system suppliers lined up to provide devices according to the project schedule.	Implement task to achieve deliverables – though, this may require an alternative technology/design strategy.		
23	Noticeable differences in accuracy/ repeatability of data metering systems; Difficulties in statistical analysis Need to replace meters and repeat trials	Calibrate critical devices in advance of delivery to customers	Remote	2	2	2	2	M	Call centre in place to support the devices and data handling. Support team available to advise and repair devices	Review performance differences in systems determine whether correction factors are needed. Check early in the trial that data is comparable and modify correction factors if necessary.	Mitigate impact on other tasks by implementing simulation		
24	Control group not considered as representative of sample groups; Difficulties in statistical analysis	Recruitment plans and data groups have to be agreed in advance of recruitment exercise	Probable	2	2	2	2	M	Contingency plans in place to backfill missing systems	Have surplus control group against trial sample sizes. Ensure demographic and energy use data on trial participants is well understood beforehand. Historic data could be used if necessary.	Record the current findings for learning outcomes Mitigate impact on other tasks by implementing simulation		
26	In adequate Resources to meet OFGEMs reporting and learning events	Employ full time Outputs Manager	Improbable	3	2	2	4	M	Appoint full time resource to handle task	Full time resource employed to cover workload	Mitigate impact on other tasks by implementing simulation		
34	Customer unable to fit SP on appliances	Using the tried and tested Scandinavian method of delivery and support of customers	Remote	3	1	3	3	M	Smart Plugs to be sent out with Gateway equipment	Call centre in place to support the devices and data handling. Support team available to advise and repair devices	Review process and change with manual process if required		
35	Derogations not received for trial tariffs and incentives; Unable to commence designed tariff trials	Project partner Elexon will manage this process. Early discussions with OFGEM have already taken place	Probable	2	1	2	4	H	Discussions already taking place with OFGEM to ensure compliance	Communicate with RMR unit in Ofgem pre-award to check the proposals are compliant. If not, there is time to introduce more standard tariff and incentives.	Mitigate impact on other tasks by implementing simulation		
26	Insufficient numbers of participants recruited	Delays to start of trial; Difficulties in statistical analysis	Probable	3	1	1	4	H	Project already focussed in getting the recruitment numbers. Appoint a professional MRS market research team in the recruitment phase of the project	Increase engagement and comms effort in the Solent region. Introduce further incentives for participants to recruit others. Utilise Future Solent and local Authorities as contacts	Review process and change with manual process if required		
37	Lack of broadband coverage in the study areas	Working on a basis of 75% coverage in the Solent area	Occasional	3	2	2	3	M	Maingate and SEPD to review coverage and introduce new plans if required	Maingate/ PM	25% Sim card penetration allowed for in budget	Occasional	
39	Supplier billing systems not modified properly or on time	Delays to start of trial; May need to change to DNO-led aggregation and settlement; Customer dissatisfaction if bills are incorrect	Remote	2	1	2	3	M	Part of the project evaluate different billing systems	Detailed discussions with suppliers at project commencement to establish the extent of the challenge and the actions to be taken to have systems ready on time.	Review process and change with manual process if required		
42	Break up of partnership	DNV KEMA will coordinate and manage the campaigns and report to the SAVE project team	Remote	2	1	2	3	M	Secure confidential and/or commercial data. Investigate Alternative suppliers of the service.	Set out expectations to UoW at the very start of the project. Campaigns must be targeted and smart and suitable for the project	Completion or cancellation of specific tasks - cancellation only with consent from relevant stakeholders		

### Notes:

In line with SEPD's FN Governance Framework the SAVE project risks have been identified and assessed in terms of probability and impact. All risks are managed by identifying a risk owner and developing a series of controls designed to maintain risks within the accepted appetite for SAVE.

In addition to the control measures specified in the risk register and managed by the respective risk owners, key project risks have been specifically considered in order to develop contingency plans should management controls fail.

It should be noted that contingency planning is inherent to the risk management process adopted by SAVE. Specifically – as all risks are continually reviewed the relevant mitigating actions are modified to meet any change in severity or need. The contingencies identified below are updated during the risk register review process to keep both documents aligned.

Specific contingency plans have been adopted for all risks with MEDIUM or HIGH residual risk, with HIGH inherent risk. Contingency planning considers three timescales: 1) immediate actions, 2) interim measures and 3) long term recovery.

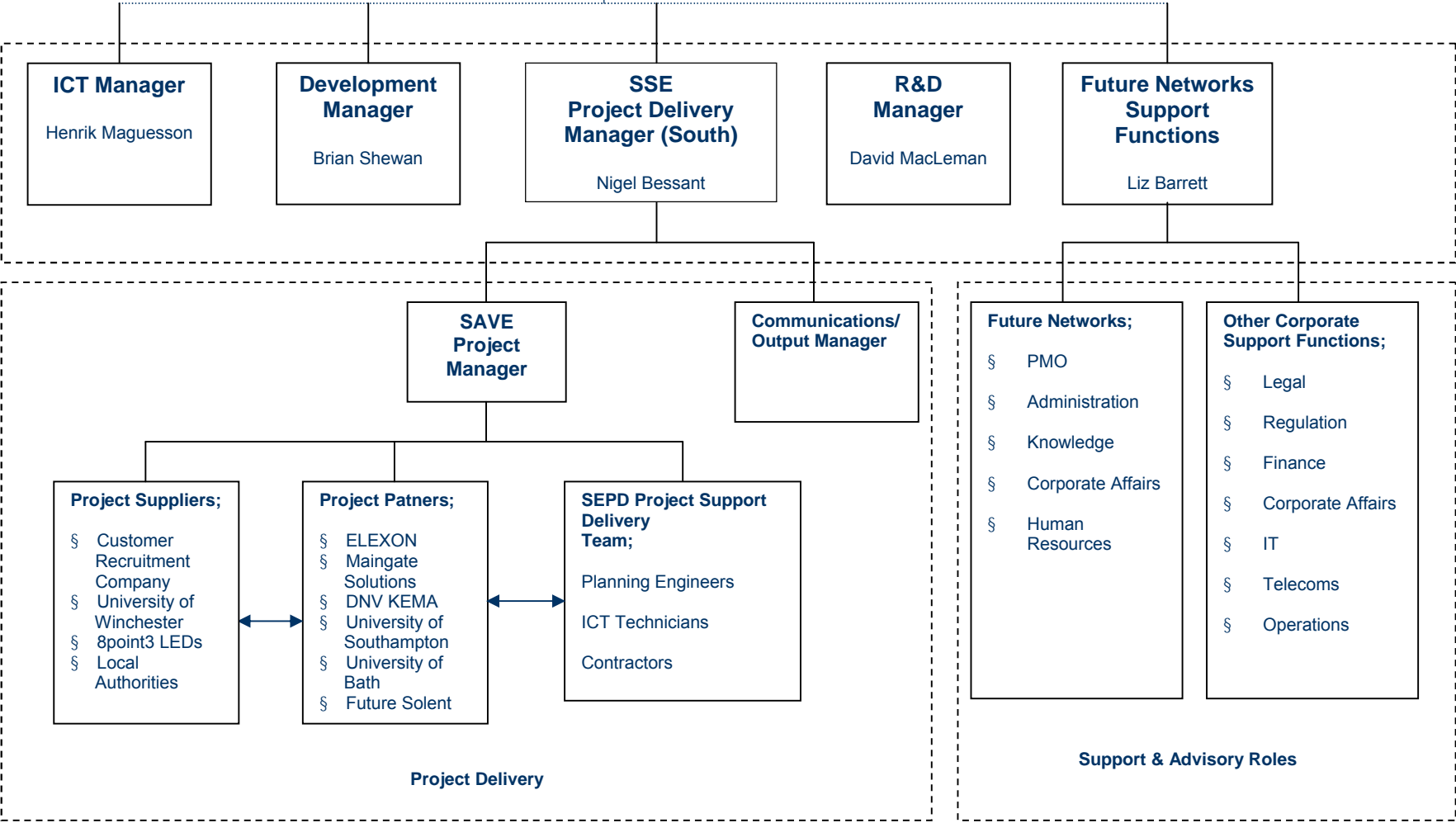
Naturally, the project plan, risk register and contingency plan are live documents and will continue to evolve as the project progresses.

**Appendix E**  
**Organogram & Roles and Responsibilities**

**Other Steering Groups**  
**Partner Review Board**  
**Technical Review Board**

**SSE Project Director**  
Stewart Reid

**Members of the SSEPD Innovation Steering Board**  
Networks MD  
Dir of Distribution  
Head of Finance  
Head of Engineering  
Head of Networks Legal  
Head of Major Projects  
Procurement Manager  
Strategy Manager SSE Telecoms  
Head of IT



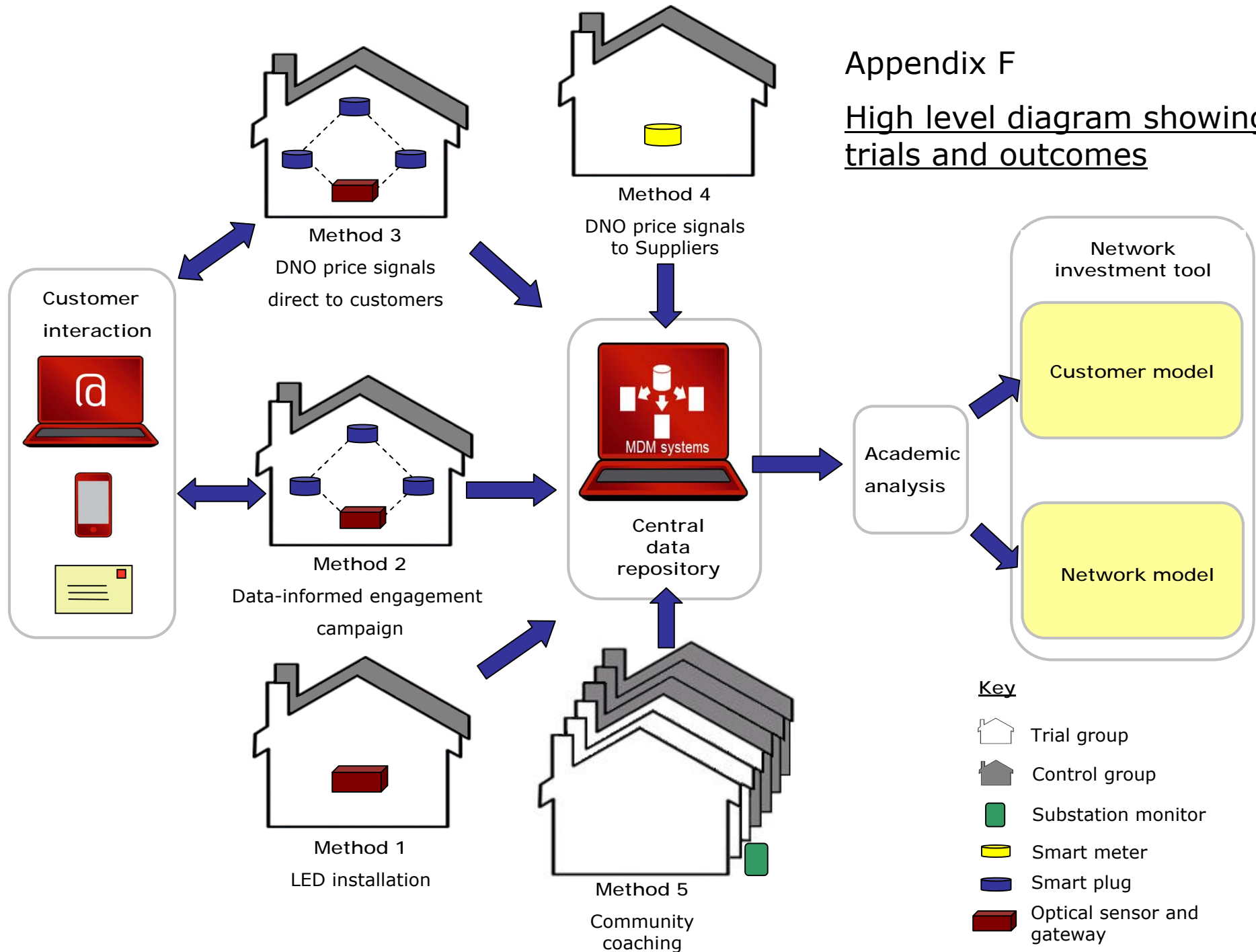
## PROJECT SAVE ROLES AND RESPONSIBILITIES

ROLE	RESPONSIBILITY AND ACCOUNTABILITIES
SSEPD INNOVATION STEERING GROUP	<ul style="list-style-type: none"> <li>• Overall responsibility for the delivery of the New Thames Valley Vision Project and other LCNF and Innovation projects;</li> <li>• Review and approve innovation bids;</li> <li>• Review and Approve funding;</li> <li>• Regularly review progress;</li> <li>• Major problem resolution;</li> <li>• Responsibility for project authorisation and approval, achieving the financial model targets.</li> </ul>
SAVE Project Director	<ul style="list-style-type: none"> <li>• Overall accountability for the successful delivery of the SAVE project;</li> <li>• Provision of leadership and direction for the individual project and feedback to the SSEPD Innovation steering group;</li> <li>• Accountable for project authorisation and approval, achieving the financial model targets</li> <li>• Responsibility for risk management and mitigation;</li> <li>• Primary external customer and partner company contact point.</li> </ul>
Project Delivery Manager (South)	<ul style="list-style-type: none"> <li>• Provision of leadership and direction for the delivery and partnership teams;</li> <li>• Delivery of legal documentation for asset transfer, and leases for the infrastructure;</li> <li>• COST: Responsible for delivering the agreed project scope to or better than budget;</li> <li>• PROGRAMME: Monitor performance against programme and achieve key milestones and handover dates;</li> <li>• SAFETY: Act as ambassador for the project, promoting a proactive culture at site level. Ensure all documentation is in place and to the requisite standard;</li> <li>• QUALITY: Handover of the agreed scope of works, completed to a high standard of workmanship. Monitor and maintain customer satisfaction;</li> </ul>

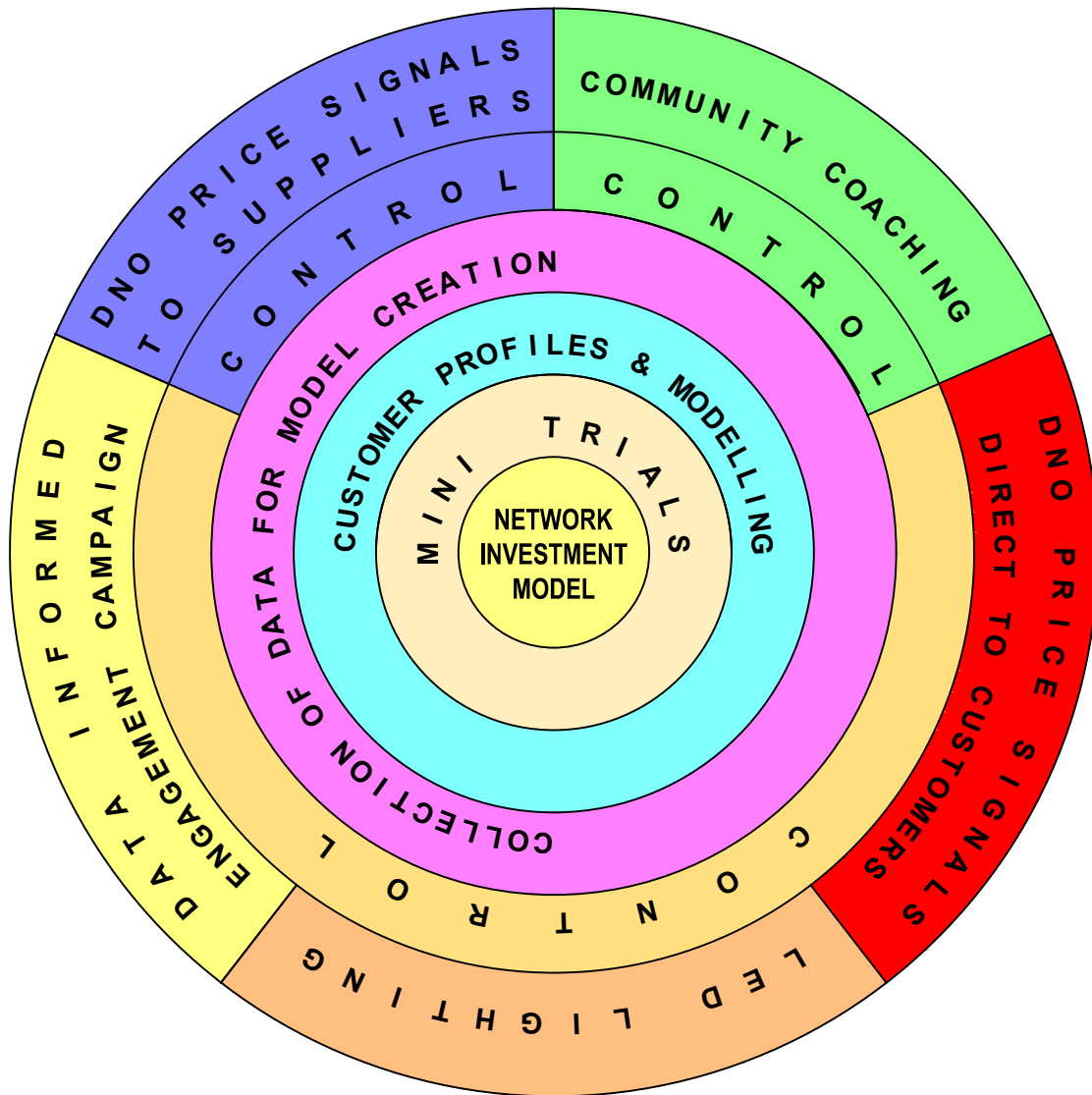
SAVE Project Manager	<ul style="list-style-type: none"> <li>• Responsibility for the day to day running of the project;</li> <li>• Procurement and coordination of services and interfaces, including Internal and External resources and documentation to achieve programme delivery;</li> <li>• Manage all Project Partners and Project Suppliers;</li> <li>• Provide all testing and commissioning resources;</li> <li>• Customer communication and progress feedback to Communications and Outputs Manager.</li> </ul>
Communications and Outputs Coordinator	<ul style="list-style-type: none"> <li>• Manage collection of project data and customer data;</li> <li>• Collect learning and communications from all parts of the trials;</li> <li>• Provide Communications/ Learning, Outputs support to the SAVE project team;</li> <li>• Coordinate Learning and Output sessions and reports;</li> <li>• Provide Communications/ Learning, Outputs support to the OFGEM Innovation team.</li> </ul>
Development Manager	<ul style="list-style-type: none"> <li>• Accountable for bid project authorisation and approval;</li> <li>• Responsibility for the project handover to the SEPD (South) Delivery team;</li> <li>• Providing support to the SAVE project team regarding on Partners, Partner Suppliers, OFGEM, Local Authorities, Future Solent</li> </ul>
ICT Manager	<ul style="list-style-type: none"> <li>• Project ICT Advise and Guidance to the SAVE project team;</li> <li>• Design the data and technology solutions for the SAVE project;</li> <li>• Advise team on best practices and new solutions in the design to achieve most economical solutions;</li> <li>• Ensure design complies with all relevant statutory and regulatory standards.</li> </ul>
R&D Manager	<ul style="list-style-type: none"> <li>• Provide advise and guidance on all things R&amp;D to the SAVE team;</li> <li>• Ensure best R&amp;D practices are followed;</li> <li>• Ensure Learning is captured for other parts of business and sector partners.</li> </ul>
PMO MANAGER	<ul style="list-style-type: none"> <li>• Provide the SAVE team with Finance, Legal, Procurement, Knowledge and Administration support.</li> </ul>

## Appendix F

### High level diagram showing trials and outcomes



## Appendix G SAVE model

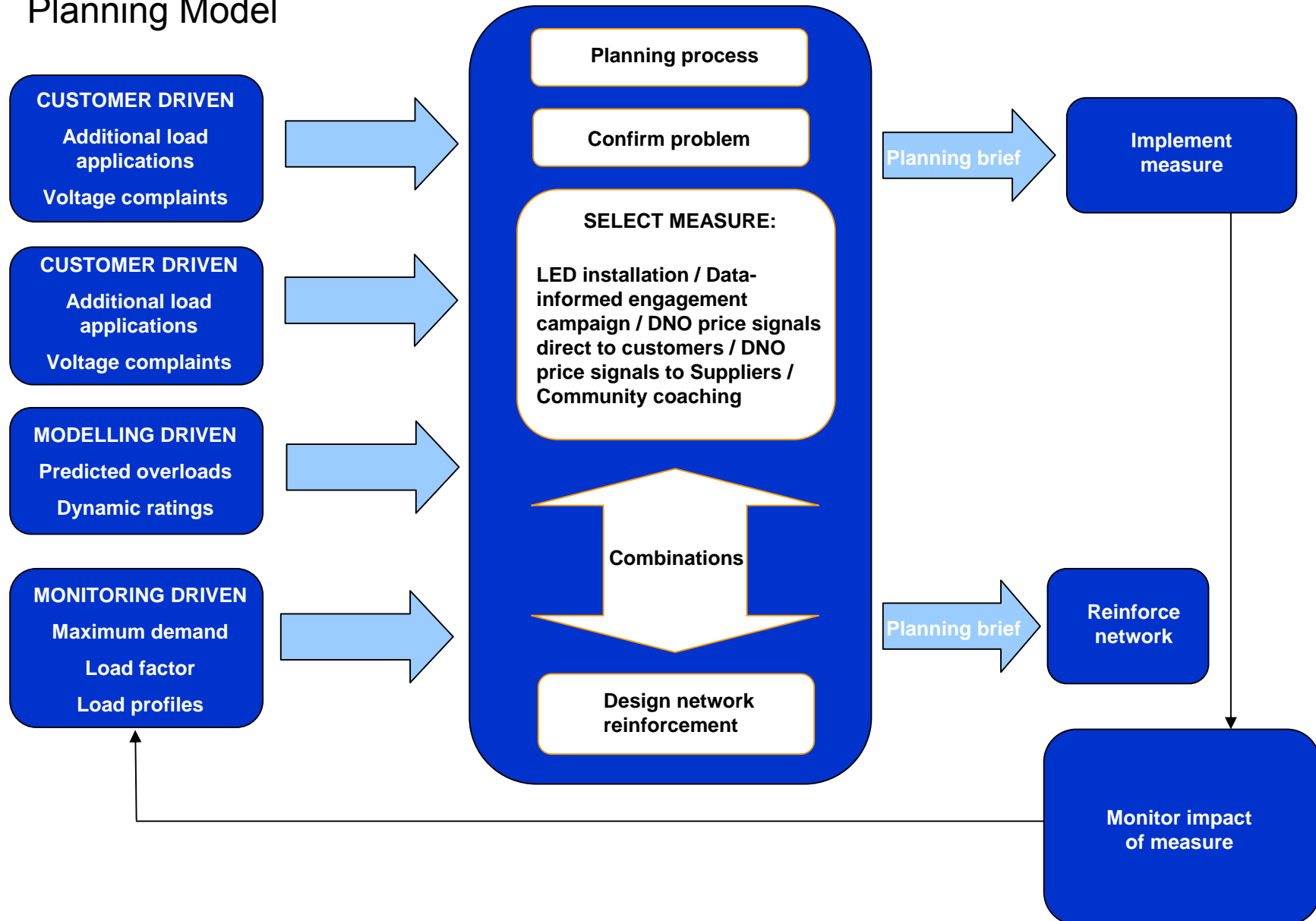


## THE SAVE MODEL



## Appendix H

### Planning Model



# Appendix I

## University of Southampton

### Sample Area, Size and Approach

---

Ben Anderson ([b.anderson@soton.ac.uk](mailto:b.anderson@soton.ac.uk))

AbuBakr Bahaj ([a.s.bahaj@soton.ac.uk](mailto:a.s.bahaj@soton.ac.uk))

#### Contents

1 .....	2
1    Sample Region .....	2
2    Justification of Sampling Approach .....	3
2.1    How best to conduct the trials? .....	3
2.2    Overall approach .....	3
2.3    Sampling process .....	4
2.4    Sample sizes .....	5
3    Proposed experimental trials .....	6

## 1 Sample Region

We have selected the overall Solent region as the target area for the study within the project. This will facilitate rigor and significantly improve potential impacts in both analysis and outcomes. The need for a larger region of study is based on the following premise:

1. If it is the case that the eventual 'network effects' model needs to be able to estimate the local 'impacts' of the intervention measures across all population groups and thus across all areas then we **must** have control sample and test samples which is representative of all entities in the Solent area.
2. If we assume that there are no specific 'living in the Solent region' effects (ref CLNR regional project findings?) then the dataset and the results can also be used to model effects across all DNOs.

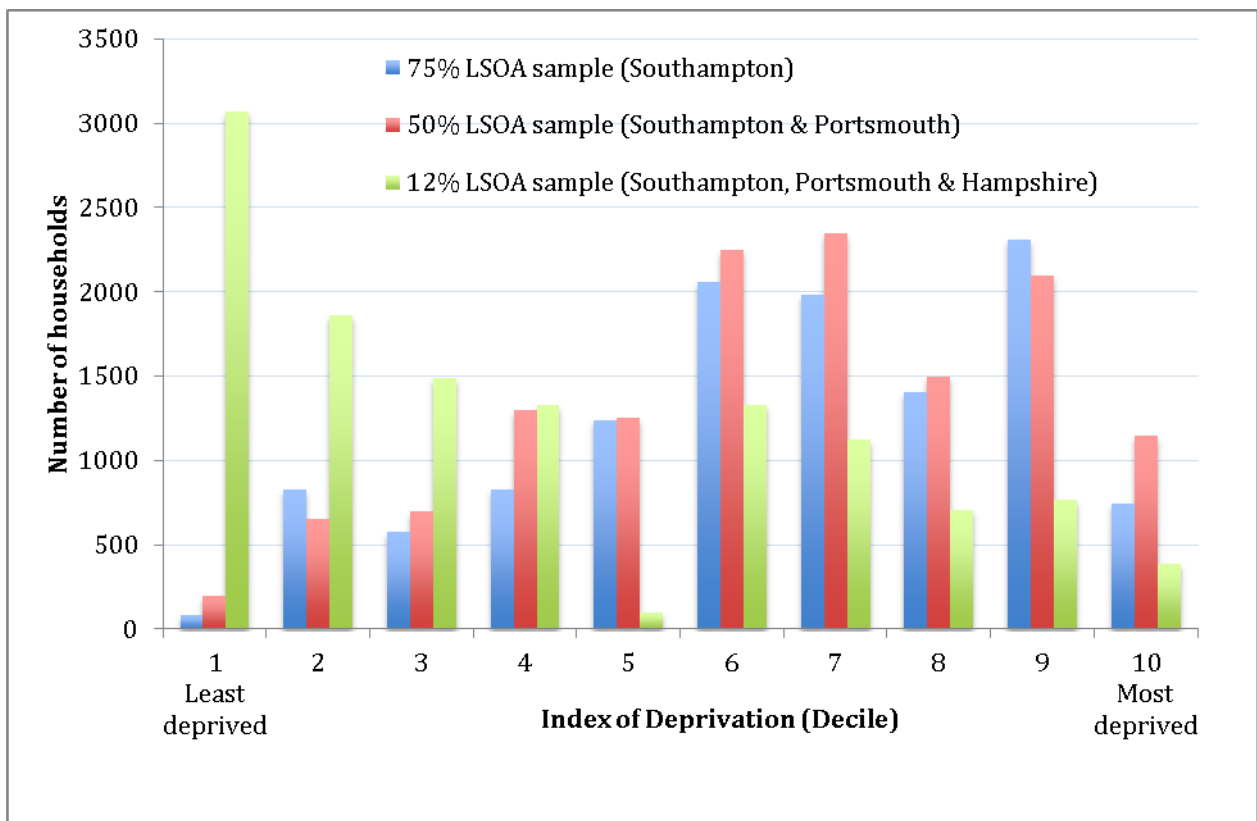


Figure 1: Distribution of exemplar 12,000 sample under different sampling area assumptions

This is clearly demonstrated by Figure 1 which shows the distribution of an exemplar  $n = 12,000$  sample across small area, known as the lower super output area (LSOA), deprivation deciles if; (i) we obtained the sample within Southampton, (ii) we obtained it in Southampton & Portsmouth and (iii) if we obtained it across Southampton, Portsmouth & Hampshire. Note that the size of the sample is irrelevant – it is the area it is sampled from that matters.

Clearly if we only sampled within the urban areas we would generate a sample which is predominantly from the deprived or very deprived areas and our model will be able to say very little about the kinds of people who tend to live in less deprived areas even though we know they tend to have higher levels of consumption and that they represent the greatest proportion of households in the region.

The same argument holds true for the recruitment of an SME sample – it needs to be representative of the Solent region if we are to (a) incorporate the intervention results into a Solent-wide model and (b) provide results which are applicable across other DNOs

## 2 Justification of Sampling Approach

### 2.1 How best to conduct the trials?

The project should commit to carrying out experimental trials/intervention/campaign tests of the highest quality in order to achieve the following objectives:

- distinguish between selection and actual intervention/campaign effects
- distinguish between novelty effects and longer term / permanent change
- be able to detect statistically significant effects and
- generalize the results to the general customer population

Further this approach will provide:

- a key differentiator for the proposed project against competitors and existing running LCNF projects (e.g. Customer Led Network Revolution)
- justification for LCNF funding as the level of research investment than could normally be risked by the industrial and other partners

### 2.2 Overall approach

To achieve the above objectives the trials should take the following form:

1. Recruitment of a representative random sample of size n (see below for sample size discussions) via:
  - a. a structured sampling process (see below)
  - b. a face-to-face household survey to establish socio-demographics, appliance ownership, heating and hot water systems and energy-use habits etc
2. Initiation of baseline energy use data collection for 6 months prior to any intervention/campaign via:
  - a. (Ideally) existing or newly installed smart meters
  - b. (not ideal) linkage to regular customer meter readings/billing records
3. **Random allocation** of sample households (or 'streets') to equal sized control and intervention groups<sup>1</sup> using a factorial design.
4. After 6 months: start intervention/campaigns
  - a. Must begin at the same time to avoid seasonality problems (?)
  - b. Must be appropriately chosen so that season is not a confounder (e.g. if main focus is winter evening peak, do not implement intervention in spring/summer!!)
5. Continue automatic data collection (Smart Meters) for whole sample (control + intervention)
6. After a minimum of 12 months (i.e. after at least 6 months of intervention/campaign iteration I)
  - a. Repeat household survey to establish any changes to habits, appliances, socio-demographics and check same occupants etc. Could be implemented as an online survey to save costs but beware:
    - i. Mode differences

---

<sup>1</sup> See <https://www.gov.uk/government/publications/test-learn-adapt-developing-public-policy-with-randomised-controlled-trials> for a useful summary of this approach

- ii. Non-response in less well off & elderly households due to lack of effective internet access (ref CHARM project)
    - iii. House-movers need to be accounted for (followed?)
  - b. Iterate interventions but beware:
    - i. Ordering effects of interventions?
- 7. After a minimum of 18 months (i.e. after at least 6 months of intervention iteration II):
  - a. Repeat household survey
  - b. Iterate intervention but beware:
    - i. Ordering effects of interventions?

This process could be iterated again but this might take the study outside the project's permissible duration. However the study should be conducted in such a way that further study – e.g. continuous collection of smart meter data and repeated surveys etc can be continued (open ended permissions and consent for re-contact)

We should allow 6 months before the sample recruitment for:

- the development of the research methods
- the development of interventions
- piloting of the data collection methods

We should allow at least 6 months after for final data analysis, reporting etc

This produces a project timeframe of 30 months (2 iterations) or 36 months (3 iterations) but:

- We should allow for project start-up and especially sample recruitment and baseline data collection to take longer than expected (up to 12 months to establish).
- We need to allow sufficient time for analysis of data to underpin intervention iteration/redesign

These may prevent 3 iterations within the 36 months.

## 2.3 Sampling process

Assuming the focus is households the only effective way to generate a representative random sample sufficient for our analytic needs is to use a randomised stratified approach to sampling which has the following steps:

1. Stratify census areas (LSOAs or OAs) in the region by deprivation quintile & urban/rural location (for example);
2. Randomly select n census areas in each strata - ideally some of these would match to the DNO's constrained network areas but this should not be a design constraint as it will lead to a biased sample;
3. Randomly select addresses from these areas from the Postcode Address File;
4. Work through addresses until overall required sample size achieved & baseline survey completed.

The last two actions and the follow-up surveys (see above) are probably best done by a subcontracted market research company?

### 2.3.1 A case based approach

An alternative approach would be to identify 6 areas which are either sufficiently heterogeneous to be able to meaningfully represent the wider population or are sufficiently homogenous that they all represent a particular socio-demographic group. Random samples within each area could then be drawn in a similar manner to that described above. Randomisation could also occur at the street or area level.

The main drawback of this approach is that the initial selection of areas will introduce unknown sources of bias to the sample. This might include:

1. A skewed socio-demographic profile and thus a high likelihood of omitting customer/household types of interest
2. A tendency (accidentally or otherwise) to select areas with a particular energy usage profile
3. A tendency to select areas potentially more amenable to 'change'
4. A tendency to select areas who have already undergone interventions of some sort

Any of these effects would substantially reduce the validity of the results and in particular the degree to which the study could generalize its findings beyond the particular cases studied.

## 2.4 Sample sizes

The size of effect we are likely to find dictates the required sample size.

Data to hand (electricity monitoring on c 300 households over 18 weeks in March – June 2011): mean kWh per day  $\sim$  11.30852 sd  $\sim$  5.643383

We can use this with a sample power calculator to estimate n required...

Assumed size of effect:

- 5% reduction in mean kWh per; effective n required  $\sim$  2000 EACH for control and intervention samples – so total n = 4000
- 7.5% reduction; effective n required  $\sim$  1000
- 10% reduction; effective n required  $\sim$  550
- 20% reduction; effective n required  $\sim$  150

### What can we assume about effect sizes?

The other LCNF results for time of use tariffs<sup>2</sup> have suggested c 7% overall reduction with a c 14% reduction during the peak tariff period. The Charm project suggested 2.5-5% depending on intervention condition.

We also need to allow for up to 15% attrition (dropout) through the data collection period due to non-response, refusal (withdrawal) and untraceable house movers.

This implies that an initial effective sample size of c. 2000 for each control/condition (separately under a randomized control trial (RCT) type approach) will be needed if we assume an effect size of 5%. If we assume an effect size of 7.5% then we can reduce effective n to 1000 each. The latter will be used as it will be within discussed budgets

However rather than implementing an RCT type approach where each intervention sample is kept strictly separate, we propose a factorial design. In this approach the effective n required is distributed across the intervention groups and interventions are combined for some groups. This is explained below.

Table 1 shows the sample size required if each intervention is kept separate. We would require n = 4000 households to be recruited.

**Table 1: RCT approach – each intervention group separated**

Intervention group	Required n
Engagement + smart plug	1000
LED	1000
DNO ToU + smart plug	1000
Control	1000
Sum:	4000

<sup>2</sup> See <http://www.networkrevolution.co.uk/industryzone/projectlibrary/learning-outcome-2-results>

Table 2 shows the effect of a factorial design. In this case the intervention samples are split into groups of 250. 3 groups receive a 'pure' intervention whilst the others receive combinations of interventions. We maintain 1000 as a control group.

If all of the intervention sample who receive 'Engagement' or 'Engagement &...' are summed we find the effective n for this intervention is 1000 (see right hand columns of Table 2). This is true for all interventions. Thus we maintain the required effective n for each intervention at 1000 but as the left hand side of Table 2 shows we only need to recruit 2750 households.

**Table 2: Factorial approach –intervention groups combined to allow all combinations but maintain effective n of 1000 for each single intervention**

		Actual n		Effective n
Pure intervention	Engagement	250	Sum of all with 'Engagement'	1000
	LED	250	Sum of all with 'LED'	1000
	DNO ToU	250	Sum of all with 'ToU'	1000
Combinations of interventions	Engagement + smart plug	250		
	DNO ToU + smart plugs	250	Control	1000
	LED + engagement	250		
	DNO ToU + smart plugs + engagement	250	Sum (effective)	4000
	Control	1000		
	Sum (actual)	2750		

This has the advantages of:

- Enabling analysis of combinations of interventions such as Time of Use tariffs AND demand-shifting plugs as well as each on their own
- Reducing the required sample size (and thus costs) whilst maintaining effective sample size and thus statistical power since all that is required is for the effective sample size across the interventions to be greater than or equal to the size required for the effect we wish to detect – i.e. effective n of 1000 to detect an effect of 7.5%

The only disadvantage is that multivariate analytic techniques will be required to tease out the effects of the different interventions but this would probably have been the case even with an RCT design.

Thus if we are content to assume an effect size of 7.5% then a factorial design means that we could recruit an effective n of 1000 per condition which would mean recruiting only 2750 households across the Solent region.

### 3 Proposed experimental trials

1. WP5: Time of Use Tariffs and Incentives – consumer sample 1
2. WP6: Task 6.1 - Customer Engagement – consumer sample 2
3. WP6: Task 6.2 – Engagement + LED light replacement & demand shifting through smart plugs - consumer sample 3

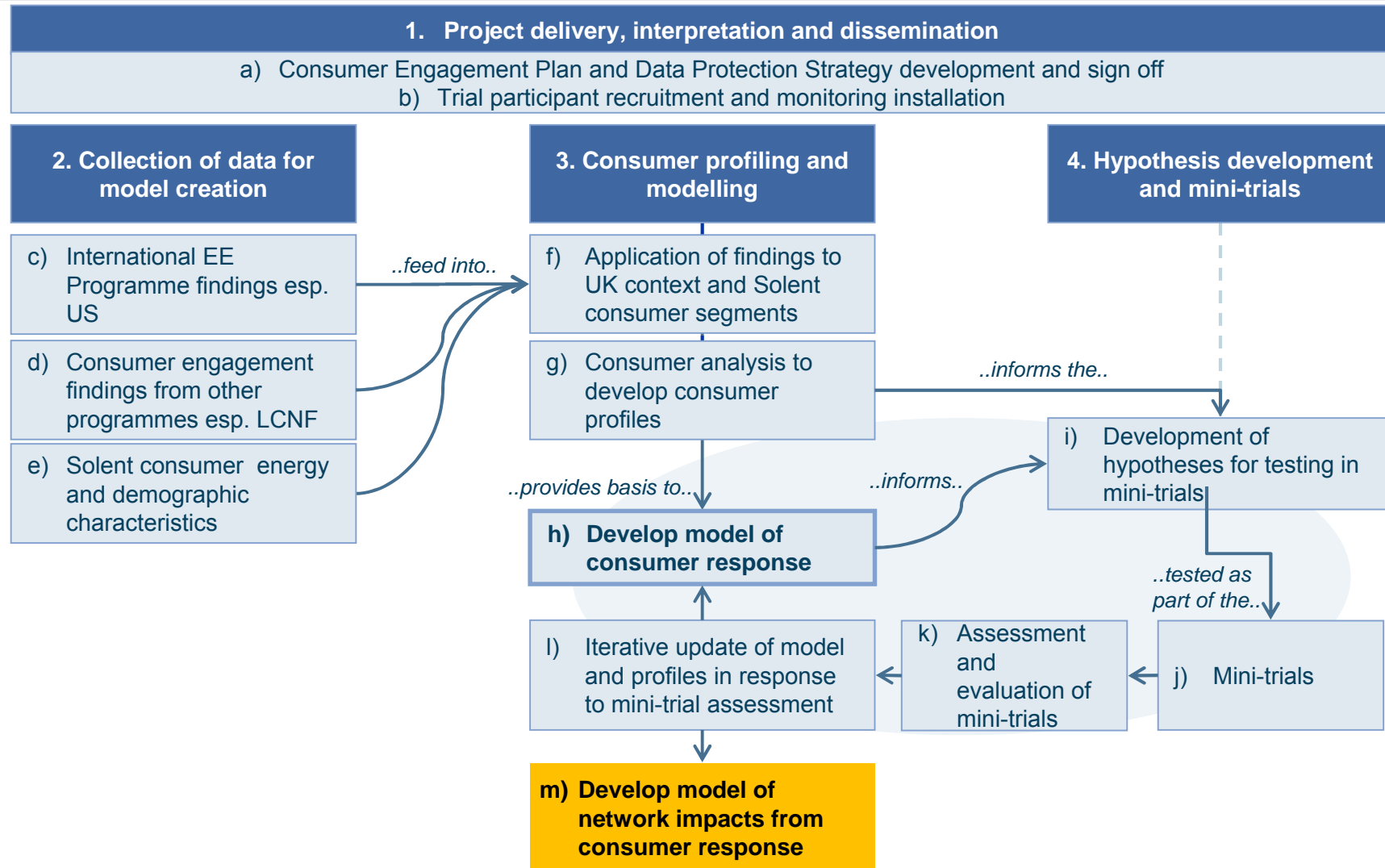
Trials 1-3 require a 'no touch' control sample which we will be label as consumer sample 0.



For costing purposes we need to assume that all consumer samples require:

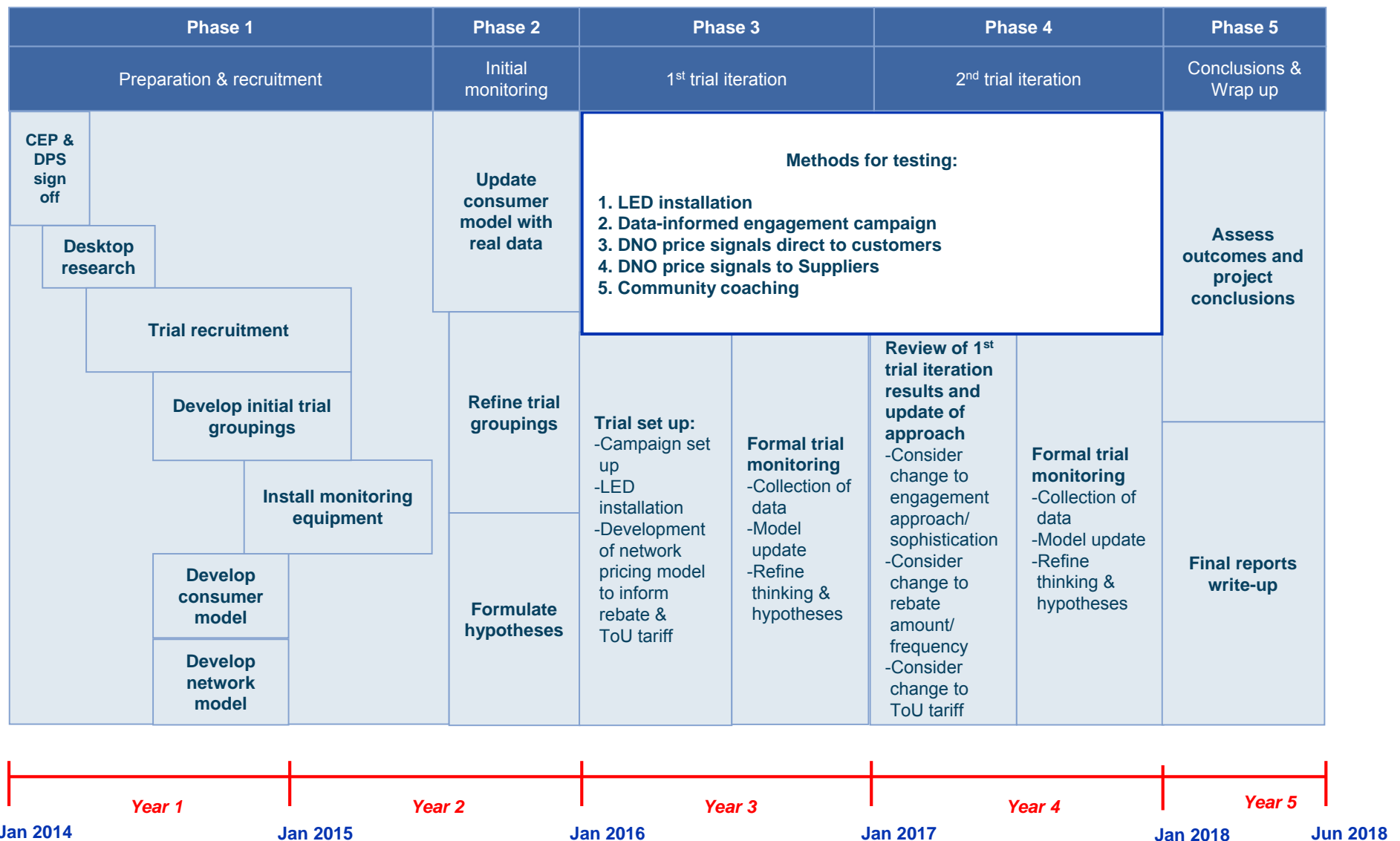
1. Initial recruitment and basic household survey
2. Installation of some form of data logging/smart meter if MPAN linkage to ELEXON data is considered insufficient
3. Collection of baseline data for up to 6 months on all samples
4. Continuous monitoring on all samples during the intervention phases
5. Potentially follow-up surveys during the intervention phases
6. End of trial/control group survey

# Appendix J High-level project concept



**Basic assessment criteria: £/KW and £/KWh saved as a result of the method trialled**  
**Looking for both immediate and persistent effects**

## Appendix K Project phasing diagram



## Appendix L Maingate proposal

### 1 – Maingate

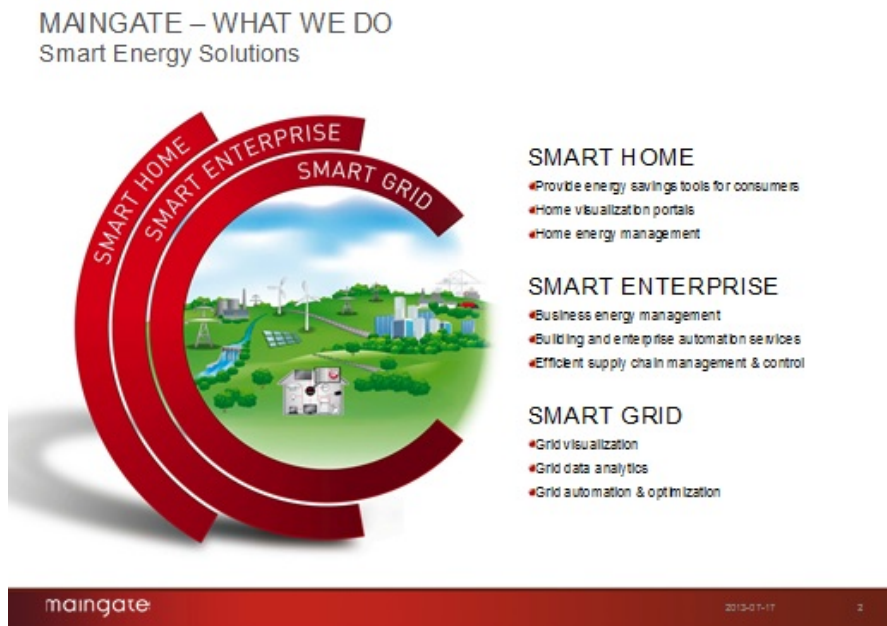


Figure 1 – Maingate Overview

Maingate has significant experience across the Smart Grid, Smart Home and Smart Enterprise and works with over 300 utilities daily, connecting almost 8 million energy users in real time. This is in addition to the 1,000+ industrial clients and our activities in the connected residential security and mobile payment gateway sectors. Maingate currently connects:

- 55% of all smart meters in Sweden
- 20% of all smart meters in Finland
- 70% of all mobile payments terminals in Sweden
- 40% of all residential alarms in Sweden

Our solutions enable a real-time overview of the energy consumption as well as access to historical data. The solution allows for user interaction, information management and device control.

#### VISUALISING ENERGY CONSUMPTION

Maingate's user interface, called UX, is straightforward and easy to use. Users access the system through any browsing device where they can look at the visualisations, analyse, compare and take actions on energy savings. Connections to social media help the customer (should they wish to) spread awareness of energy consumption (users are able to post their own data to enable friends/family to view and compare usage).



#### MANAGING CONSUMPTION DATA

Maingate gather all energy consumption data in a cloud-based solution called mVio, which supports information management and integration to other systems as well as data analytics and reporting.



## EQUIPPING A SMART SOLUTION

Maingate provides hardware products measuring and collecting energy consumption data and ensures reliable and secure connections between devices and information management systems. An optical reader can be installed on non-smart meters. Smart plugs measure energy consumption on specific appliances or groups of appliances and can be used to switch them on and off. Thermostats are used to monitor and control the heating. The collected data is sent through a home gateway to Maingate's database. The visualisations are available through any browsing device.



Our focus is to develop customised energy solutions, based on our clients' specific requirements. Based on our capabilities and systems for Information Management, User Interaction and Device Access & Control, our energy solutions will benefit both our clients' end customers and their operations.

## 2 – Previous Projects

Maingate has established itself as a key partner in several high profile projects within Europe, with similar solutions and aims as those being trialled in the SAVE project. Maingate brings both knowledge gained from these trials as well as the technological capability to ensure that the trials can run with the levels of integration and data granularity required to prove the effectiveness of any methods being tested.

Examples of past projects include:

### 2.1 - E.ON, Sweden – Energy Visualisation and Customer Engagement

The concept is a real-time visualisation of energy consumption, which E.ON offers to the market under the name "100koll" (approx. 100% control). The concept gives consumers the ability to follow their consumption in real time and thus be able to influence it in order to lower their use, cost and environmental impact.

"Consumers must understand and be involved. For this to happen we need flexible tools that help consumers to understand the energy system and by doing so we'll get more active customers. The 100koll project is a first step in making the customer more aware" says Mr Anders Olsson, member of Executive Management E.ON Nordic.

The idea with the 100koll concept is to give consumers direct knowledge about their consumption, as close as real-time as possible. The knowledge is accessible in real time via any internet-enabled device.

"We believe this knowledge will lead to more active choices being made and that people will be able to identify unnecessary consumption and better understand the connection between consumption and cost", says Mrs Karin Rådegran, Project Manager 100koll, E.ON Retail.

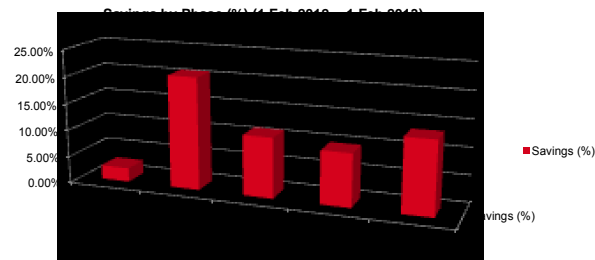
The 100koll solution has proven to reduce energy consumption with an average of 11% in total during the pilot period and a high of more than 20% during specific active periods.

The table below shows actual results from a marketing campaign run by E.ON that supported the 100Koll project.

## MARKETING HEAVILY ENGAGED

5 Phases to programme:

- Economy
- Challenge
- Reward
- Reminder
- Empathy



- 20% peak savings, 11% overall
- Forecast electricity bill = £650 X 11% = £71.50 p/y



Figure 2 –Energy saving per phase.

Surprisingly, the idea of saving money yielded savings of around 5% yet challenging consumers, through peer or individual targets, yielded 20% in energy savings.

An example of how this approach was applied to individual consumers is the case of Lotta, a 29 years old single-occupancy householder. By combining the energy data produced through Maingate's solution with the customer data held by the utility, it was identified Lotta used as much energy as a multiple occupancy household. This gave the utility an opportunity to work with Lotta to educate and inform. The result of this was a reduction in energy consumption of over 70% and the utility now had a trusted relationship upon which they could start to offer new, chargeable, services to Lotta.

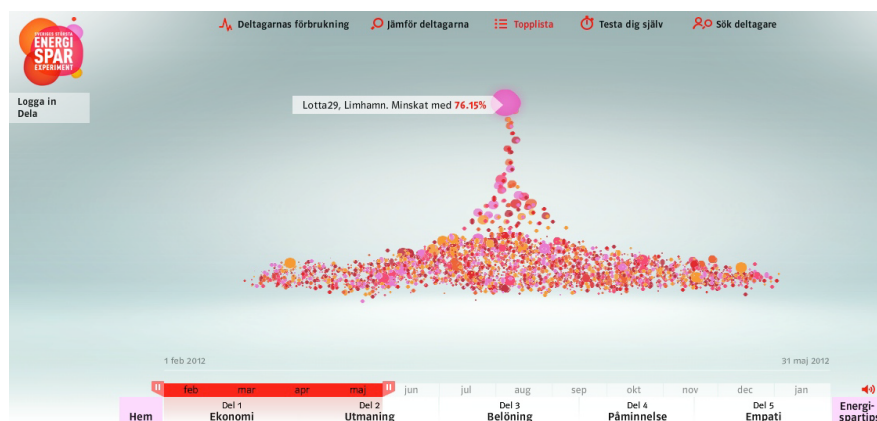


Figure 3 – Eon trial data – As can be seen, Lotta's consumption is considerably higher than the average for her peers.

Overall, this campaign is a classic example of the key stages to get a utility and customer from engagement to commercialisation:

- Improving the relationship consumers have with energy:
  - o Energy ignorance
  - o Energy engagement
  - o Energy reduction
- Deepening the relationship and trust between consumer and utility:
  - o Proactive communications with consumers to reduce energy consumption
  - o Reducing energy spend

- Helping consumers be as efficient with energy as possible
- A platform for new services that capitalises on the deeper, more trusted relationship:
  - Control of home devices
  - Automation and remote steering of home devices
  - Recipes/Scenarios to combine different data sources to provide a better, cheaper lifestyle for consumers

We are now working with E.ON to implement the platform for new revenue-based services.

## 2.2 - JM – one of Europe's largest social housing providers

Maingate provided real-time energy feedback in to the consumer's home. Using real-time data to compare one home against similar homes in the programme, users were alerted through red and green LEDs whether they were on par with their community, or using more energy.

With such as simple consumer interface, energy consumption across the community reduced by an average 12%, peaking at 17%.

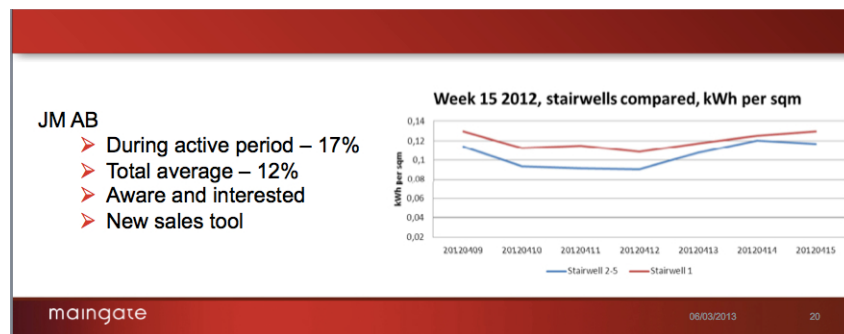


Figure 4 –Energy savings/consumption per period.

## 3 – Technology

The uniqueness of the Maingate solution is that it encompasses all aspects required from an end to end perspective with regard to the user experience, as detailed in the below high level diagram

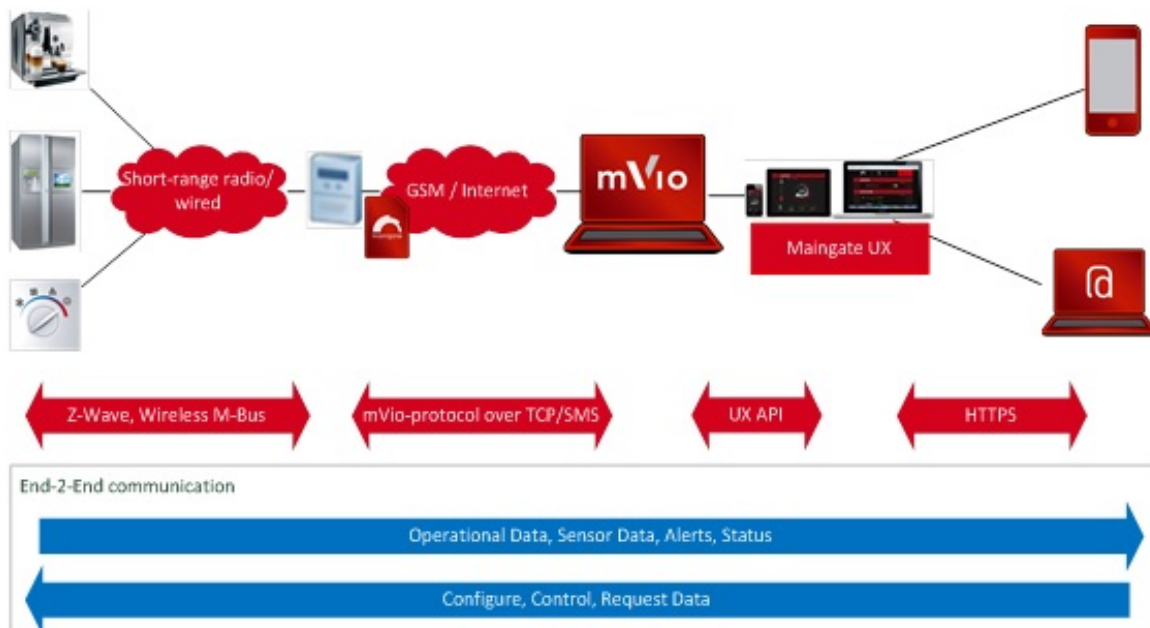


Figure 5 – E2E Coms Overview (excludes 3<sup>rd</sup> party integration)



The main components of the solution are:

- **Sensors and Actuators** – These are hardware components located on the premises that record respective data. The sensors each communicate with the Gateway in order to transmit the data to (and depending on functionality receive commands from) the mVio system. Below are examples of both smart plugs and optical sensors being used within the trials.

- **Smart Plugs**

Maingate has been providing pioneering solutions for monitoring and control of energy use for over a decade. In doing so, we have deep experience in sourcing and developing products to seamlessly integrate with an end-to-end solution, at the same time as giving consumers a great experience.

For appliance monitoring and control we integrate the Aeon Labs Smart Energy Switches:

With an unobtrusive small form factor, the Smart Energy Switch will not block other nearby AC sockets; it will report immediate wattage energy usage or kWh energy usage over a period of time using Z-Wave communications protocol.



- **Maingate Gateway** – The Gateway is also located within the premises and connects via a broadband router in order to communicate with the mVio system. The Maingate Gateway is currently able to support

communication via the following standards:

- Ethernet
- Z-Wave
- wMbus

As the Gateway is able to support communication via various standards, this ensures that the solutions in place are not only flexible, but they are also scaleable (as additional devices can be included as and when required), and as the standards preferred are open, maximum interoperability is assured. The recommended Gateway is designed by Maingate and built by Gemalto, one of the world's biggest technology manufacturers and also a strategic partner of Maingate.



Maingate Gateway.

- **mVio** – Is the hub of the solution, and provides not only a data source for the aggregation of all data obtained but, the ability to integrate with third party data sources as well as offer API's to external trusted parties enabling data access. The below diagram illustrates not only mVio functionality, but internal and external integration points.

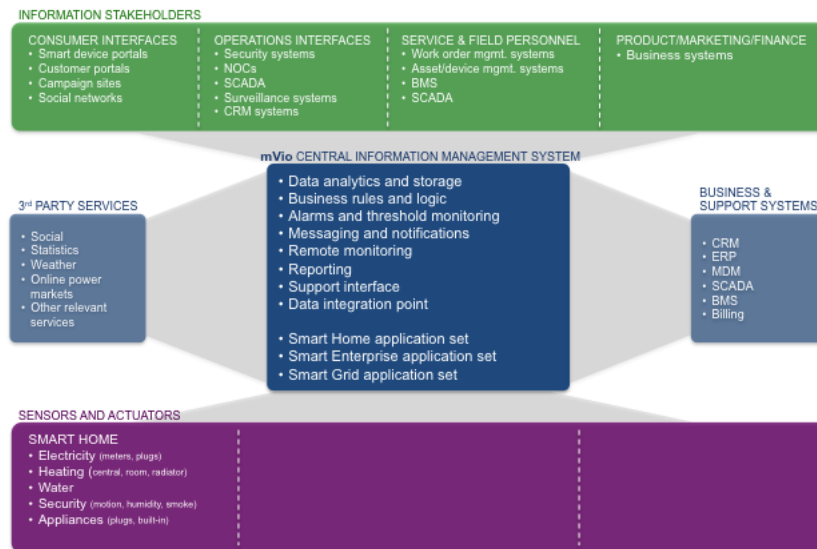


Figure 6 – mVio as the hub of the solution

As can be seen from the above, the mVio suite provides a central data source for any stakeholder to connect to as well as having the ability to perform data analytics and reporting. mVio is also capable of integration with 3<sup>rd</sup> parties to obtain data via feeds, this can range from usage data (e.g. via head end systems) to weather forecasts utilising many common formats e.g. XML).

mVio is hosted on a secure cloud platform which is both cost effective and highly scalable and ensures that as such, initial costs can be kept to a minimum and increased in line with rollout/demand. mVio is a proven and stable platform that currently handles almost 8m energy user's data, securely managing access rights to various stakeholders including operations, marketing, consumers etc. In addition to this, mVio handles secure transaction data and provides stable services across 43 countries.

- **Maingate UX** – The Maingate UX allows access to not only real time data usage, but historical and projected usage based on information obtained from mVio and integrated sources. The UX provides a clear visual representation of not only total energy usage, but individual breakdowns of feeds obtained from the premises (i.e. from sensors and actuators).

Example screenshots of the UX can be seen below detailing some of the display options available to the end user:

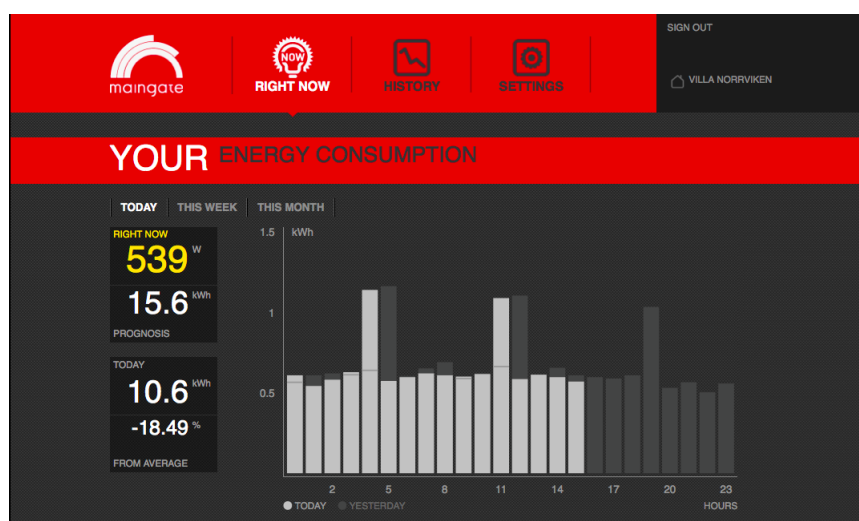


Figure 7 – Current Usage (light grey current, dark grey historic/not yet available)

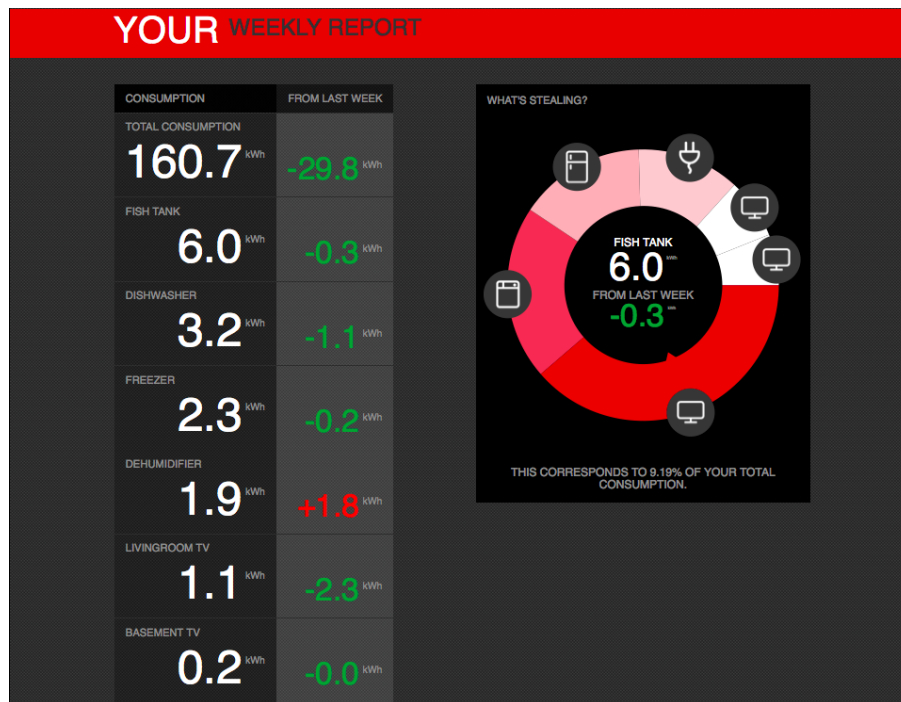


Figure 8 – Current Usage (with sensor input display)

#### 4 – Solution Overview

The intended solution for the Save project consists of the following elements which fit in with the Maingate solution detailed within section 3 (figure 5), and consisting of the following components:

- Maingate Gateway – This will be installed in every home and connect via the homes ADSL router.
- Power Reader – This is an optical sensor capable of reading consumption from both mechanical and solid state meters. Power readers will also be installed in every home.
- Smart Plugs – Homes taking part in the Engagement trials will receive Smart Plugs to allow them to visualise and monitor their energy usage effectively (as shown in Figure 8, above).

The above hardware is easily installed by the end user, and comes with both comprehensive installation instructions and support. This installation method has been used successfully in previous trials, and will help not only simplify the rollout process within the SAVE project, but help in cost reduction (as home visits would be minimised).

In addition to the physical equipment being used within the solution, both mVio and the UX will be utilised:

- mVio – All data will be securely fed in to mVio as the data hub, either via the Gateway directly in to mVio, or via integration to head end systems (e.g. CGI via XML) to obtain read data from smart meters. All data will then be collated and presented to external parties in the same format to allow required data to be extracted. Any extracts will take place via secure API's presented by Maingate.
- UX – Given that the UX is tried and tested, with various visualisation methods (web/smartphone) it is envisaged that this will be utilised to display the data in a common format to all trial participants (other than the control group).

For detail on both upstream and downstream integration please refer to the dataflow diagram detailed within the main section of the proposal document.

##### 4.1 – Data Feeds

As mentioned above, all data will be fed in to mVio there will be several data feeds, as shown in the following diagram.

## SAVE – Usage Data Flow

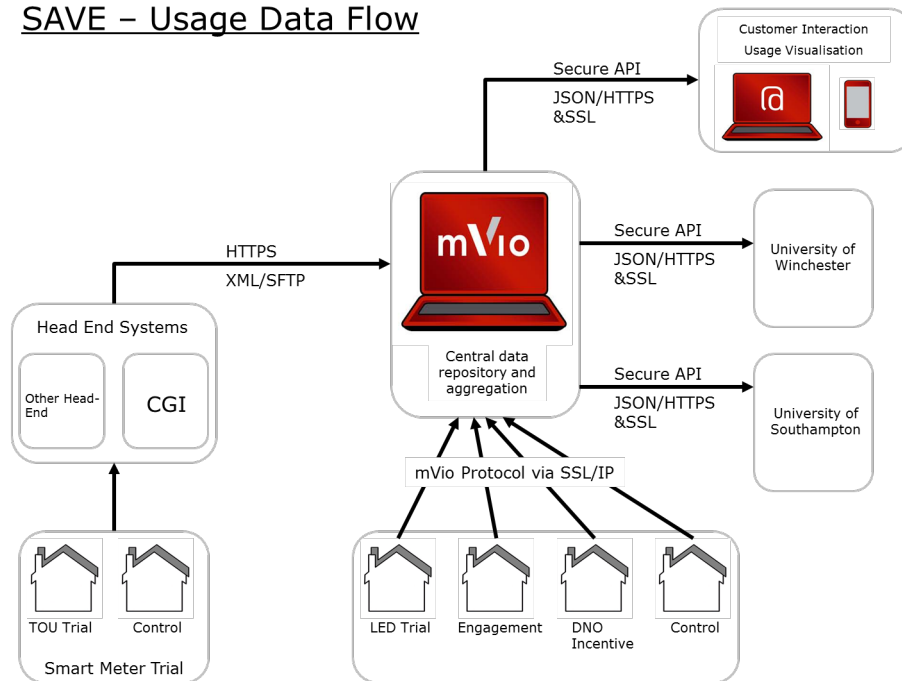


Figure 9 –SAVE data flows and mechanisms.

mVio is able to accept data in various formats for ease of integration, however for the SAVE project data will be transferred to trusted (authorised) parties using the following standard methods:

- XML Files via SFTP
- Restricted APIs (using access control, and authorisation to ensure data privacy using JSON/HTTPS&SSL)

Both of the above methods ensure that data security and privacy are ensured whenever data is either received in to mVio, or sent to trusted parties (e.g. authorised Academia). Although mVio will be the hub of all data feeds, mVio will not hold any personal data. All consumption data will have a customer/trial ID associated with it (an ID unique to the trial). This approach simplifies the process of removing data should any participant leave the trial.

## 5 - Security & Support

As previously mentioned, Maingate currently has both trials and long term solutions in place for various high profile clients dealing with highly sensitive data. To ensure the security of the data, continued client confidence, and regulatory adherence, Maingate has tight security protocols in place. An outline of the solution security can be found below, with all solutions regardless of scale adhering to the same policies and standards.

### 5.1 Security

All customer connections to Maingate are protected by controlled firewalls at all times. The access net at Maingate is considered a DMZ "De-Militarized Zone", it is not as exposed as the real Internet but it is connected to the Internet via firewalls. Only users that are authorised via Login/Password mechanism are authorised to access mVio.

Maingate uses firewalls in two different levels. The first level of protection is the firewall connected directly to the Internet; this is where most attempts are made to attack the network. The second level of protection comes from the firewalls connected between the access net and the systems net.

### 5.1.1 Physical Security

The physical security of Maingate is based on redundant server systems with geographical dispersion. Maingate system components are placed in a Telco security grade server room in Sweden.

This server room is:

- Telecom certified.
- Fully manned 24/7 security.
- Redundant power – UPS and diesel generators.
- Fire protected.

### 5.1.2 Data security

The measurement data is stored in a noSQL cluster. The data in the cluster is automatically replicated to multiple nodes for fault-tolerance. Failed nodes can be replaced with no downtime. All data is also backed up.

The data is stored in a relational database. The data in the master node is replicated to a hot standby node. All data is also backed up.

### 5.1.3 Information security

The device management system is able to handle multiple enterprise customers. The data in the system is stored in a hierarchical structure where users only can traverse from their own root position; i.e. you can't access data above your own level in the structure, and ensuring that users can only access data that they are authorised to view ensuring security and separation.

An enterprise customer would login with a unique login to be able to access their end users. An end user must login with a unique login to be able to access their data.

### 5.1.4 Application security

All API request are performed in atomic transactions - if something goes wrong during a transaction all calls within the failed transaction are rolled back.

### 5.1.5 Network security

All calls through the user interface API are encrypted with SSL. The calls pass a firewall before they execute in the DCS.

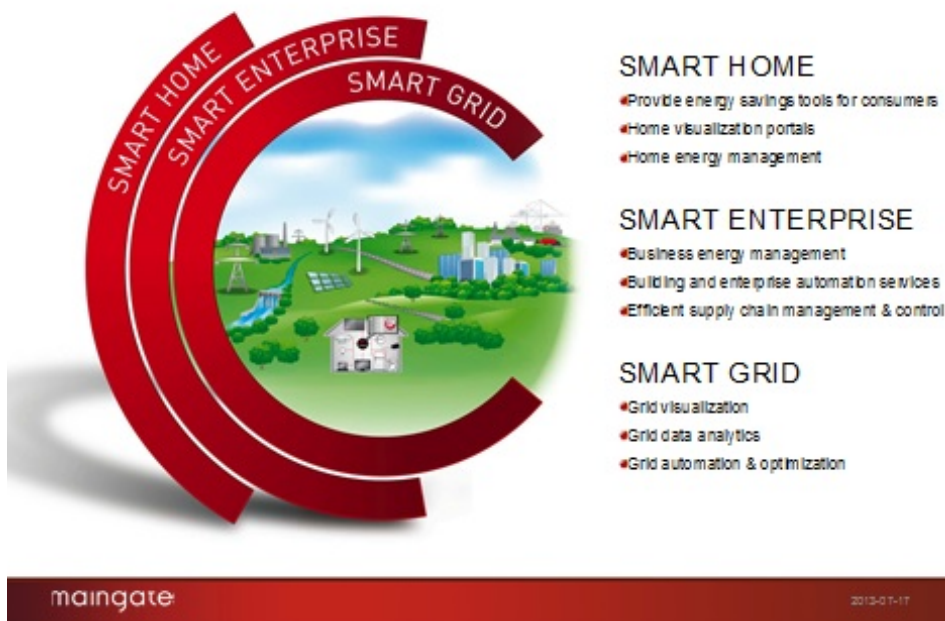
- Calls between the Enterprise service bus and the device management system are unencrypted.
- Calls between the Device Communication Server and the Enterprise service bus pass through a firewall.
- Calls between the Gateway device and the DCS are encrypted with SSL and challenged by the DCS.
- The calls go through an internal firewall on each node of the cluster.

## 5.2 Support

Maingate has an existing support mechanism in place for current solutions including supporting trials and enterprise customers, this ensures the smooth running of all current operation solutions and trials. This same mechanism will be utilised for the support of the SAVE project.

## MAINGATE – WHAT WE DO

### Smart Energy Solutions



Maingate has significant experience across the Smart Grid, Smart Home and Smart Enterprise and works with over 300 utilities daily, connecting almost 8 million energy users in real time. This is in addition to the 1,000+ industrial clients and our activities in the connected residential security and mobile payment gateway sectors.

Maingate has been involved in various similar high profile projects within Europe, and brings the learnings from these projects combined with the proven track record of smart grid, enterprise and home. Maingate has experience of trials with various partners including suppliers such as E.ON and Vattenfall as well as projects with other partners such as housing associations (JM).

The solution proposed for the save project involves both hardware and software elements to enable accurate measurement and recording of energy usage. Optical sensors will be used to accurately record usage, which will then be sent to Maingate's mVio system which will act as a core central data store. mVio will take feeds from the Smart Meter Head-End Systems and aggregate this with other trial data sources ready for collection by the downstream systems (Acadmia) for analysis. Control groups will merely have energy usage recorded, whereas other groups will also have smart plugs to allow a more granular level of usage measurement. All usage information will be transmitted to the mVio system via a gateway within the customers home (as shown in section 3 above).

Given Maingate's proven track record with previous trials, together with existing solutions being in place, there are tried and tested procedures in place to ensure the security and confidentiality of data within Maingate systems. The solution is built on existing systems and methodologies, ensuring a robust trial with accurate data and secure flows.



# THE COMMUNITY ENERGY COACHING PROGRAMME



## START-UP MANUAL

Draft, April 2013



# Appendix N Benefits from Adoption of Energy Efficient Lighting

Professor Furong Li, Zheiming Wang, University of Bath, 8<sup>th</sup> August 2013

Significant opportunities exist in domestic dwellings for demand reduction, this is particularly so for lighting.

Lighting is responsible for 11.5% domestic consumption. For a typical household, this demand is driven by 14 light bulbs, each with the power of 60 Watt [1].

The aim of this report is to quantify the benefits from introducing LED lighting to domestic dwellings, both in term of the reduction in total energy consumption and the reduction in peak demand, and the consequential reduction in future network investment.

## 1. Future network investment deferral from introducing efficient LED lighting

In order to quantify the network benefits from introducing LED lighting, we have assessed to what extent the LED light may reduce simultaneous peak demand at the LV and the HV levels.

Lighting is responsible for 19% domestic consumption, figure 1 shows typical domestic demand profiles over the 12 calendar months. The peak demand of domestic demand is around 8:00 in January, and the corresponding peak demand is 25.59 GW.

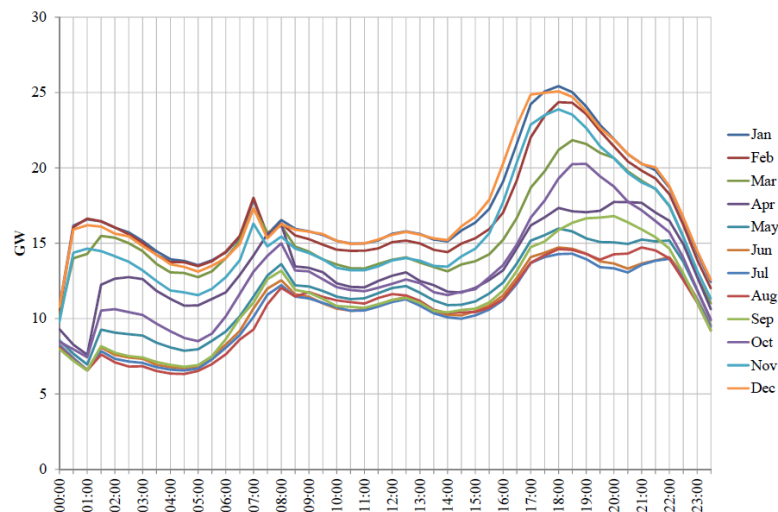


Figure 1 GB domestic demand by calendar month [2]

The number of households in GB is 26 million, and the coincidence factor in domestic area is chosen 0.8 [3]. Also, considering typical household demand profiles by appliances [4], the household demand by appliances at peak are summarised in Table II.

Table II Household peak demand

	Demand
Aggregated household peak demand (National level)	1.64 kW
Peak demand for individual dwelling	2.05 kW
Lighting for individual dwelling	0.313 kW
Wet appliances for individual dwelling	0.178 kW

The household peak demand for lighting is 0.313 kW, implying that 6 bulbs are in operation at the time of individual dwelling peak. When the powers for lighting at each dwelling is aggregated from the household level to HV/LV levels, the light demand at LV, HV and national peaks are shown in Table III.

Table III Lighting demand at LV, HV and national peaks

	National Demand (GW)	HV Demand (GW)	LV Demand (GW)
Lighting (National)	4.49	6.41	7.49
Solent	0.04	0.06	0.07

If the traditional bulbs are replaced by the LED lights, which lead to 70% energy saving, the new system peaks with efficiency interventions for GB are shown in Table IV, and for Solent is shown in Table V.

Table IV New system peak from LED interventions (GB)

	National Demand (GW)	HV Demand (GW)	LV Demand (GW)
Lighting	1.35	1.92	2.25
Peak Reduction	3.14	4.49	5.24

Table V New system peak from LED interventions (Solent)

	National Demand (GW)	HV Demand (GW)	LV Demand (GW)
Lighting	0.012	0.017	0.020
Peak Reduction	0.028	0.040	0.047

From our study on the cost of following 2050 Alpha pathways, the cost of additional capacity for HV and LV are: £151,339 (£/MW) and £320,243 (£/MW) respective [5], the network cost savings from demand reduction as a result of LED interventions are shown in Table VI.

Table VI Network benefits from introducing LEDs to GB and Solent domestic dwellings.

	GB Wide LED Intervention	Solent wide LED Intervention
HV reinforcement £151,339 (£/MW)	£679m	£6m
LV reinforcement £320,243	£1.68bn	£15m
Total	£2.3bn	£21m

## 2. Future energy cost reduction from introducing efficient LED lighting

Average household electricity consumption in the UK is 4227 kWh, and lighting is responsible for 11.5% of this consumption. The move to LED lighting could lead to 70% energy reduction. Therefore, energy reduction per household is 340kWh for a calendar year. For the 26 million households in GB, the annual energy reduction could reach 8.85 TWh. For the Solent area, the annual energy reduction could be around 79GWh.

137,000,000

To convert the energy reduction into cost savings, we take reference from National Grid for future electricity prices, as shown in Figure 2 [6].

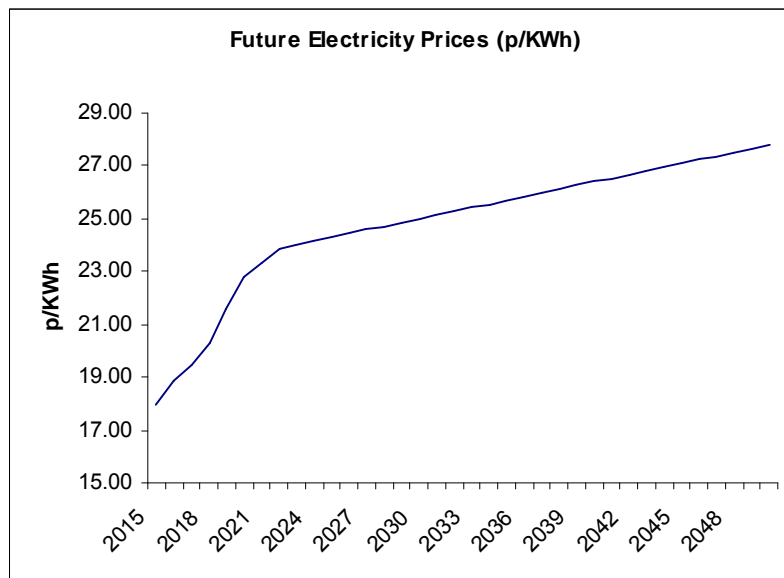


Figure 2. UK future electricity prices.

Of the electricity price, 55% is due to energy cost as informed by Ofgem [7], the benefit for energy cost saving from introducing LED for the UK and the Solent area is shown in figures 3 and 4 respectively. In average, the energy cost savings per year from 2015 to 2050 is £1.2bn for the UK and £10.8m for the Solent area.

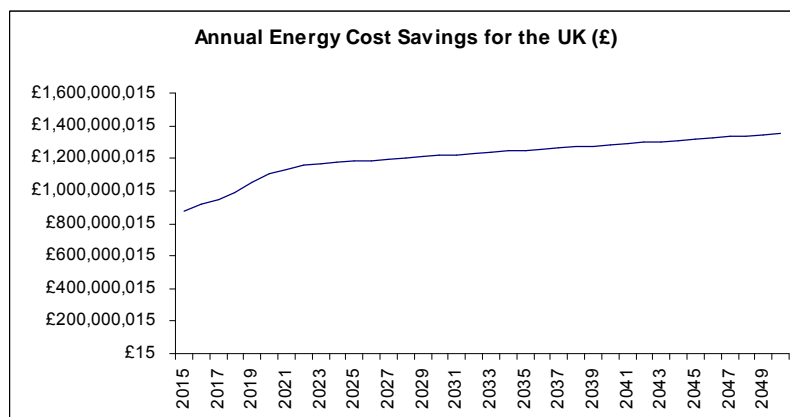


Figure 3. Annual energy cost saving from introducing LED for the UK.

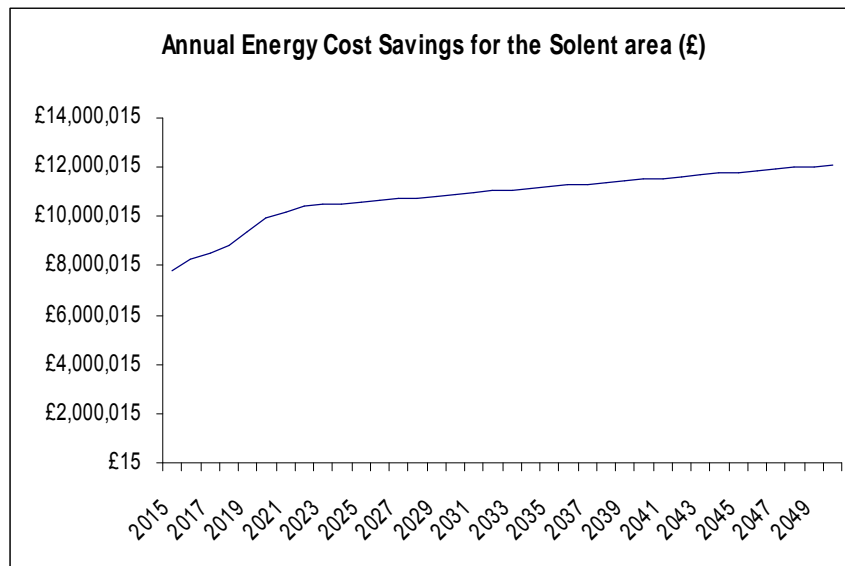


Figure 4. Annual energy cost saving from introducing LED for the Solent area.

### 3. Cost benefit analyses with and without network benefits

The cost and benefit analyses are carried out against the present value of net benefits. We performed CBA analyses without considering network benefits first, contrasting the results by including network benefits later, thus showing additional benefits that could be extracted from wide-spread LED adoption.

The cost of LED installation for each household is assumed to be £137, given typical life time of LED is around 15 years, thus two installations are required over the period of 2015 – 2040, one in 2015, one in 2030. The cost of these two installations over 500,000 homes in Solent areas would give the total installation cost of £89m, and £5.6m per year.

The annual benefit in energy costs from adopting LEDs is £5m in average and in real term over the 25 year. This is based on 79GWh annual energy saving for the Solent area, using energy price forecasted by National Grid.

LED adoption also brings £680k saving in average and in real term over the 25 year period. This is based on the premise that we can access this network benefit immediately. This implies an extra 11% discount per year for customers due to additional benefits from the HV/LV investment deferral. This additional network benefits will also increase the total net present value of the project from £57m over the 25 years to £74m, adding extra 23% value to the project.

Table VII shows the annual cost, benefits from 2015-2040, where both cost/benefits are presented in values in the future times and in real term. In addition, the Net Present Value of the project, i.e. the benefit subtracted by the cost and discounted back to the present, this is presented for both with and without network benefits.

Table VII The annual cost, benefits, net benefits from 2015-2040

Project year	Annual Cost (Installations in 2015 and 2035) (£ m)	Annual energy benefits (£ m)	Annual network benefits (£ m)	Present Value of annual cost (£ m)	Present Value of Annual energy benefits (£ m)	Present Value of Annual network benefits (£ m)	Net Present Value without network benefits (£ m)	Net Present Value with network benefits (£ m)
2015	5.59	7.82	1.33	5.01	7.02	1.19	1.60	2.79
2016	5.59	8.24	1.33	4.75	6.99	1.13	1.87	2.99
2017	5.59	8.48	1.33	4.50	6.82	1.07	1.96	3.03
2018	5.59	8.86	1.33	4.26	6.75	1.01	2.15	3.16
2019	5.59	9.40	1.33	4.03	6.78	0.96	2.42	3.38
2020	5.59	9.93	1.33	3.82	6.78	0.91	2.66	3.56
2021	5.59	10.17	1.33	3.62	6.58	0.86	2.67	3.53
2022	5.59	10.41	1.33	3.42	6.38	0.81	2.68	3.49
2023	5.59	10.48	1.33	3.24	6.07	0.77	2.57	3.34
2024	5.59	10.54	1.33	3.07	5.79	0.73	2.47	3.20
2025	5.59	10.60	1.33	2.91	5.51	0.69	2.37	3.06
2026	5.59	10.66	1.33	2.75	5.25	0.65	2.27	2.93
2027	5.59	10.72	1.33	2.61	5.00	0.62	2.18	2.80
2028	5.59	10.78	1.33	2.47	4.76	0.59	2.09	2.68
2029	5.59	10.84	1.33	2.34	4.53	0.55	2.01	2.56
2030	5.59	10.90	1.33	2.21	4.32	0.53	1.93	2.45
2031	5.59	10.96	1.33	2.10	4.11	0.50	1.85	2.34
2032	5.59	11.02	1.33	1.99	3.91	0.47	1.77	2.24
2033	5.59	11.08	1.33	1.88	3.73	0.45	1.70	2.14
2034	5.59	11.14	1.33	1.78	3.55	0.42	1.63	2.05
2035	5.59	11.20	1.33	1.69	3.38	0.40	1.56	1.96
2036	5.59	11.26	1.33	1.60	3.22	0.38	1.49	1.87
2037	5.59	11.32	1.33	1.51	3.06	0.36	1.43	1.79
2038	5.59	11.38	1.33	1.43	2.92	0.34	1.37	1.71
2039	5.59	11.44	1.33	1.36	2.78	0.32	1.31	1.63
2040	5.59	11.51	1.33	1.28	2.64	0.30	1.26	1.56
Total	145	271	34	72	129	17	57	74

## Reference:

- [1] Electropaedia. (2005). *Electricity Demand*. Available: [http://www.mpoweruk.com/electricity\\_demand.htm](http://www.mpoweruk.com/electricity_demand.htm)
- [2] SerenaHesmondhalgh and SustainabilityFirst. (2012). *GB Electricity Demand – 2010 and 2025. Initial Brattle Electricity Demand-Side Model – Scope for Demand Reduction and Flexible Response*. Available: <http://www.sustainabilityfirst.org.uk/docs/2011/Sustainability%20First%20-%20GB%20Electricity%20Demand%20Project%20-%20Paper%20-%20-%20GB%20Electricity%20Demand%202010%20and%202025%20-%20Initial%20Brattle%20Electricity%20Demand-Side%20Model%20-%20February%202012.pdf>
- [3] ENA. (2010). *Common Distribution Charging Methodology*. Available: <http://www.energynetworks.org/electricity/regulation/structure-of-charges-cdcm/common-distribution-charging-methodology.html>
- [4] DECC, "Energy Consumption in the UK-Domestic Tables," ed, 2013.
- [5] Report for DECC by Poyry/Bath, "Demand Side Response: Conflict between Supply and Network Driven Optimisation", 2010.
- [6] NationalGrid, "UK future energy scenarios," 2011.
- [7] Ofgem, "Updated household energy bills explained," ed, 2013.

## Appendix O Partner information

Organisation	Future Solent
Relationship to DNO (if any)	There is no ownership relationship between DNO and the collaborator.
Type of Organisation	Future Solent is a joint initiative by the Solent LEP, PUSH and Hampshire Chamber of Commerce responsible for the development and delivery of the low carbon plans in the Solent area. Future Solent aims to bring together a variety of initiatives, activities and projects from Local Authorities, large and small businesses, universities and colleges in the Solent and Isle of Wight area.
Role in Project	Future Solent's role in the project provides credibility and the ability to broker with businesses, local authorities and academia. Future Solent will provide some of the services required to implement the outputs of the SAVE project in the form of access to information on communities and having an active dialogue with businesses and local authorities. Furthermore, Future Solent brings private sector commitment and support.
Prior experience brought to Project	Future Solent has successfully developed and implemented a handful of projects which currently assist the UK SME supply chain. Future Solent has a unique insight into the challenges of growth on local infrastructure and is proactively addressing these by participating in the project. Future Solent's intellectual capital and regional experience will leverage lessons from outside the Solent region and ensure UK's continued leadership in the sector moving forward.
Funding	Future Solent will contribute 'in kind' assistance where appropriate in relation to its resources available, comprising labour, data collections, networking and marketing and promotion of the SAVE project.
Contractual relationship	Will the DNO have a contract in place which ensures the External Collaborator complies with the LCN Fund Governance Document? No
External Collaborator benefits from the Project	Future Solent will see the benefits from the project as it will prepare electricity networks for supporting a range of low carbon initiatives and will also see business and local communities compliment each other's energy spectrum. By increasing resilience in networks to improve supply security, increases local sustainable generation and delivery efficiency benefits through investment in low carbon. Furthermore, Future Solent will also establish a strategic dialogue between local communities and DNOs.

Organisation	University of Southampton
Relationship to DNO (if any)	There is no ownership relationship between DNO and the collaborator. Collaborator is an existing, legally arms-length supplier to DNO.
Type of Organisation	Collaborator is a university dealing with research and development
Role in Project	Our role will be in construction of the engagement survey, data analysis and reporting and the development of the model and initial disaggregated demand-response scenarios based on appropriate statistical and analytical GIS tool. An interactive web -mapping based tool will then be developed to allow partners to interrogate the results of these scenarios and to undertake their own simulations using variations of the implemented models and scenarios. Downloading of area level results for input to internal DNO models will be supported.
Prior experience brought to Project	The University's Faculty of Engineering and the Environment has a strong track record of driving research in the areas of renewable energy, energy efficiency and consumption (user behaviour) as well as in the generation of tools to support industry and practitioners to achieve optimal solutions in these areas. Within the Faculty, the Sustainable Energy Research Group (SERG) and the Energy and Climate Change Division ECCD (see <a href="http://www.energy.soton.ac.uk">www.energy.soton.ac.uk</a> ), bring together a unique combination of skills and expertise to identify approaches and solutions to address the relevant aspects of the themes of the proposal. The ECCD team is working extensively to promote the low carbon route for cities and regions. The team's research projects encompass the study of eco-city development, resource assessment, technology pathways for producing/conserving energy, forward planning, and social and economic studies required in establishing eco -regions -both within the UK and internationally. In addition, ECCD/SERG brings to the project a wealth of experience gained through previous and current funded programme in areas which has relevance to the SAVE project. These are programmes are listed in Appendix S – UoS Track record and role in the project.
Funding	Collaborator will contribute £ X to support X PhD studentships as benefit in kind to the project, comprising labour, facilities, and services.
Contractual relationship	Will the DNO have a contract in place which ensures the External Collaborator complies with the LCN Fund Governance Document?  SEPD and University of Southampton are engaged in negotiation and targeting signature prior to funding award.
External Collaborator benefits from the Project	University of Southampton will benefit through: (i) Learning outcomes that will drive research and development, the creation of capacity in energy efficiency, development of courses, publications , and societal impacts (ii) LCNF projects are integral to UK's future Grid roadmap providing exemplars in technology adoption facilitating further development and research (iii) Regional impacts through adoption of measures identified within the project and (iv) the creation low carbon networks domain leadership at building, community, city and regional levels.

Organisation	ELEXON Ltd
Relationship to DNO (if any)	There is no commercial or legal relationship between DNO and ELEXON. ELEXON delivers the Balancing and Settlement Code (BSC), of which the DNO is a signatory.
Type of Organisation	ELEXON was established, as BSCCo, in 2000 to deliver the BSC. ELEXON acts as the contracting party with service providers; employs individuals involved in the management of the BSC and provides secretariat and resources to support the BSC governance arrangements. National Grid is the sole shareholder. ELEXON is a non for profit organisation funded by BSC signatories – organisations that trade in the electricity market.
Role in Project	ELEXON has three main roles in the project: (a) Facilitating Supplier engagement to encourage their participation in the project; enabling data provision from 2,000 smart meters; using ELEXON's independent role in the industry to enable a "whole market" approach where any supplier can participate. (b) Facilitating the settlement of the DNO pricing signals to Suppliers to verify the savings that can be passed between all parties (DNO, Supplier and customer) using the half hourly smart meter data. (c) Assessing the project findings to understand how a RIIO regulatory incentive mechanism could be put in place to settle future energy efficiency related DNO price signals.
Prior experience brought to Project	Our role in the SAVE Project builds on expertise from delivering the Balancing and Settlement Code for over a decade. We bring strong relationships with suppliers and experience of designing and validating market settlement processes. As key advisors to industry, government and regulators, ELEXON is accustomed to evaluating market developments and presenting reasoned solutions.
Funding	ELEXON will contribute £X as benefit in kind to the project, comprising Director and management contributions, facilities, communications channels and settlement and payment platforms.
Contractual relationship	Will the DNO have a contract in place which ensures the External Collaborator complies with the LCN Fund Governance Document? The contract between ELEXON and SEPD detailing the scope of work and compliance with the LCNF Governance document will be finalised after the Funding Direction from Ofgem and prior to the start of the project
External Collaborator benefits from the Project	Benefits to ELEXON, and BSC Parties, include: 1. Participating in LCNF projects fits with ELEXON's ambition to be "a leader in the efficient transformation of energy markets – by providing shared solutions to address common industry problems." Project SAVE seeks to address known grid capacity, reinforcement and flexibility challenges and to that ELEXON brings understanding of settlement and smart grid developments. ELEXON can help facilitate the development of rational solutions that have been supported by suppliers and shared with other DNOs and so can be implemented widely. 2. Practical involvement in LCNF projects brings ELEXON more detailed foresight of challenges facing the GB electricity market, enabling our Market Designers to gain earlier warning of future issues and better insight into innovative but effective solutions. 3. The Project provides an example of how collaboration between a DNO, suppliers, Code body, industry and academia can be much more effective and better value for money in solving industry problems than isolated efforts. ELEXON brings independence and relationships that ensure the Project can connect to other sources of advice and information that increase the likelihood of success and sustainable impact.



Organisation	DNV KEMA Ltd
Relationship to DNO (if any)	There is no ownership relationship between DNO and the collaborator. Collaborator is an existing, legally arms-length supplier to DNO.
Type of Organisation	DNV KEMA Energy & Sustainability specialises in providing world-class, innovative solutions in the fields of business & technical consultancy, testing, inspections & certification, risk management, and verification. DNV KEMA is part of DNV, a global provider of services for managing risk with more than 10,000 employees in over 100 countries.
Role in Project	<p>DNV KEMA will undertake the following roles:</p> <ul style="list-style-type: none"> <li>• Project Design Authority, including the methodology and technical co-ordination across the project</li> <li>• Management of the project customer engagement, including the strategy and planning, provision of the customer engagement lead, and reporting on the customer engagement trials</li> <li>• Research into international Energy Efficiency programmes, and LCNF programme learning on consumer engagement</li> <li>• Evaluation and assessment including Project Summary report, Network Toolkit outcomes report, LED trials report, Network Rebate Trials report</li> </ul>
Prior experience brought to Project	<p>DNV KEMA brings the following experience to the project:</p> <ul style="list-style-type: none"> <li>• Customer engagement learning from the similar role carried out for the LCNF Thames Valley Vision project</li> <li>• Smart Energy experience and stakeholder engagement capability from programmes such as Smart Energy Collective in the Netherlands, and EVs in Germany and US</li> <li>• Energy Efficiency programmes learning from the US, including trial design and evaluation where we have several hundred project references</li> <li>• Results analysis, e.g. for PowerMatching City in Holland</li> </ul>
Funding	DNV KEMA has applied a X% discount to its standard rates.
Contractual relationship	<p>Will the DNO have a contract in place which ensures the External Collaborator complies with the LCN Fund Governance Document? Yes</p> <p>Collaborator engaged in negotiation and targeting signature prior to funding award.</p>
External Collaborator benefits from the Project	<p>As a result of participation in the project DNV KEMA will apply learning and experience from the project in, for example:</p> <ul style="list-style-type: none"> <li>• The application of Energy Efficiency schemes in the UK and Europe, including a focus on user benefits</li> <li>• Enhanced Consumer Engagement strategies</li> </ul>

Organisation	Wireless Maingate ("Maingate")
Relationship to DNO (if any)	There is no ownership relationship between DNO and Maingate. Maingate is an existing, legally arms-length supplier to DNO.
Type of Organisation	Founded in 1998, Maingate is the world's first service operator specialising in secure and scalable management solutions that connect people, machines, and information. Our solutions provide end-to-end network control for energy service and industrial companies. See Appendix L for further details on this and all other areas of information.
Role in Project	With respect to the SAVE project, we will be sharing our unique insight in two main areas: <ol style="list-style-type: none"> <li>1) Consumer engagement for energy reduction, via provision of our technical solutions</li> <li>2) Maingate's open-architecture platform will sit at the heart of the project acting as the central data repository. The platform is open, robust and proven and will add significant value to SAVE and bring to life the data flows from all silos, solutions and systems</li> <li>3) We will apply our learning and expertise from other countries to the SAVE project</li> </ol>
Prior experience brought to Project	<ul style="list-style-type: none"> <li>• Currently working with around 300 Utilities across Grid, Metering and Home</li> <li>• Nearly 8 million energy user's data passing through our systems in real time currently</li> <li>• Technology solutions served to 1,000 clients in over 40 countries</li> <li>• 55% of all smart meters in Sweden are connected to Maingate</li> <li>• 20% of all smart meters in Finland</li> <li>• 70% of all mobile payments are passed through Maingate's systems</li> <li>• 40% of all residential alarms in Sweden are connected through Maingate</li> </ul>
Funding	Maingate will contribute £X as benefit in kind to the project, comprising labour, facilities and discounted products and services.
Contractual relationship	<p>Will the DNO have a contract in place which ensures the External Collaborator complies with the LCN Fund Governance Document? Yes</p> <p>Collaborator engaged in negotiation and targeting signature prior to funding award.</p>
External Collaborator benefits from the Project	Maingate will benefit from the project as : (i) LCNF projects are integral to UK's Smart Grid roadmap and accelerated technology adoption, (ii) learning outcomes will drive national adoption of technologies, (iii) LCNF is leveraged as an exemplar of regulatory incentives across Europe, and (iv) LCNF positions UK as the thought leader in the low carbon networks domain.

Organisation	University of Bath
Relationship to DNO (if any)	There is no ownership relationship between DNO and the collaborator. Collaborator is an academic institution, providing research support to DNO.
Type of Organisation	Collaborator is a High Education Institute, one of the leading research intensive universities in the UK with a strong track record of innovation and entrepreneurship as well as teaching and research. The University's total research grant income is approximately £30M per annum, with a current portfolio of £100M. Founded in 1966, we are extremely successful for a university of its age, ranking 12th in the 2011 QS World University Rankings list "Top 50 Under 50".
Role in Project	Collaborator will build on their extensive expertise in distribution network modelling, analyse, planning and pricing, contribute to the project in the following key areas: i) network modelling reflecting the effects from different types and degrees of energy efficiency measures, ii) ranking the relative efficiency of the proposed 5 measures and developing optimal combination for a range of network types, i.e. urban versus rural, iii) developing innovative tariffs reflecting the additional benefits in networks from adopting energy efficiency measures, iv) helping to inform the industry the overall benefits from extracting additional value from energy efficiencies.
Prior experience brought to Project	Collaborator has recently conducted detailed modelling and analysis studies for all 6 GB distribution network operators through EPSRC and industrial funded projects. They have been commissioned by DECC to inform the cost of decarbonising the UK electricity generation, and by Ofgem resulting in a common distribution charging methodology. Bath received the 2009 Rushlight Power Generation and Transmission Award, and a nomination by The Times Higher Education for the 2009 Award of Outstanding Contribution to Technology and Innovation.
Funding	Collaborator will contribute £X as benefit in kind to the project, providing additional PhD research resources to provide further support to the project, ensuring its successful delivery.
Contractual relationship	Will the DNO have a contract in place which ensures the External Collaborator complies with the LCN Fund Governance Document? Yes  Collaborator engaged in negotiation and targeting signature prior to funding award.
External Collaborator benefits from the Project	Collaborator will benefit from the SAVE project, it : (i) will accelerate our university's fundamental research on sustainable energy system and the environment, (ii) help us to maintain our international leading position in low carbon research, (iii) a nature mechanism to ensure the impact of our research is maximised for the UK research base and economy.

## **Appendix P Sample of letters of support from partners**

The SAVE project has received letters of support from the following partners:

- University of Southampton
- ELEXON
- DNV KEMA
- Wireless Maingate ("Maingate")
- Future Solent
- University of Bath

In this Appendix are letters of support from University of Southampton and ELEXON.

All letters of support are available upon request.

Ofgem - London  
9 Millbank,  
London,  
SW1P 3GE

Wednesday 31<sup>st</sup> July 2013

Dear Ofgem

**RE: Solent Achieving Value from Efficiency (SAVE)**

I am writing, in my capacity as Dean of the Faculty of Engineering and the Environment, in support of the above consortium proposal led by Scottish and Southern Energy Power Distribution. I feel this proposal will result in a robust understanding in relation to the extent that energy efficiency measure interventions can be utilised as a cost effective, predictable and sustainable tool for managing electrical network peak demand as an alternative to network reinforcement.

Energy is one of the pillars of the University's research activity and is supported centrally through one of the University's strategic themes for research and development. The aim of the University's research strategy is to develop and maintain an intellectual and physical environment that fosters and supports world-leading cross-disciplinary research in areas where Southampton has an outstanding track record of achievement, such as energy. The University will also continue to support and build the strength of the many individual disciplines that underpin our multidisciplinary research encompassing both national and international collaboration.

Meeting our current and future energy needs, whether regional national, or international, will create a demand for engineers and scientists with the necessary cross-disciplinary planning and integrating skills as well as technical expertise. The University's Faculty of Engineering and the Environment has a strong track record of driving research in the areas of renewable energy, energy efficiency and consumption (user behaviour) as well as in the generation of tools to support industry and practitioners to achieve optimal solutions in these areas. Within the Faculty, the Sustainable Energy Research Group and the Energy and Climate Change Division ECCD (see [www.energy.soton.ac.uk](http://www.energy.soton.ac.uk)), bring together a unique combination of skills and expertise to identify approaches and solutions to address the relevant aspects of the themes of the proposal. The ECCD team is working extensively to promote the low carbon route for cities and regions. The team's research projects encompass the study of eco-city development, resource assessment, technology pathways for producing/conserving energy, forward planning, and social and economic studies required in establishing eco-regions -both within the UK and internationally

The University recognises the importance of energy efficiency as a means to reduce carbon emissions and conserve resources as well as the benefits gained through the introduction of such measures by the network operators. The University is fully committed to support the SAVE project and will provide funding for three PhD studentships valued at around £180k, in the areas covered during the term of this proposal.

I feel the SAVE proposal is based on a strong consortium combining industry and academia, providing the necessary skills, expertise and experience for the successful execution of the project.

Should you have any further questions regarding the above, please do not hesitate to contact me.

Yours sincerely



Professor William Powrie FREng  
Dean of the Faculty of Engineering and the Environment

Reference: Low Carbon Networks Fund – Project SAVE

Brian Shewan  
Future Networks and Policy  
SSE  
55 Vastern Road  
Reading  
Berkshire, RG10 8BU

31 July 2013

Dear Brian,

On behalf of ELEXON I am pleased to provide this Letter of Support to the submission by SEPD for the LCNF project Solent Achieving Value from Efficiency ("Project SAVE").

ELEXON has provided input to the planning and preparation of the submission. Subject to modification of the BSC and final agreement of our role and terms of contract, we are looking forward to taking part in the Project when the funding direction from Ofgem is secured.

Our role in the Project builds on expertise from delivering the Balancing and Settlement Code for over a decade. We bring strong relationships with suppliers and experience of designing and validating market settlement processes which we hope will ensure the Project is successful in delivering learning and outcomes that can be widely adopted.

Yours sincerely

A handwritten signature in blue ink, appearing to read "Mark Bygraves".

Mark Bygraves  
Director of Strategy and Development

## Appendix Q - Summary of regulatory issues and derogations which may be required

Condition	Issue	Customer impact – why are we requesting the derogations?	Summary of derogation request	Timeline
<b>ELECTRICITY ACT 1989</b> <b>Standard conditions of the Electricity Distribution Licence</b>				
<b>Licence Condition 13 - Charging Methodologies for Use of System and connection</b>	<p>The SAVE Project will trial the impact of DNO pricing signals based on SEPD substation / network peaks in the trial area of Solent in Southern England. We will be trialling and evaluating 2 main areas:</p> <p>1. Time of Use Tariffs</p> <p>Times focussed around SEPD substation/ network peaks in the trial area. Price signals will be developed by SEPD and passed through to customers via tariffs developed by the Suppliers</p>	<p>Trialling alternative network solution tools to the traditional reinforcement method;</p> <p>Evaluate new Tariffs and Incentives</p> <p>Accelerating the low carbon agenda by freeing up capacity on the network</p> <p>Drive for cheaper charges to DNO and customer</p>	<p>It is anticipated that the SAVE project will require modification to CDCM Model and incorporation of a bespoke Time of Day (TOD) for these customers with dedicated Line Loss Factors Class (LLFC)</p>	<p>Trials are due to start January 2016</p>
<b>Licence Condition 14 – Charges for Use of System and connection</b>	<p>2. DNO Threshold Discount</p> <p>This will reflect the potential savings of avoiding/deferring network reinforcement costs. Discounts to be passed direct from SEPD to the customer.</p>	<p>Reduce costs and improve efficiency of the networks</p> <p>Reduce Disruption to the customers (avoid digging up the roads and footpaths)</p>		

Licence Condition 19 – Prohibition of discrimination under Chapters 4 and 5	The Retail Market Review final proposals include for tariff conditions relating to customer access, incentive types and eligibility.	Trialling alternative network solution tools to the traditional reinforcement method;	Derogation requests will be required from individual Suppliers to trial geographical limited tariffs to selected customers.	Trials are due to start January 2016
Retail Market Review proposals for modifications to Supply Licences	<p>The SAVE project is targeted at Suppliers and customer types within the Solent region in South England.</p> <p>The SAVE project will engage with specific customer samples. Customers will be recruited to provide valid trial data for the project trials that can be extrapolated to other regions and scenarios.</p>	<p>Evaluate new Tariffs and Incentives</p> <p>Accelerating the low carbon agenda by freeing up capacity on the network</p> <p>Drive for cheaper charges to DNO and customer</p> <p>Reduce costs and improve efficiency of the networks</p> <p>Reduce Disruption to the customers (avoid digging up the roads and footpaths)</p>	<p>Cash incentives may be required for short term participation.</p> <p>Will confirm with Ofgem whether project can submit derogation requests on behalf of suppliers if offering identical tariff and incentive models.</p>	



## **Appendix R Sample of letters of support from suppliers**

The SAVE project has received letters of support from the following suppliers:

- British Gas
- Coop Energy
- Flow Energy
- Ovo
- SSE

In this Appendix are letters of support from Flow Energy and SSE.

All letters of support are available upon request.



To ELEXON, Southern Electric Power Distribution and Ofgem,

I am pleased to write on behalf of Flow Energy to support the trialling of new Distribution pricing signals in the Low Carbon Network Proposal SAVE, as developed by Southern Electric Power Distribution (SEPD).

We will support the trial by developing a trial tariff with non-standard pricing to a portion of our customer base in the Solent region. The non-standard trial tariff will pass on price signals from SEPD. We will support the trial by helping to identify potential trial customers and through installing and maintaining the smart meters. Subject to operational constraints we would hope to deliver at least 500 smart meters.

Flow Energy is keen to support the project as we believe it will provide useful cross-industry learning and increase our understanding of how to work with distribution networks. We are pleased that ELEXON will act as the independent agent to verify data, settlement and in disseminating any cross-industry learnings that could be put in place to support a future RIIIO Incentive Mechanism.

Yours sincerely,

A handwritten signature in black ink, appearing to read "Andrew Beasley".

Andrew Beasley

**Flow Energy Limited**

Felaw Maltings

48 Felaw Street

Ipswich IP2 8PN

T +44 (0)20 3137 4466

[info@flowenergy.uk.com](mailto:info@flowenergy.uk.com)

[www.freeflow.uk.com](http://www.freeflow.uk.com)



55 Vastern Road  
Reading  
RG1 8BU

31<sup>st</sup> July 2013

**To ELEXON, Southern Electric Power Distribution and Ofgem,**

I am pleased to write on behalf of SSE to support the trialling of new Distribution pricing signals in the Low Carbon Network Proposal SAVE, as developed by Southern Electric Power Distribution (SEPD).

We will support the trial by developing a trial tariff with non-standard pricing to a portion of our customer base in the Solent region. The non-standard trial tariff will pass on price signals from SEPD. We will support the trial by helping to identify potential trial customers and through installing and maintaining the smart meters. Subject to operational, legal and regulatory constraints we would hope to deliver around 1500 smart meters.

SSE is keen to support the project as we believe it will provide useful cross-industry learning and increase our understanding of how to work with distribution networks. We are pleased that ELEXON will act as the independent agent to verify data, settlement and in disseminating any cross-industry learnings that could be put in place to support a future RIIO Incentive Mechanism.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'R. Westoby', with a long, sweeping horizontal line extending from the end of the signature.

Richard Westoby  
Director of Retail Economics

## Appendix S

### The University of Southampton (UoS) Track Record and Role in the Project

The University of Southampton ([www.soton.ac.uk](http://www.soton.ac.uk)) is one of the UK's top 10 research-led universities, with a global reputation for excellence in both teaching and research and first-rate opportunities and facilities across a wide range of subjects in science and engineering, health, arts and humanities. The University has over 20,000 students and 5,000 staff at its 5 campuses in Southampton and Winchester. Its annual turnover is in the region of £440 million and has one of the highest UK's Research Councils' grant income. The University is at the forefront of energy studies including sustainable power generation and energy demand reduction at the housing, community and city levels. The SAVE project is closely aligned with the University of Southampton's strategy to grow our Faculty of Engineering and the Environment, one of the key strengths of the institution. In addition, the proposal fits with several of the University's strategic research groups, including Energy and Sustainability Science. The research and development within these areas are conducted within the *Energy and Climate Change Division* (ECCD) encompassing the Sustainable Energy Research Group; (SERG), which was established in 1990 ([www.energy.soton.ac.uk](http://www.energy.soton.ac.uk)).

Within SAVE, ECCD will bring in a wealth of expertise gained through funded research programmes in energy demand reductions. Our role will be in construction of the engagement survey, data analysis and reporting and the development of the model and initial disaggregated demand-response scenarios based on appropriate statistical and analytical GIS tool. An interactive web-mapping based tool will then be developed to allow partners to interrogate the results of these scenarios and to undertake their own simulations using variations of the implemented models and scenarios. Downloading of area level results for input to internal DNO models will be supported.

ECCD within the Faculty of Engineering and Environment at Southampton has staff and researchers of around 45 and is led by **Prof A S Bahaj** - Professor of Sustainable Energy. Over the last 23 years he has established the energy theme within the University, and has developed an exemplary culture of cross-disciplinary research activities across the energy portfolio. Prof Bahaj has authored/co-authored more than 240 peer reviewed and conference papers that span urban energy systems (including demand reduction, microgeneration and monitoring and feedback) and the built environment (working at the city, village and building scales). He is the PI on the following EPSRC grants: SUE1 Innovation in the Design Construction and Operation of Buildings for People (IDCOP) (2004-09, £1,734K), EPSRC-China EcoNetworks (2008-10, £181K), Replication of Rural Decentralised off-grid Electricity Generation through Technology and Business Innovation (2009-14, £2,540K), and CoI on TEDDI Intelligent Agents for Home Energy Management (2010-13, £813K) as well as consortium member of variously funded ESRC, EU and TSB research. He is the Editor-in-Chief of the *International Journal of Sustainable Energy*, and Associate Editor of the *Renewable & Sustainable Energy Reviews*. He was a member of the Tyndall Centre for Climate Change Research Supervisory Board (2005- 2010), and from 2001 to 2007 was a member of the UK Government Department of Business and Regulatory Reform (now Department for Business Innovations and Skills, BIS) Technology Programmes Panels on Water Energy & Solar Energy, now being administered by the Technology Strategy Board (TSB). In addition, Prof Bahaj will provide senior level management oversight of the project and its staff at 20% FTE throughout the project. This will encompass the following:

- Take a lead role in the project's senior management group to ensure that all partners contribute to the successful achievement of the project's objectives.
- Lead and oversee the University's overall contribution to the project.
- Provided linkage to Local Authorities (LAs) as well as his other funded projects such as the:
  - EPSRC £6.2million Liveable Cities project [www.energy.soton.ac.uk/liveable-cities/](http://www.energy.soton.ac.uk/liveable-cities/)
  - EPSRC £3.4million International Centre for Infrastructure Futures (ICIF) [www.energy.soton.ac.uk/international-centre-for-infrastructure-futures-icif/](http://www.energy.soton.ac.uk/international-centre-for-infrastructure-futures-icif/)
  - RCUK/DFID £2.6million Energy for Development project [www.energy.soton.ac.uk/category/research/energy-for-development/](http://www.energy.soton.ac.uk/category/research/energy-for-development/)
- Contribute significantly to project reporting and dissemination with a particular focus on communicating results to the wider energy research partnerships in the Solent region, stakeholders (academia, LA, etc.) and across the sector.

**Dr Anderson** is a Senior Research Fellow with over 17 years' experience leading 'strategic social science' research projects and programmes at the intersection of infrastructure and consumer demand modelling. His initial work in the telecommunications sector (BT plc) involved the implementation of a number of large scale household surveys with linked transactional (internet usage and telephone call record) datasets. This work culminated in the development of a spatially

disaggregated consumer demand model projecting small area expenditure on 'digital services' to 2021 as a basis for broadband investment cost/benefit analysis. In his subsequent academic career (University of Essex, University of Southampton) he has applied similar approaches to studying the demand for water and energy in the home. He recently co-lead a large-scale academic 'Water Practices' household survey in the South and East of England as part of the ESRC £1.6million Sustainable Practices Research Group ([www.sprg.ac.uk](http://www.sprg.ac.uk)) which is the basis for ongoing development of a spatially disaggregated water demand model. He is also a co-investigator of the ESRC/EPSRC £4.9million DEMAND End User Energy Research Centre ([www.demand.ac.uk](http://www.demand.ac.uk)) which focuses on the temporal and spatial analysis of large scale energy-use (smart meter) datasets as well as leader of a number of smaller ONS and ESRC funded projects. We require Dr Anderson's specific skills and experience at 20% FTE throughout the project in order to:

- Ensure appropriate senior level and experienced oversight of the sample & instrument design, fieldwork contract and trial/campaign implementation.
- Ensure appropriate senior level leadership and management of the data analysis and reporting.
- Ensure appropriate senior level leadership and management of the spatially disaggregated consumer demand response model activity which will draw directly on his previous experience of developing similar models for the commercial telecommunications sector.
- Ensure strong linkage to and exploitation of relevant results from a number of RCUK funded activities in which he is involved including:
  - a £250k ESRC funded project assessing the feasibility of using temporal energy monitoring data for the production of small area socio-demographic indicators (<http://www.energy.soton.ac.uk/census-2022-transforming-small-area-socio-economic-indicators-through-big-data/>)
  - a £180k ESRC funded project analyzing the factors affecting the uptake of home generation technologies (<http://www.energy.soton.ac.uk/esrc-sdai-attitudes/>)
  - the DEMAND End User Energy Demand Centre, a 5 year programme focusing on understanding how people's everyday use of energy creates emergent patterns of demand.

**Dr P A B James** is a Senior Lecturer and Programme Director for postgraduate taught education in energy within the Faculty of Engineering and the Environment. He leads the built environment research portfolio of the Faculty's Sustainable Energy Research Group ([www.energy.soton.ac.uk](http://www.energy.soton.ac.uk)). Dr. James' interests include micro-generation in the built environment, energy policy, thermal simulation and how people impact on the energy and comfort performance of spaces. He has published over 35 articles in international journals, including, Energy and Buildings, Solar Energy, Energy Policy and Renewable and Sustainable Energy Reviews and over 60 papers in national and international conference proceedings. He is a co-author of the *Unlocking the Power House* report (RES-338-25-0003) on the potential impact of micro-generation within the UK housing stock. He was also the lead researcher of the EPSRC SUE project 'Innovation in the Design Construction and Operation of Buildings for People' (£1734K). He led the analysis of the national micro-wind trial on behalf of the Energy Saving Trust, and leads the building energy work packages within the EPSRC TEDDI funded 'Intelligent Agents for Home Energy Management' project (£982K), and the ESRC funded project 'The Role of Community-Based Initiatives in Energy Saving' (£946K, RES-628-25-0059). He is also co-author of 'Why Waste Heat' the ICE report looking at the potential of heat recovery from centralised electricity generation in the UK. In 2009, he acted as an energy expert for DECC's *Big Energy Shift* running public consultation events across the UK.

We require Dr James' senior level research oversight at 10% FTE throughout the project in order to

- Contribute to customer engagement, oversee the implementation of the appropriately designed trial drawing directly on his experiences in the various project such as:
  - ESRC £1.0million Community Energy Project [www.energy.soton.ac.uk/the-role-of-community-based-initiatives-in-energy-saving/](http://www.energy.soton.ac.uk/the-role-of-community-based-initiatives-in-energy-saving/).
  - EPSRC £1.0million Intelligent Agents for Home Energy Management [www.energy.soton.ac.uk/teddi/](http://www.energy.soton.ac.uk/teddi/)
- Contribute significantly to the design of trial campaigns and interventions.
- Contribute to project reporting and dissemination.