CLNR Working Paper: Social Science Overview, Sept 2012

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Introduction

The Customer Led Network Revolution (CLNR) is a large interdisciplinary project with a focus on researching electricity supply and demand. The project is funded by Ofgem[1]'s Low Carbon Networks Fund (LCNF). The core objective are to understand the nature of current and likely future electricity demand among households and small to medium sized organisations (Learning Objective 1 of 5)and to consider how, why and with what implications such demand might be 'flexible' (Learning Objective 2 of 5).

Through the project there is the potential to make significant contributions to academic and policy debates around the possibilities and challenges of the increasing electrification of energy services, a process being driven by climate change and energy security agendas. The team also seeks to contribute to a related set of debates around the notion of smart grids as being integral to the future of energy provision. We hope to be able to provide insight into the distribution of costs, benefits and the limits of these envisioned futures, which will be critical for policy choices going forward. In addition we also hope to engage with colleague sin industry, government and other academic colleagues to examine opportunities for innovation in electricity supply and demand.

The project is made up of over 20 individual 'test cells', which can be thought of as a series of mini trials. Each test cell has a group of participants who have agreed to a particular 'proposition' featuring some combination of characteristics which might include a tariff, network intervention, low carbon technology and smart meter monitoring. The test cells each seek to provide particular contributions to the learning objectives of the project.

Methods

The CLNR is using a range of methodologies across social and engineering sciences to study electricity demand, including a structured online survey, qualitative home or business tours, collection and analysis of smart meter data as well as monitoring 'the wires' at electricity sub-stations to detect operating conditions at the scale of a community.

It is important when taking this approach to minimise the extent to which findings are influenced by the research team in advance. The qualitative instruments are designed to allow the drivers, interactions and ingredients of everyday practices to emerge from the data collected from the participants without imposing preconceived ideas about how practices are structured. This approach calls for less formalised or structured instrumentation and places more emphasis on the skilled interviewer to encourage the participants to elaborate on how and why they conduct their energy practices. Tours of the participants' premises are designed so that technologies and everyday items can act as prompts for the participant to discuss their practices. However, there are some key areas of focus which need to feature in each qualitative visit in order to ensure that results are comprehensive and comparable. The instruments prompts make sure that the interviews and tours cover these areas.

These research activities will be integrated with engineering and mathematical analyses to create a significant and coordinated interdisciplinary contribution to understanding electricity demand. For each data type, customer data will be associated with a unique customer ID which will enable comparison and integrated analysis of individual customers across data types. For example, the team will be able to qualitatively analyse customers with unusual smart meter readings, or the smart meter data of groups of customers identified as interesting in the survey or qualitative work could be analysed statistically.

[1] Ofgem is the UK' regulator of gas and electricity markets.

Table 1 - CLNR Data & Analysis

Data Type	Size of Data Set	Scale of Analysis	Integrated Analysis
Survey	**~2k participants**	**Individual**	**Qual-Quant-Spatial-Statistical - Analysis**
Qualitative Tours	**~200 participants**	**Individual / Household**	
Smart Meter Data	**~15k participants, (mostly with meter level data, some with disaggregated appliance level data) >1bn data points**	**Household**	
Network Data	**Thermal Rating Enhanced Harmonics**	**Community**	

Progress to September 2012

At the time of writing the social science team has completed qualitative research activities with 52 organisations and 89 households, totalling 131 interactions

152 businesses have currently completed the non-domestic survey, while a further 1000 have recently been invited to do so. Over 600 domestic customers have completed the survey.

The team has presented interim findings at a number of academic and stakeholder conferences and events including the Association of American Geographers 2012, Royal Geographic Society 2012, European Association of Social Anthropologists Annual Conference 2012 .

Interim Analysis Overview

The research team collaboratively developed a set of themes which are being used to structure our analysis of the qualitative data. These themes come from discussions of the qualitative research process and literature reviews. The list of themes is not exhaustive and at this stage there is scope to modify the list for analysis of collected material and to feed into the design of winter fieldwork activity. Current Analytic Themes (as of Sept 2012) are as follows, with the dominant themes in bold:

- ***Accomplishing energy services & practices**
- Agency - power - politics
- Community
- Digital
- ***Economies**
- ***Engagement with System of Provision and the Trial**
- ***Health and Wellbeing**
- Hubs and environments
- Knowledge and know-how
- Motivations and Drivers, Responsibilities, Apathies
- Non-Humans and Technology Requirements
- Normality
- ***Participant Idenitity**
- Prosumers
- Refurbishment
- ***Rhythms and Thresholds**
- Role of Policy & Govt
- Social Networks
- Technical legacies and novelties
- The good life

