

## Normalising flexibility in demand: learning from peaks

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A foundational contention of [the DEMAND Centre](#) is that energy is not used for its own sake but as part of accomplishing social practices at home, at work and in moving around (Shove & Walker, 2014). By implication, energy policy is not just about supply, distribution networks and smart grids but also includes all the policies that influence the billions of energy demanding actions which comprise everyday life. Such a re-framing renders energy policy as a hugely complex, far reaching, cross-sectoral and messy topic, and it makes energy, like climate change, a wicked or 'super-wicked' problem in policy terms (Levin, Cashore, Bernstein, & Auld, 2012). As Deborah Stone (1989; 289) suggests, "Images of complex cause ... postulate a kind of innocence, in that no identifiable actor can exert control over the whole system or web of interactions... Complex causal explanations are not very useful in politics, precisely because they do not offer a single locus of control, a plausible candidate to take responsibility for a problem, or a point of leverage to fix a problem."

Acknowledging that the realm of action that affects energy demand clearly extends beyond the state and governance does not prevent us from asking how we can usefully address the ratcheting up of demand.

Part of the challenge here is that energy demand is such a broad topic. How then do we decide on which parts of demand to focus? Peaks in demand have always provided a more tangible focus, especially when the relation between demand and supply matters. There are recognised debates about the potential for reducing peak demand and these raise the question of which aspects of demand within these peaks are 'negotiable', and to what extent they can be 'shifted' (Mattioli, Shove, & Torriti, 2014; Torriti, 2017). Examples include voluntary demand response initiatives in industry (Torriti, Hassan, & Leach, 2010) and consumer demand management schemes designed to limit demand for air conditioning at times of peak load in Australia (Strengers, 2010).

As we move to an increasingly diverse supply mix with greater use of intermittent renewables (DECC, 2013; Trutneyte, McDowall, Tomei, & Keppo, 2016) it may become increasingly difficult to guarantee a balancing of supply and demand and in such situations the temporal flexibility of sources of demand is likely to become more important.

The next few examples illustrate other ways of thinking about the flexibility of demand.

Refrigerators and freezers are highly normalised and standardised within the home and in cold chains in the UK. As appliances that are continuously switched on, they make a major contribution to baseload electricity demand. Contrary to other cooling devices such as air conditioners, they do not contribute to peaks in demand, but instead normally use a consistent amount of energy throughout the day and the year. So could refrigerators have a role in demand reduction at times of peak load? For example, would it be possible to temporarily switch such appliances off at critical moments? Given that fridges and freezers are typically packed with food, switching them off for long periods would require changes in practices of provisioning and cooking, of shopping for and storing food. Some options might include:

- Freezers which are designed to be switched off or have limited chilling for specified periods;
- Fridges which are divided into sections some of which are colder than others;

- The re-working of products such that refrigeration is not needed to maintain food in a 'good' and 'fresh' state
- Vending machines which can have chilling switched off.

Some of these options may require the redesign of products. Demand [research in SE Asia](#) shows that fridges with five different compartments capable of chilling food to different temperatures already exist. Whether and how these might be employed to reduce demand remains to be seen. Yet the broader point is clear: there are ways of reconfiguring systems of food provisioning to enable shifts in the 'baseload' associated with keeping food cool.

Similar reasoning can be applied to other elements of baseload demand such as lighting. In some places, streetlights are already turned off in the middle of the night<sup>1</sup>, and some supermarkets dim lights overnight even when operating as 24 hour stores (Acha, Nilay, Ashford, & Penfold, 2012). As these examples suggest, there is scope for flexibility even in what is considered to be baseload demand.

We might also look at areas where supply and demand are already being dynamically managed and where we might capitalise on the normalisation of flexibility. Such ideas have been debated for fifty or more years or more in transport in the context of urban and, more recently, inter-urban congestion. To date, only a handful of cities have deployed congestion charging schemes which require drivers who access the most congested parts of cities to pay an additional fee (Eliasson, Hultkrantz, Nerhagen, & Rosqvist, 2009; Santos, 2005), in part because these schemes are often seen as expensive to implement and politically risky (Isaksson & Richardson, 2009).

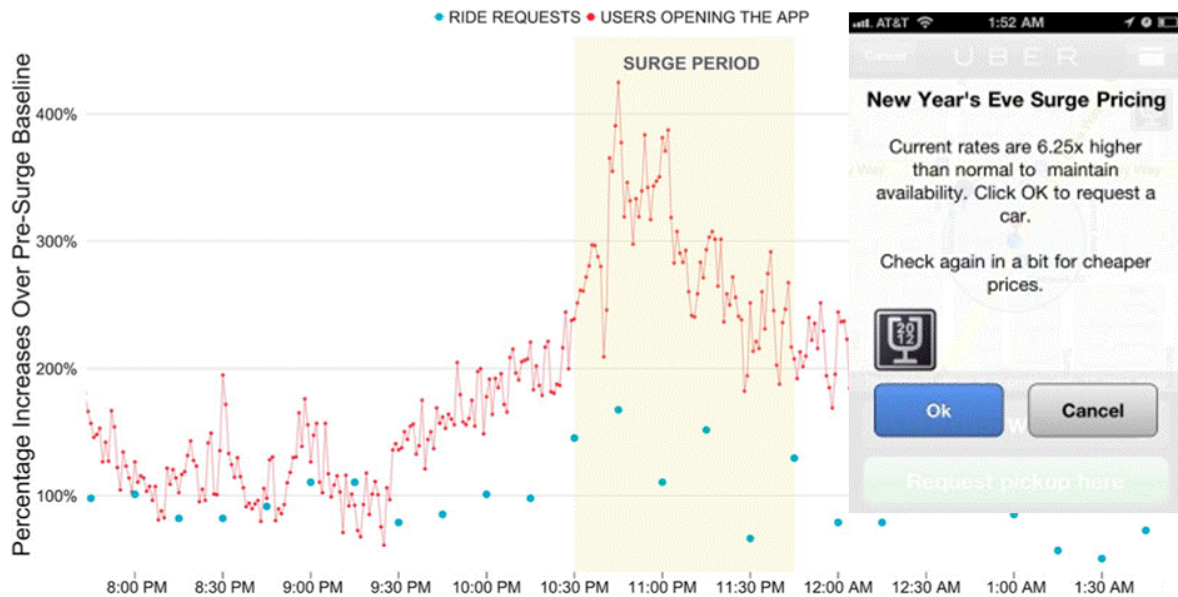
However, other developments are underway which suggest a broader normalisation of flexibility during peaks, or at least some sorts of peaks. Uber – the world's largest ride-sourcing platform – reports over one million rides undertaken every day, and over 8 million registered users.<sup>2</sup> Uber's surge pricing system dynamically varies the cost of travel based on the levels of demand within a local area.<sup>3</sup> Such an initiative bypasses the infrastructural requirements of traditional road pricing schemes. As this example suggests, there might be a variety of ways of normalising peak shifting initiatives with a range of different organisations involved in such endeavours.

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<sup>1</sup> Streetlights have been turned off or dimmed in 75% of English council areas by 2014, although generally for cost-cutting rather than environmental reasons. <http://www.bbc.co.uk/news/uk-politics-30569215>

<sup>2</sup> <http://expandedramblings.com/index.php/uber-statistics/>

<sup>3</sup> <http://www.telegraph.co.uk/technology/news/11873685/Why-Ubers-surge-pricing-is-good-for-you-according-to-Uber.html>



Uber's surge pricing. [Images from Daily Telegraph and <http://connectingthecircles.blogspot.co.uk/2012/11/the-surge-that-caused-surge.html>]

Our argument is that peaks are crucial moments at which demand is problematised for a range of energy and non-energy reasons. Initiatives to manage demand in peaks are especially interesting in that they normalise the flexibility of some aspects of demand. Some of this flexibility can be mobilised outside times of peak demand meaning that potentially innovative responses to the 'peak' might also be used to reduce baseload, and demand in general.

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