

ENA Open Networks Project: Flexibility Consultation 2021 – A response

Consultation Documents: <https://www.energynetworks.org/creating-tomorrows-networks/open-networks/flexibility-services>

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Note on responses

We have only responded to questions where we can offer expertise.

Residential Flexibility

Q20 – Do you have any ideas on how we might better engage and encourage participation of residential flexibility in flexibility service provision and identify any barriers that might currently exist along with potential solutions?

This issue was discussed in depth in our response to the 2020 consultation [1]. We organised our comments under four headings:

- Lack of capacity to invest:
- The impotency of price
- ‘Non-rational’ choices
- Systemic barriers and solutions

Our thinking on this issue has developed over the last 12 months and was described in detail in a recent [blog post](#) for the Centre for Research into Energy Demand Solutions [2]. To summarise our current view:

- Inherent in much, although not all, of the current work on electricity system flexibility is the notion that we need to find ways to enable flexibility at the consumer end of the line.
- In energy research in general, this is often simplistically translated into a form of congestion-based charging. Here, price signalling via variable time-of-use tariffs will ‘naturally’ incentivise cost-optimising and economically rational domestic consumers to reduce and/or shift (flex) their demand in expensive (peak) demand periods.
- Can variable pricing deliver flexibility? The evidence is not strong: Recent [reviews](#) of responsiveness to price and [non-price](#) or [combined](#) incentives suggest that we can expect demand reduction of at most 5-15% with substantial variation between households and across studies. We should expect consumer-wide impacts to be at the lower end of this range as many of the reviewed studies used self-selecting and thus biased samples of consumers who were [more likely to respond to incentives](#). We also know that consumers are particularly price insensitive in the evening peak period although there are indications that this varies by [social group](#). Using price incentives may also lead to undesired effects, for example increasing demand outside of critical peak events, thus [increasing peaks at other times](#).
- We could continue to hope that variable pricing will deliver system flexibility and redouble our efforts to ‘engage’ the customer base. “*Surely they would make the ‘right’ decision(s) if we but gave them the ‘right information’, the ‘right graphics’ or a ‘better dashboard’?*”. Or would they? [Nicholson’s](#) research suggests not – the ‘information deficit’ model is looking increasingly outmoded.
- Further, will the consumers who are likely to benefit self-select into the ‘best’ tariff for them as many in the sector, including in regulation, appear to believe? On this evidence, probably not.
- Perhaps we really do need to admit that consumers are generally [not rationally acting cost optimisers](#). Expecting flexibility to emerge from the ability of residential customers to actively shift or adjust their real-time patterns of energy demand in response to anything other than punitive pricing appears unrealistic. Further, if there is some doubt as to whether informed choices are

(correctly) made even with full information and support, effective commercial services, policy and regulation cannot end with this assumption. A different approach is required.

- So who needs flexibility anyway? Is it the system, or the consumer? If the former, how can we nurture system flexibility without the apparently [troublesome need](#) to directly engage consumers in a ‘flexibility market’ at all?
- Substantially greater demand reduction might be secured where the consumer is not even aware that their demands on the system are being flexed. This is not news – decoupling demand from supply is equivalent to energy storage, but of course this doesn’t need to be direct storage of electrical energy. Flexibility solutions may be found in a range of socio-technical arrangements (products + practices) that provide automated demand response/direct control or otherwise de-couple energy use from energy demand. These include thermal (heat/cool/hot water) storage of various kinds, available in the thermal mass of many dwellings, and further enabled by building fabric upgrades and technologies such as heat batteries, phase-change materials and those hot water tanks we have been so keen to remove over the last 20 years.
- Interestingly, these approaches feature strongly in the recently published UK Government [smart systems and flexibility plan](#) which concludes that “smart charging of electric vehicles and heat pumps combined with heat storage provide the largest potential for DSR [demand side response]”. The plan assumes that domestic smart appliance-based flexibility can deliver a mere 3% demand reduction in a given half hour. In contrast various forms of thermal flexibility offer up to 20% while smart EV charging can deliver up to 90%. What need here for consumers responding directly to variable price tariffs?
- This approach reduces exposure to price ‘shocks’ of the kind that impacted [Flick energy’s](#) wholesale half-hourly price-following tariff. The latter demonstrated that rather than respond to sharp variable price tariff rises by reducing demand, the majority of customers simply switched (back) to a flat tariff supplier causing Flick to lose substantial market share in a very short space of time.

In summary:

- Perhaps the flexibility ‘solution’ is not therefore the mythical engaged, actively optimising price responsive consumer but optimisation based on automation where households are not expected to have to [micro-manage \(or resist\) energy decisions](#).
- Perhaps the flexibility the system actually needs requires [active disengagement](#) so that the grid ‘sees flexibility’ but consumers can get on with their everyday lives?
- Clearly this means **considering flexibility as a property of a wider system** that includes dwelling fabric (for thermal storage) as well as the bounded electricity network and its connected appliances. This may mean partnering with construction and renovation service organisations as well as ‘energy service’ providers to enable a systemic approach.
- *We are concerned that the current conception of flexibility (and flexible services) may preclude this as an outcome of the open networks flexibility project.*
- If ‘active disengagement’ is the desired approach, the issue of potential injustices through unequal flexibility capital remains an important concern.

But on the other hand it may advantage vulnerable consumers who can invisibly benefit from the auto-trading of their flexibility capital.

- What stake will consumers require in this emerging system in order to consent to differing levels of automation, and what level of control will they need – or want – to retain? Will a new ‘[social licence to automate](#)’ be required?

References

- [1] B. Anderson and T. Rushby, ‘ENA Open Networks Project: Flexibility Consultation 2020 – a response’, Sep. 25, 2020. <https://eprints.soton.ac.uk/444175/> (accessed Oct. 29, 2020).
- [2] Ben Anderson and Tom Rushby, ‘Who needs flexibility anyway?’, Aug. 25, 2021. <https://www.creds.ac.uk/who-needs-flexibility-anyway/> (accessed Oct. 08, 2021).