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Peak Demand and Customer Flexibility

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Until recently, network management which has focussed on the reinforcement of networks to cope with any foreseeable demand scenario. However, the electrification and decarbonisation of UK energy provision are now raising questions about the extent to which networks will continue to be able to serve peak demand this way. The CLNR project has experimented with time of use pricing to investigate its potential for involving customers in the management of peak demand. In this paper we argue that energy is used through social practices and our analysis shows that some practices are more flexible (and therefore more relevant to the peak demand debates) than others.

Peak Practices

This note summarises the findings of a more detailed paper which reports on the qualitative research conducted with CLNR trial participants to investigate which practices they perform in the peak periods and how flexible these practices are or might be.

We argue that peak demand is constituted through a multiplicity of practices, some of which can be identified as being associated with significant energy use on the peak period (defined as 4pm—8pm, Monday to Friday).

A list of groups of practices has emerged as most directly relevant to peak demand management debates as a result of the combination of several factors — likelihood of being performed the peak period, electrical load, and popularity of technology ownership. The authors conducted an analysis of these factors using the qualitative data collected as part of CLNR and through reference to the CREST model of domestic electricity consumption (Richardson & Thomson 2010). These groups of practices were identified as being of most direct relevance to debates around enrolling customer flexibility into the management of peak demand on this basis: **electronic entertainment, cooking and washing up, laundry, other household chores, refrigeration, bathing.**

Of these practices, we focus in this paper on contrasting the flexibility of laundry and dish washing practices with the relative inflexibility of cooking and dining practices. We draw out three factors which we argue affect the ways in which practices respond to the intervention of a time of use tariff. We argue that studying how practices such as these respond to and evolve with infrastructural demand management interventions is an important part of optimising future interventions which, “necessitate repositioning and blurring the roles

and responsibilities of resource providers and consumers” (Strengers 2011).

Contrasting Flexibilities

The analysis of qualitative data suggests that domestic practices are not equally flexible – some responded to the tariff intervention while others did so either far less or not at all. Furthermore, there is enough consistency between households for us to conclude that laundry, household chores and dish washing practices were being performed differently as a result of the introduction of the tariff intervention. Examples of customer comments illustrate this:

“...if at 4 o'clock if we haven't finished drying then we stop then and pile it up usually just put it on the back of the chair and wait 'til 8 o'clock and then we'll finish it then because the dryer's expensive to run.”

“We try and do washing on a weekend or after 8. ... The dishwasher doesn't go on 'til after 8 now either ... before we got the [IHD/tariff] we would just put it on when it needed to go on.”

In contrast, the least flexible of the practices we focussed on was dining, and in particular the evening meal was for the majority of households a fixed feature in their early evening as these responses to questions about flexibility illustrate:

“Participant: Obviously, not our tea ... but [I] wouldn't put the dishwasher on [between 4-8], or the washing machine or dryer.”

“Participant: With the exception of cooking, I think you'd have to draw the line there.”

Analysis

The time of use trial has provided a valuable insight into how intervening in everyday life is not a straightforward matter and more specifically for the demand management debates that accompany smart grid discourses, that flexibility is more a property of practices than people.

We suggest that laundry, dish washing, dining and cooking practices are different in terms of their flexibility for two reasons. First, laundry can be performed at any time an individual chooses, whereas cooking must often be coordinated with other schedules, such as work and school, meaning that there are more constraints - and these constraints come from outside the home.

Secondly we suggest that the evening meal is a meaningful event for households and one which is 'heavy' with associations whereas laundry practices are much less meaningful, and as a result 'lighter' - and more easily movable.

References

- Strengers, Y., 2011. Beyond demand management: co-managing energy and water practices with Australian households. *Policy Studies*, 32(1), pp.35–58.
- Richardson, I. & Thomson, M., 2010. Domestic electricity demand model - simulation example. *Loughborough University Institutional Repository*. Available at: <https://dspace.lboro.ac.uk/2134/5786>.