

EDRC & CREDS response to: Engaging domestic consumers in energy flexibility – Call for Input

About EDRC and CREDS

EDRC (the Energy Demand Research Centre) aims to inform and inspire energy demand reductions that support an affordable, comfortable and secure Net Zero society. Collaborating with partners across policy, industry, civil society and academia, EDRC will deliver a world-leading transformative and interdisciplinary research programme that identifies and shapes evidence-based energy demand solutions for a sustainable and more equitable future. The Energy Demand Research Centre is supported by the Engineering and Physical Sciences Research Council and the Economic and Social Research Council [grant number EP/Y010078/1].

CREDS (the Centre for Research into Energy Demand Solutions) is a research centre established in 2018 with a vision to make the UK a leader in understanding the changes in energy demand needed for the transition to a secure and affordable, low-carbon energy system. Working with researchers, businesses and policy makers, our work addresses a broad range of issues. CREDS responds to consultations and calls for evidence from government, agencies and businesses, providing insight and expertise to decision-makers. The Centre for Research into Energy Demand Solutions is supported by the Engineering and Physical Sciences Research Council and the Economic and Social Research Council [grant number EP/R035288/1].

This response was written on Behalf of EDRC and CREDS by:

- Professor Jacopo Torriti, University of Reading - Flexibility theme lead, EDRC & CREDS
- Professor Elizabeth Shove, University of Lancaster - CREDS
- Dr Michael Fell, University College London – EDRC & CREDS
- Dr Jose Luis Ramirez-Mendiola, University of Reading – EDRC & CREDS

General comments on the call for input

We welcome the interest in developing a better understanding of what is needed in order to unlock domestic consumers' engagement in energy demand flexibility, as well as enable consumers to transition from passive billpayers to active, flexible energy consumers.

This fundamental shift in the role of domestic consumers will not come without significant challenges. Nevertheless, it is essential that such challenges are surmounted if we are to tap into the vast demand flexibility potential that the domestic sector can offer.

Questions

Q2 – Do you think consumers and the system will have greater benefits if DSR is provided as a household proposition or as a service through individual assets (EVs, Heat Pumps)?

We agree with your approach of keeping an open mind here, as both kinds of arrangements have the potential to deliver equally great benefits. There is, however, no one-size-fits-all solution here, so it is likely that a combination of two or more kinds of arrangements could result in greater benefits overall. On the face of it, a household arrangement that captures all relevant ESAs has greater potential for benefits, given that it would allow for harnessing more flexible loads within the household. However, it is plausible that offerings directly associated with ESAs receive uptake by more households (due to their ease of adoption), meaning the overall amount of load usable for DSR (and therefore household/system benefit) would be higher. Research by Watson et al. (2020¹, 2022²) suggests high levels of demand amongst consumers to be able to contract with multiple energy suppliers – an arrangement which could facilitate more ESA-based DSR.

Nevertheless, as you pointed out, it is also very important to consider what might be required in the short, medium and long term because, as consumer trust in and literacy of DSR services increases, it is likely that more consumers will be willing and able to engage, and engage more, provided that they are able to find the kind of arrangements that suit them best.

Q3 – How do you envision consumer relationships and engagement will change through the introduction of DSR?

We believe that this question can be approached from two, fundamentally different angles.

One school of thought suggests that the concept of 'the consumer' and his or her 'engagement' is misplaced, and that rather than being agents of choice, individuals are in various ways locked into shared conventions of what constitutes 'normal practice', which is sustained and reinforced by

¹ Two energy suppliers are better than one: Survey experiments on consumer engagement with local energy in GB - <https://doi.org/10.1016/j.enpol.2020.111891>

² One supplier or two? Choice experiments on UK consumer preferences for business models with Multiple Electricity Suppliers - <https://doi.org/10.17605/OSF.IO/NTGWK>

infrastructures and providers. If we go along with this view, the debate about consumer engagement is something of a distraction (Shove, 2010)³. Instead, more powerful and more plausible lines of enquiry could and should focus on the entire ‘ecology’ of provision and infrastructure and on how changes in systems of provision relate to conventions and practices that matter for energy consumption, at scale (Blue, Shove and Forman, 2020)⁴.

Another school of thought, which aligns with the ABC (attitude, behaviour and choice) model³, accepts that introducing DSR will add an important new area of engagement to the relationship between consumers and energy/DSR suppliers. Suppliers will be much more strongly involved in the level of energy service quality that consumers receive (as compared to simply supply of energy). Service quality depends on factors such as timing and nature of the energy service provided (e.g. when heat is provided, at what level, by what means). As you suggest, trust is likely to be key, especially in the context of automated DSR. Research by Fell et al. (2015)⁵ has demonstrated a link between trust in supplier and willingness to participate in DSR offerings. We might speculate that a supplier who performs their DSR role acceptably and effectively could use this as a way of building trust amongst their customers.

It is important to consider that just because DSR is automated, this does not mean it is invisible to the consumer. The extent to which automation “fits” with households’ activity patterns is likely to be extremely important. Our previous research (Sweetnam et al., 2018)⁶ has indicated that automated DSR of heating can be acceptable or unacceptable depending on how well it aligns with existing household lifestyles.

Q4 – How do you think consumers should be engaged on the nature and value of DSR? Do you think different consumer archetypes need to be engaged in specific ways, if so, which archetypes and how?

Again, we believe that the answers to these questions very much depend on how the process of *consumption* is conceptualised. As framed, the question supposes a) that consumer engagement is important; and b) that consumers vary, systematically, as regards the nature of this engagement.

If we subscribe to this view, then we must acknowledge that both the nature and value of DSR will necessarily vary for different consumers. Therefore, the way consumers are engaged will also be largely determined by these differences. Any consumer archetypes need to look closely at, and arguably be *based on* how people's routines and the timing of their activities relate to when they use energy. Research by Torriti et al. (2020)⁷ and Ramirez-Mendiola et al. (2022)⁸ has focused on domestic consumer segmentation on the basis of the degree of similarity in their typical activity patterns, which might provide some insight regarding how to approach this. The results show that consumers who are locked-in because of scarce time availability and lower income might not be able

³ Beyond the ABC: Climate Change Policy and Theories of Social Change - <https://doi.org/10.1068/a42282>

⁴ Conceptualising flexibility: Challenging representations of time and society in the energy sector - <https://doi.org/10.1177/0961463X20905479>

⁵ Knowing me, knowing you: the role of trust, locus of control and privacy concern in acceptance of domestic electricity demand-side response - <https://discovery.ucl.ac.uk/id/eprint/1476671/>

⁶ Domestic demand-side response with heat pumps: controls and tariffs - <https://doi.org/10.1080/09613218.2018.1442775>

⁷ It's only a matter of time: Flexibility, activities and time of use tariffs in the United Kingdom - <https://doi.org/10.1016/j.erss.2020.101697>

⁸ I'm coming home (to charge): The relation between commuting practices and peak energy demand in the United Kingdom - <https://doi.org/10.1016/j.erss.2022.102502>

to reap the benefits of DSR. A follow-up study by Yunusov et al. (2021)⁹ makes use of activity-based clustering and finds that the distributional effects of Time of Use tariffs reveal regional differences (e.g. positive effects for high income groups in London) and household composition similarities (e.g. positive effects for households with children not in the high-income group).

In addition to the differences in everyday routines, if we explicitly acknowledge the pervasive social inequities at present, it is also possible to consider this issue through the lens of flexibility capital. As we have described (Powells and Fell, 2020)¹⁰, households' *capacity to provide* demand flexibility can be considered as falling somewhere on the following quadrants:

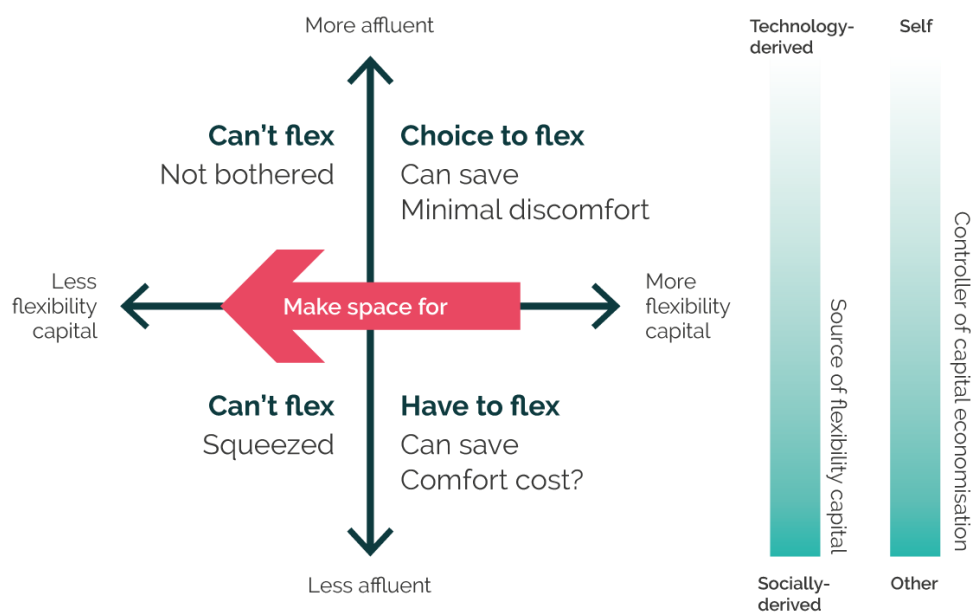


Figure 1 - Implications of different combinations of flexibility capital and affluence (from <https://www.creds.ac.uk/how-fair-is-flexibility/> -- see that article for a brief explanation).

Thinking in this way suggests different factors could be important depending on where households fall in the quadrant. For those households to the left, the focus should be relatively more on building the ability to be flexible, while for those on the right it should be about unlocking flexibility. For example, a household to the left may be more effectively engaged through the offer of a Heat as a Service (HaaS) product, where provision of a heat pump (building capital) is bundled with the delivery of a given level of service, which is achieved through automated heat pump operation that includes DSR. On the other hand, for a household on the right, while HaaS would still be appropriate, they may be better positioned to take advantage of a Time of Use tariff.

Regardless of the approach, good engagement practice would probably suggest not forcing too much information upon people, but making sure it is easily accessible should they wish to find it.

⁹ Distributional effects of Time of Use tariffs based on electricity demand and time use - <https://doi.org/10.1016/j.enpol.2021.112412>

¹⁰ Flexibility Capital and Flexibility Justice in Smart Energy Systems - <https://discovery.ucl.ac.uk/id/eprint/10071036/>

If we subscribe to an alternative view, however, one which rejects the question's premise (i.e. that consumer engagement is important, and that consumers vary, systematically, as regards the nature of the engagement), there is by now a considerable and well-established literature in the social sciences that can support this approach. Shove and Warde (2002)¹¹ provide a comprehensive introduction to this view. In light of these ideas, it would make more sense to focus on when, whether and how DSR impinges on the routine reproduction of shared expectations and conventions. For example, are such schemes designed to deliver 'current levels of service' and perpetuate what might well be unsustainable ways of life, or – by contrast – is the aim to modify societal rhythms and the scheduling and timing of daily life, including meal times, what happens during 'the evening', the weekend, and so forth. If this was the chosen route, there would be scope for significant intervention across a variety of policy areas. This is so in that timing and scheduling is tied up with transport policy, employment policy, education policy and more (Royston, Selby and Shove, 2018)¹².

The much more limited framing of the question in the call generates correspondingly limited responses that focus on consumers, or groups of consumers (so-called archetypes), in isolation from wider trends in society, and that treat consumer's actions as if they were discrete and identifiable responses to 'price signals' or some other input. There are, of course, variations in how households react, and in the extent to which they are, or are not, locked into immovable sets of practices. The real prize lies in understanding flexibility not as a feature of individuals or households, and not as a feature of some practices (e.g. laundry), but as a relational feature of how *many* everyday practices combine – and how these combinations evolve over time.

Q5 – What will the primary motivators be that will encourage consumers to engage with DSR? Do you think these motivators will differ depending on consumer group?

The premise of this question is that engagement is an outcome of 'motivators'. This would entail that motivations are an input to - rather than a consequence of - social life, and this is arguably the wrong way around. Whilst this is consistent with various strands of psychology and economics, these assumptions (e.g. that behaviour is driven by motivation) are not compatible with more systemic theories of social life and social action. From this point of view, so-called motivations are not independent 'driving factors'. People can and do talk about their motivations, and these are, indeed, part of and outcomes of the social activities in which they engage.

If, on the other hand, we subscribe to the view that engagement is an outcome of external motivators, there would still be every reason to believe that what motivates a segment of the population might not another, and vice versa. A more nuanced view would at least consider that the extent to which something is a 'motivator' falls within a certain spectrum, which ideally would reflect people's susceptibility to such motivator.

¹¹ Inconspicuous consumption: the sociology of consumption, lifestyles and the environment - <https://eprints.lancs.ac.uk/id/eprint/25816/>

¹² Invisible energy policies: A new agenda for energy demand reduction - <https://doi.org/10.1016/j.enpol.2018.08.052>

Q6 – To what extent should the system wide benefits provided by DSR be shared amongst all consumers, even those who are less engaged or do not participate in DSR at all?

At the system level, it is hard to imagine a scenario where any potential benefits of DSR should not trickle down to most consumers. Those households which do participate in DSR will necessarily experience more direct and immediate benefits through, say, avoidance of peak pricing. There are, however, certain indirect benefits of DSR which are likely to be socialised somewhat inevitably because, for example, any generation and network investment costs avoided as a result of DSR are likely to benefit all customers. Nevertheless, regulation will have some role in determining the extent to which some charges are socialised. For example, a flat network charging approach would fully socialise all network savings, while a tiered charge would return more direct benefits to flexible consumers.

In any case, we argue that the starting point should be that any measures that provide consumers with the *opportunity* to get access to the direct benefits of providing DSR must be maximised.

Unless this opportunity is maximised, inflexible consumers would not only lose out on direct benefits, but could also be inadvertently hit under more cost-reflective approaches to network charging. So, the extent to which system wide costs are shared amongst all consumers should be in proportion to the extent to which opportunity to provide flexibility has been maximised – such as through support schemes and regulation to permit business models which improve access to relevant technologies and services.

Part of EDRC’s research over the next 5 years will focus on how access to the benefits of flexibility provision can be maximised, and we would be keen to engage further on this topic with you.

Other questions worth exploring include fundamental issues about the extent to which DSR is a ‘conservative’ measure (reproducing the status quo in terms of timing and consumption) or whether it can be, or can be made to be, unsettling. On a societal scale, decreasing the level of synchronisation (when many people do the same thing at roughly the same time) could generate quite new social and temporal arrangements, including differences, forms of valuation and of course, patterns of energy demand.

Q7 – How can the customer journey in domestic DSR be made simple and seamless?

While we welcome the interest in understanding how the ‘customer journey’ could be made simple and seamless, we believe we should also be prepared to devise strategies aimed at persuading and incentivising customers to embark on a journey which requires some amount of effort, in exchange for proportionate rewards. In this sense, prior to what you referred to as the ‘building interest’ stage, there should be a ‘building trust’ stage that should focus on establishing rapport and better understanding the reasons for doubt and scepticism. As the results of the HOMEflex revealed, one of the main issues is the lack of understanding of both what engaging in flexibility would entail, and what the value/benefits are.

Beyond the issues you mention, it seems important to also highlight the role of consistency and interoperability. Consumers may well end up having to deal with a variety of different DSR operators, both simultaneously and over time. Consistency of terminology will help make the space more

‘navigable’. Device interoperability will help ensure not only the ongoing provision of DSR, but also mitigate reluctance of consumers to invest in DSR-related products that they are worried would become obsolete with a change of operator.

Q8 – Do you agree that these factors are important in ensuring an attractive and simple domestic customer journey in DSR is realised? Are there any other factors that should be considered?

The premise of this question subscribes to the view that a given set of factors which have an impact on an outcome must be identified *a priori*. If we follow along with this view, then the factors considered are indeed important. The starting point, however, must be pushed back further.

The extent to which information is ‘accessible’ depends not only on how easy it is to reach such information, but also on whether the information can be assimilated by the target audience. The fundamental shift in the role that consumers are expected to play in a system where they must engage with DSR necessarily entails that there will be a certain learning curve they will need to climb. We should ensure that appropriate support for this is also put in place.

A further factor (or criterion) we believe will be important is “inclusivity”. There needs to be a proactive approach to making sure that opportunities to benefit from flexibility are designed and made accessible to as wide a spectrum of the population as possible. This is important not just for reasons of fairness, but to help maximise the amount of flexibility that is ultimately available, and to help maintain the social contract for Net Zero which will require that vulnerable groups do not get left behind. We believe this goes beyond the “choice”, “protection”, and “accessible information” factors you have already included and is worth pulling out explicitly.

Another factor that could be worth highlighting more explicitly is trust. Again, this is perhaps implicit in some of the other factors, but for reasons explored above we expect it to be key – so mechanisms to help build and maintain it will be influential in supporting the consumer journey.

There are different theories about how the social world works, and this is not the only one. In simple terms, the alternative is an ‘emergent’ rather than a ‘driven’ model of change. From this perspective, how social life – and electricity use – develops cannot be attributed to external forces and factors. Instead, and as historians know, combinations of practices set the scene in which others develop. This is a constantly shifting tapestry of ‘prefiguration’ in which what might seem like causal factors are, in fact, part of a fluid and always situated complex of relevance, irrelevance and inherent indeterminacy.

Q9 – What barriers do you see to these factors in the domestic DSR customer journey being realised in practice?

In addition to the issues around the concept of ‘information accessibility’ raised in the answer to the previous question, there are also some clear barriers in regulation. For example, the inability of consumers to contract with multiple energy suppliers will limit choice. Workarounds can be found for this via aggregator arrangements, but it will likely be a source of friction.

The issue of control could become quite nuanced. For example, it is possible to imagine flexibility offerings which limit override ability in order to ensure reliability, in return for a more competitive price to the customer. How such limits on control are communicated will need to be fair and clear.

Regarding choice, a balance will need to be struck between this and the requirement of suppliers to rely on longer-term contracts for some offerings, such as those which come with large capital investments. Again, communication of what is being committed to will be key here. Care will also need to be taken in relation to opt-in vs opt-out arrangements. Our previous evidence review work has highlighted the potentially significant role of opt-out approaches in flexibility participation¹³. However, there are clearly risks here if the ability to opt out, and the implications of doing so, are not clearly communicated.

An important thing to note, and pay close attention to, is that it is useful and relevant to pause for a moment and think about this language around barriers. Policy documents frequently refer to intentions and barriers to their realisation in practice. By implication, barriers get in the way, or complicate otherwise seamless impact. On closer inspection, barriers often turn out to be quite ordinary features of the social world that have been omitted or overlooked in policy analysis (Shove, 1998)¹⁴. This leads to a different way of ‘reading’ proposals and schemes, and to paying attention to what it is they omit, or take for granted, or overlook. Ironically, the rhetoric of ‘the consumer journey’ might well be a good example. This discourse supposes a discrete consumer who has a specific path, or journey. But what if that’s not a plausible account? In that case, the language of barriers provides a useful explanation of why things don’t turn out as expected. For example, barriers might include consumers’ ‘unwillingness’ to respond to price signals. This is itself an outcome of subscribing to a model of factors, drivers, beliefs and consumer choice. Other approaches would not face such ‘barriers’: instead, apparent failure to respond would be a simple and quite understandable outcome of the fact that practices are held in place by an array of conventions, technologies and societal rhythms.

As this example suggests, interpretations of ‘barriers’ need to be read backwards, that is, they need to be read again to see what judgements they make about the social world and how it works.

Q10 – What do you think is the role of government, Ofgem, industry and stakeholders in enabling an attractive and simple customer journey in domestic DSR?

As a starting point, they should all ensure that any information about demand flexibility and DSR should be made accessible not only in terms of reachability, but also, more importantly, in terms of assimilability. It will also be important to monitor the extent to which different segments of the population are accessing the benefits of providing flexibility. Collecting such data should be a requirement of service providers, reporting to Ofgem according to agreed criteria. This data can be used to inform any policy or regulatory intervention that may be required from Government or Ofgem.

¹³ Consumer demand for time of use electricity tariffs: A systematized review of the empirical evidence - <https://doi.org/10.1016/j.rser.2018.08.040>

¹⁴ Gaps, barriers and conceptual chasms: theories of technology transfer and energy in buildings - [https://doi.org/10.1016/S0301-4215\(98\)00065-2](https://doi.org/10.1016/S0301-4215(98)00065-2)