LCN Fund Full Submission
Supplementary Answer Form

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Project code:	SSET206	Question Number	8
Question date	17 September 2013	Answer date	19 September 2013
Submission section question relates to	2. Project Description		
Topic	Technical		
Question	Please provide further details of the Network Investment Tool. Please describe the parameters that will be used to create and use the tool. Please describe how learning from other projects will inform this tool.		
Notes on question			
Answer	In summary, the network planner will be able to input the following details into the Network Investment Tool: network information; type of constraint; number of customers connected; sociodemographic mix of customers. The outputs will be: expected reduction in peak demand; expected reduction in total demand; longevity of reduction; cost of implementation; time for implementation. This will allow a comparison against traditional methods, and allow the planner to make the decision to implement the measure best suited to the challenges they are aiming to resolve. The University of Bath have developed a range of modelling and analysis innovations, considering differing network technologies, operating strategies and customers' preferences of supply reliability. Their technical modelling has been applied to networks of varying sizes and with differing characteristics, including EHV, HV and LV distribution networks. They have used this knowledge and experience to inform the requirements for the distribution network modelling, and therefore the NIT, as follows: Network modeling developed to date is based on probabilistic distribution for network components but not for users, i.e. demand. Further, the network models assume very little information about the network. For the SAVE project, we will develop three critical new innovations to the LV network modeling: i) to extend the triangular probabilistic distribution from the network to customers, thus taking into account of effects of energy efficiency measures, this will be achieved in conjunction with University of		

Southampton.

ii) to further refine the network modeling as more information becomes available on LV networks. A number of demonstration projects, such as Thames Valley Vision (SSE), LV Network Templates (WPD), Project Falcon (WPD), Low Carbon London (UK Power Network) and Class (Customer Load Active System Services, Electricity Northwest), will develop better understanding of the state of LV network system. We will further refine network modeling through introducing more network information and their relation to customers. This will be achieved by improving the probabilistic distribution for network and customers, considering potentially different distributions for differing network templates as defined by the learning from other LCNF projects.

iii) To extend the probabilistic approach from the LV network to HV network, and strike the balance between the accuracy, speed and scale.

Additional parameters have been informed by UoS- for the NIT to be developed, they will require temporal demand curves under a range of scenarios for areas in the Solent region. As a result the trials have been designed to provide this demand data, at a level of granularity that will allow further insight by revealing individual household demand. By matching these demand curves to the models, they will be used for simulating and assessing the effects of the energy efficiency measures, either adopted by pockets of the network, or spread right across the system. The assessment will then provide the basis for ranking energy efficiency measures against different types of network, as the best combination of efficiency measures could vary very significantly between urban and rural networks.

This is a successful approach that UoS have utilised with BT in the Telecomms sector.

The development of the NIT will utilise existing experiences from a range of projects that have carried out network analysis and modelling.

The following LCNF projects have elements that will be used to inform this tool: New Thames Valley Vision (SEPD); LV Network Templates (WPD); Project Falcon (WPD); Low Carbon London (UK Power Network); CLASS (Customer Load Active System Services, Electricity Northwest). Additional learning will be taken from other sources, such as the 2011 CEPE report 'Smart Meter Devices and The Effect of Feedback on Residential Electricity Consumption: Evidence from a Natural Experiment in Northern Ireland', and the Final Analysis of the Ofgem/DECC funded 'Energy Demand Research Project'.

We will engage with the teams involved in the above projects/research to gain further insight, avoid duplication and ensure the NIT builds on previous learning.

Supporting information on UoB's experience in modelling:

University of Bath has a strong track record in distribution network modeling, analyses and investment planning. We have conducted a number of detailed modelling and analysis studies of the GB distribution network. We developed a range of modelling and analysis innovations, considering differing network technologies, operating strategies and customers'

	preferences of supply reliability [1-12]. Our technical modelling has been applied to networks of varying sizes and with differing characteristics, including EHV, HV and LV distribution network in the South West and South Wales (WPD) , Yorkshire (Northern Power Grid), Aberystwyth (Scottish Power), and Isle of Wright (SSE). The modelling has been used by WPD and Northern Power Grid for network analyses, pricing and network investment, by Scottish Power for distribution network planning with active network management, by Ofgem to assess the long-term impact to network investment from introducing alternative economic charging methodology and, by DECC to quantify the level of investment required in EHV/HV/LV when following DECC 2050 Alpha Pathway. Bath is also heavily involved in Low Carbon Network Funds projects, including WPD's Low Voltage Network Templates, Project Bristol and Project Falcon.
Attachments	
Verbal Clarifications (Consultants)	