

Citizens Advice: Towards a smart, flexible energy system

A response to BEIS' and
Ofgem's call for
evidence

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Introduction

This document contains Citizens Advice's response to the [call for evidence](#)¹ from the Department for Business, Energy and Industrial Strategy (BEIS) and Ofgem on "a smart, flexible energy system". Citizens Advice have statutory responsibilities to represent energy consumers in Great Britain in accordance with the 2007 Consumers, Estate Agents and Redress Act.

We greatly welcome this joint call for evidence as it puts a timely focus on the fast-changing UK energy system. As the country is striving to meet its emission reduction targets, more intermittent and distributed generation has been connected to the grid, which has brought with it challenges related to balancing the system. New technological developments such as electricity storage, electric vehicles, smart meters, and automated demand side response (DSR) bear great promise but are either still too costly to reach a mass market or have been held up by technical difficulties. This has left the UK behind the USA, Canada and China in terms of moving towards a smarter, more flexible energy system.

Whilst this consultation covers many topics which are relevant to addressing these challenges, we are concerned that its structure may end up missing both the bigger opportunities and the bigger problems in the move to a smarter, more flexible energy system. There is a risk that by narrowly dividing questions into different technologies, actors and policies, the overlaps and conflicts between them may be missed. Furthermore, the challenge Government faces will not be to devise a policy that is good for storage, for example, or which supports aggregators, or accurately prices system costs of intermittent generation. Rather, the challenge is to devise a suite of policies that achieve all these things, combining a multitude of incentives, causes, and possible solutions without picking winners and losers, that can take account of changing tech trends, market conditions and future consumer behaviour, and that keep the cost burden on consumers low.

As it is still at an early stage, we do not expect immediate answers to these very difficult questions. But it would be helpful to have a clearer indication of the Government's and regulator's plans, and how they intend to weave these separate threads into a cohesive garment.

In our 25 responses to BEIS' and Ofgem's questions we have drawn on our experience as an energy champion and advice charity. Last year we helped fix 208,000 energy problems through our local network and our helpline.

¹ A smart, flexible energy system: A call for evidence (2016) Ofgem, BEIS
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/576367/Smart_Flexibility_Energy_-_Call_for_Evidence1.pdf

We have conducted research and published reports on multiple topics related to smart and flexible energy systems, including consumer [attitudes to energy data privacy](#) (2014)², [smart appliances](#) (2015)³, [low carbon generation policies and what they cost consumers](#) (2015)⁴, [vulnerable consumers and the smart meter rollout](#) (2015)⁵, [early consumer experience of smart meters](#) (2016)⁶, [distribution tariff design](#) (2016)⁷, [disruptions to the energy industry and their effects on consumers](#) (2016)⁸, and we are currently conducting research into time of use tariffs and their system and customer benefits.

Throughout our responses, our arguments are based on fundamental principles and values, supported by evidence, that we believe should guide the UK's transition towards a smarter, flexible energy system. Below is a summary of these principles with examples of how we have applied them to different issues covered in our consultation responses:

- **Limiting costs to consumers:** for example when deciding which governance regime to put in place for aggregators;
- **Consumer protection:** to limit the liability of early users of smart tariffs who find they do not work for them;
- **Transparency:** to ensure consumers are clear on who uses the data generated by their smart appliances, when and why;

² Smart and clear: Customer attitudes to communicating rights and choices on energy data privacy and access (2014) Consumer Futures
<http://webarchive.nationalarchives.gov.uk/20140728011208/http://www.consumerfutures.org.uk/reports/smart-and-clear-customer-attitudes-to-communicating-rights-and-choices-on-energy-data-privacy-and-access>

³ Policy briefing: Energy saving and smart appliances (2015) Citizens Advice
<https://www.citizensadvice.org.uk/Global/CitizensAdvice/Energy/PolicybriefingSmartappliances.pdf>

⁴ Generating Value? A Consumer Friendly Electricity Generation Policy (2015) Citizens Advice
<https://www.citizensadvice.org.uk/Global/CitizensAdvice/Energy/GeneratingValue.pdf>

⁵ Vulnerable consumers and the smart meter rollout: Analysis of information request (2015) Citizens Advice
[https://www.citizensadvice.org.uk/Global/CitizensAdvice/Energy/IRsmartmetersandvulnerableconsumers%20\(1\)%20\(1\).pdf](https://www.citizensadvice.org.uk/Global/CitizensAdvice/Energy/IRsmartmetersandvulnerableconsumers%20(1)%20(1).pdf)

⁶ Early consumer experiences of smart meters (2016) Citizens Advice
<https://www.citizensadvice.org.uk/Global/CitizensAdvice/Energy/Energy%20Consultation%20responses/Early%20consumer%20experiences%20of%20smart%20meters%20-%20Research%20summary.pdf>

⁷ Tackling Tariff Design: Making distribution network costs work for consumers (2016) Citizens Advice
<https://www.citizensadvice.org.uk/Global/CitizensAdvice/Energy/Energy%20Consultation%20responses/Tackling%20Tariff%20Design.pdf>

⁸ The disrupted decade: 4 disruptions that will shake things up for energy consumers (2016) Citizens Advice
<https://www.citizensadvice.org.uk/Global/CitizensAdvice/Energy/DisruptedDecade.pdf>

- **Security:** of consumers' data and privacy when using smart energy devices, which requires the development of sound, uniform standards across the industry;
- **Information:** which is relevant, understandable, true, accessible, free and complete; as the energy system becomes more complex, as smart tariffs, meters and other appliances fill the market, information will be key;
- **Fairness:** for example when deciding who should pay for the development of smart charging infrastructure for electric vehicles;
- **Cost-reflectivity:** for example in distributed generation support;
- **Vulnerability:** to ensure vulnerable consumers are not adversely affected by products or services which might not be suitable to them, but equally that they do not suffer indirectly because they are not able to access them.

Enabling storage

Question 1

Have we identified and correctly assessed the main policy and regulatory barriers to the development of storage?

Yes - Citizens Advice agrees with the assessment of issues facing storage with regard to regulatory barriers to development.

Question 2

Have we identified and correctly assessed the issues regarding network connections for storage?

Yes - Citizens Advice agrees with the assessment of issues facing storage with regard to network connections.

Question 3

Have we identified and correctly assessed the issues regarding storage and network charging?

Yes - Citizens Advice agrees with the assessment of issues facing storage with regard to network charging arrangements.

Question 4

Are there sufficient existing safeguards to enable the development of a competitive market for storage?

Are there any circumstances in which network companies should own storage? Please provide evidence to support your views.

Our preferred approach to networks' use of storage is for networks to contract with third party owners for storage assets to support network operation. At present, this is preferable to network ownership of storage assets. While we agree there is some risk of inefficiency given networks' monopoly position in contracting storage assets in their area, this is already inherently the case with conventional network activity that is still the main alternative. The prospect of a mostly-competitive market for network-supporting storage compared with the mostly-uncompetitive procurement of cable reinforcement should in most circumstances be helpful for consumers.

The possible deployment of storage to support network operation emphasises the importance of the total expenditure approach (totex) developed in the RIIO network price control settlements. As future price controls develop, the incentive structures should continue to push networks away from seeking to expand their

regulated asset bases in cases where efficient and low-cost operation of the network does not require them to own physical assets. Both historical economic incentives and network organisational culture have tended to lead to assets which can be built and owned by networks being preferred over non-physical or non-owned alternatives. A well-structured totex incentive would remove that tendency, putting non-network owned storage on an equal playing field with other investments network companies might make to improve the performance of their networks.

Question 5

Do you agree with our assessment of the regulatory approaches available to provide greater clarity for storage? Please provide evidence to support your views, including any alternative regulatory approaches that you believe we should consider, and your views on how the capacity of a storage installation should be assessed for planning purposes.

We would expect in time a move to a definition which accurately reflects the operation of storage. This most closely resembles option D on page 36 of the consultation. We recognise that finding parliamentary time for primary legislation may not occur quickly. However, we are wary that the current approach, which is in essence a workaround to accommodate a technology that was not anticipated when the regulations were being drawn up, could become a more difficult problem to resolve if left on the books while an expansion in the use of storage technologies occurs. We have not seen evidence that the time it would take to pass legislation would be fatal either to the storage sector or to the Government's wider goals of pursuing a smart and flexible electricity system.

Aggregators

Question 7

What are the impacts of the perceived barriers for aggregators and other market participants? Please provide your views on:

- **balancing services;**
- **extracting value from the balancing mechanism and wholesale market;**
- **other market barriers; and**
- **consumer protection.**

Do you have evidence of the benefits that could accrue to consumers from removing or reducing them?

Our principal expertise and interest in responding to this question concerns consumer protection. As with other elements in the supply market, aggregators currently work overwhelmingly with large non-domestic consumers and may not penetrate the micro, small or medium sized enterprise (SME) and domestic markets for a considerable period of time. It is nevertheless imperative that rules and policies are not made with only contemporary users in mind.

We do not think that consumer protection is a barrier to growth of aggregator services. It is arguable that the opposite should be the case - strong consumer protection will give SME and domestic customers confidence in engaging with aggregators in the future. The phrasing of question 7 is unfortunate as it suggests that consumer protection is perceived as a barrier by aggregators which is not supported by Ofgem's recent DSR provider and user survey.⁹

There is currently no additional consumer protection for customers of aggregators beyond the economy-wide provisions on data protection and contract law, and consumer protection regulations (including Consumer Protection from Unfair Trading Regulations). Another possible element for non-domestic consumers specifically are the Business Protection from Misleading Marketing Regulations (BPMMRs), which, among several bodies, Ofgem has the ability to employ. We would argue that aggregators are an advanced form of the Third Party Intermediaries (TPIs) covered by these regulations. Using the BPMMRs as an additional consumer protection tool in relation to aggregators needs to be strongly considered and clarified in consultation with Ofgem.

⁹ Industrial & Commercial demand-side response in GB: barriers and potential (2016) Ofgem https://www.ofgem.gov.uk/system/files/docs/2016/10/industrial_and_commercial_demand-side_response_in_gb_barriers_and_potential.pdf

In conclusion, we cannot see the current consumer protection regime inhibiting the behaviour of the type of aggregators we should be looking to encourage. Similarly, we cannot see any benefit to consumers of removing any existing protections. Indeed there needs to be extra clarity on whether aggregators are being considered as Third Party Intermediaries.

We currently do not hold evidence on consumer complaints or satisfaction levels with regard to aggregator services to underpin the points made above, since larger businesses do not use the Citizens Advice Consumer Service or the Extra Help Unit.

However, evidence from our own research into the smart meter rollout to SMEs suggests a high degree of apathy which means SMEs are forgoing the associated potential benefits, including the potential use of aggregators. Whilst 53% of respondents were aware that smart meters were available to their business, only 18% have tried to find out more information about them. More generally there is a 'gap' between aspiration to use smart technology to cut demand, and how to actually achieve this - of those with smart meters surveyed, only 28% were checking their data weekly.¹⁰ This could be seen as a market barrier for aggregators.

Question 9

What are your views on the pros and cons of the options outlined in Table 5? Please provide evidence for your answers.

With the right principles applied from the start in the non-domestic market, potential detriment should be minimised upon the introduction of aggregators in the domestic market. It seems unlikely that the latter will be substantially attractive to aggregators in the short-term, possibly not until the smart meter rollout is complete.

Citizens Advice will work with Ofgem to monitor consumer experience and outcomes, as we do with all emerging changes and potential issues in the energy market. We have recently increased our specific monitoring of TPI issues (in the non-domestic market) and will analyse and report on aggregator-based consumer issues as and when they come into the Consumer Service (though this is likely to not be for some time).

With regards to the various code options, there needs to be a consideration of how existing codes of conduct for TPIs will enable or influence aggregator-TPIs. It is likely that they will grow to encompass the latter and indeed they are already changing. For example, the previously E.ON-managed code¹¹ is shifting to a more

¹⁰ Publishing date to be confirmed

¹¹ TPI Code of Practice <http://www.tpicodeofpractice.co.uk/>

principles-based set-up in line with Ofgem's regulatory philosophy. It is possible that these codes will increase in number in the absence of a central, Ofgem-run one. Some will be more capable of embracing aggregators than others. We would thus urge BEIS to discuss the future plans with the relevant code managers themselves as a starting point. For example, the Energy Managers Association (EMA) code already refers to aggregators.

Whatever code(s) or equivalent that emerges will need to consider the following issues:

- **Transparency:** consumers will need to understand how DSR works, and their obligations and rights in the process. Costs and implication of future costs if settings are changed should be made clear to customers.
- **Data protection:** here code(s) could build on BEIS' smart metering data access and privacy framework which ensures that consumers must opt-in for the most detailed collection of their data and that they are well-informed about who accesses their data for what purpose. Equally, aggregators will need to be able to demonstrate how they ensure securely transmit and store customers' energy usage data.
- **Vulnerability:** DSR may not be appropriate for all consumers especially those with health concerns. Aggregators will need to adequately assess the appropriateness of an offering to consumers and also how they will deal with any changes to a customer's circumstances (given vulnerability levels do change).
- **Charging:** there is a case for guidelines being set out for how customers are charged generally and how to factor in potential impacts of network movements that could incur costs to all customers.
- **Standards:** as per the recent Bonfield Review¹², if an aggregator installs equipment or energy saving measures as part of their delivery to a provider of reduced demand then this must meet minimum standards and provide consumers with access to redress should things go wrong.

The third set of options - licensing in various forms - we currently consider disproportionate to the size that the aggregator market has and the types of customers they have (mainly large non-domestic). Continuing with our line of argument that aggregators are a form of TPIs, licensing them would also put them in an inconsistent position to other TPIs.

¹² Each Home Counts: An Independent Review of Consumer Advice, Protection, Standards and Enforcement for Energy Efficiency and Renewable Energy (2016) Dr Peter Bonfield, OBE, FREng https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/578749/Each_Home_Counts_December_2016_.pdf

Regardless of which approach is chosen, we caution to consider that any type of regulatory regime comes at a cost to the consumer, which should be proportionate to the benefit that would be achieved from such a regime.

Smart tariffs

Question 15

To what extent do you believe Government and Ofgem should play a role in promoting smart tariffs or enabling new business models in this area?

Please provide a rationale for your answer, and, if you feel Government and Ofgem should play a role, examples of the sort of interventions which might be helpful.

In undertaking the smart meter rollout, and beginning to expand the opportunities for half-hourly settlement, Government and Ofgem have already taken significant steps (at significant cost) to enable smart tariffs and dependant new business models.

As we have outlined before in [communications with Ofgem](#)¹³, we are concerned insufficient thought is being given to the need for enhanced or modernised consumer protection, as the market moves towards a greater role for smart tariffs. Activity to promote smart tariffs should be balanced with actions to reassure and protect consumers at a point of significant change and potentially rapidly increasing complexity in the marketplace.

Ensure consumers are given enough information about smart tariffs

Our research emphasises the need for clear information to enable consumers to understand smart tariffs, and to meaningfully compare these with other smart and non-smart tariffs. Work on information provision will need to be completed before non-traditional smart tariffs become widely available to consumers, in order to ensure that consumers are able to understand these tariffs, including what action they would need to take, and at what times, to shift their load and reduce their bills.

New tools, such as enhanced price comparison websites which let consumers model their bill based on different smart tariffs and possible behaviour adjustment, will also be needed to help consumers determine whether these emerging tariffs are suitable for them. In addition, changes to the Confidence

¹³ Response to Ofgem's open letter 'Half-hourly settlement (HHS): the way forward' (2016)
Citizens Advice
<https://www.citizensadvice.org.uk/Global/CitizensAdvice/Energy/Energy%20Consultation%20responses/Citizens%20Advice%20response%20to%20Ofgem%27s%20open%20letter%20on%20HH%20settlement.pdf>

Code may need to be considered, as it does not currently require price comparison sites to provide comparisons for non-traditional smart tariffs. As the operator of the domestic Confidence Code, Ofgem has an important role in monitoring whether price comparison sites and other information providers are giving consumers adequate information to help make informed decisions. To achieve this, suppliers will need to share detailed information on their time bands for different tariffs, both with consumers and price comparison sites.

Even if tariffs are easy to understand and compare, the emergence of a multitude of smart tariffs with different characteristics could introduce excessive complexity for consumers. The introduction of elective HHS should learn the lessons from the past, to avoid the problems of confusing marketing and tariff proliferation. An agreement between industry parties and Ofgem on the principles by which non-traditional tariffs will be designed in the elective HHS period would help consumers navigate these new products more easily.

The introduction of smart meters and non-traditional smart tariffs will fundamentally change the way that most consumers interact with the market. In addition to suppliers providing clear information to consumers, Government and industry should consider whether a broader communications strategy may be required. Citizens Advice is concerned that there is the potential for confusion and fear around mandatory smart tariffs.

Protect first-time adopters of smart tariffs

In principle, DSR should lower bills for consumers who change their behaviour (with any reward for load shifting proportional to the costs saved by their changed usage profile) without negative impacts on participating consumers who do not do so. However, this is unlikely to be the effect in practice. For example, in previous time of use trials¹⁴ a large minority of consumers failed to shift their load, and would in fact have seen bill increases if they had not been protected by the conditions of the trial. Similarly, our predecessor body Consumer Focus conducted research in 2012¹⁵ which found that 38% of consumers on traditional time of use (ToU) tariffs do not get any benefit from them.

¹⁴ Customer-Led Network Revolution Progress Report 7 (2014) Copyright Northern Powergrid (Northeast) Limited, Northern Powergrid (Yorkshire) Plc, British Gas Trading Limited, EA Technology Limited and the University of Durham
<http://www.networkrevolution.co.uk/wp-content/uploads/2014/07/CLNR-Progress-Report-7-New-links-.pdf>

¹⁵ From devotees to the disengaged: A summary of research into energy consumers' experiences of Time of Use tariffs and Consumer Focus's recommendations(2012) Consumer Focus
<http://webarchive.nationalarchives.gov.uk/20140728011208/http://www.consumerfutures.org.uk/files/2013/07/From-devotees-to-the-disengaged.pdf>

New consumer protections will be required to mitigate this risk, by limiting financial liability for consumers who switch to non-traditional smart tariffs and by ensuring that they are able to switch to other non-smart tariffs without penalties if they find their bills rise. The limits on liability could take a number of forms, including caps on bill increases or 'shadow billing', whereby consumers are billed on the lower of either a smart or non-smart tariff. Given the wider system benefits of DSR, providing these protections should not lead to an overall increase in costs to consumers. Such protections will be required to give consumers the confidence to participate in a nascent smart tariff market.

Protect consumers from mis-selling

It would also be desirable to have additional protections to prevent deliberate mis-selling. The complexity of the tariffs makes it even more likely that consumers will be taken in by misleading marketing and unscrupulous sellers. The protection could take the form of enhanced disclosure over the terms of the tariff or an extended cooling off period.

Consider impacts on those not adopting smart tariffs

While emerging tariffs may only be adopted by a minority of consumers, there is the potential for their introduction to have wider impacts, both positive and negative, for the non-participating majority of consumers who are left behind. System cost reductions and other efficiencies may be achieved in the medium to long term, but in the early transitional phase consumers who stand to benefit (in some cases without altering their behaviour at all) will switch to ToU tariffs to lower their bills. Until the efficiency savings from this change are realised, suppliers may seek to increase costs for their non-ToU consumers.

Furthermore, if DSR proves to be valuable to suppliers then they may prioritise their ToU consumers to the detriment of their non-ToU consumers, who could receive a relatively lower standard of customer service, or be offered less attractive deals. These considerations are important as it is clear that a large number of consumers will not receive smart meters until towards the end of the rollout, many will have a smart meter operating in dumb mode following a switch, and a minority will be unable, or unwilling, to have one installed.

Consider the needs of vulnerable consumers

Consumers in vulnerable circumstances will require particular consideration, to ensure that they are protected from unsuitable tariffs, but also to enable their participation in DSR where this is beneficial. The widespread introduction of ToU tariffs could also affect considerations of a consumer's vulnerability, such that a consumer's inability to load shift may become a circumstance which can place them in a vulnerable position.

Citizens Advice is currently conducting further research on the future role of smart tariffs, and how they fit with consumers' needs and expectations about the electricity market. We expect this work to be concluded in Spring 2017. We look forward to sharing our conclusions with Ofgem and BEIS.

Question 16

If deemed appropriate, when would it be most sensible for Government/Ofgem to take any further action to drive the market (i.e. what are the relevant trigger points for determining whether to take action)? Please provide a rationale for your answer.

We think that take-up of smart tariffs should be led by consumer appetite, and therefore do not see any need to further drive the market at this stage. If Government/Ofgem want to take steps to drive the market we think this should only occur after the majority of smart meters are rolled out.

Question 17

What relevant evidence is there from other countries that we should take into account when considering how to encourage the development of smart tariffs?

We have included this question in our ongoing research project on time of use tariffs. We will share any findings in this area when the project concludes.

Question 18

Do you recognise the reasons we have identified for why suppliers may not offer or why larger non-domestic consumers may not take up, smart tariffs? If so, please provide details, especially if you have experienced them. Have we missed any?

As part of our research on time of use tariffs we are conducting interviews with suppliers which will shed light on this question. We will share our findings when the project concludes.

Smart distribution tariffs

Question 19

Are distribution charges currently acting as a barrier to the development of a more flexible system? Please provide details, including experiences/case studies where relevant.

We recently published modelling to investigate the barriers that distribution charges might pose to the development of a more flexible system, focussing on cost reflectivity in micro distributed generation such as rooftop solar. We have attached our modelling, [The Tariff Transition](#)¹⁶, and our accompanying briefing, [Tackling Tariff Design](#)¹⁷.

In short, we believe BEIS and Ofgem must be as mindful of current distribution tariffs causing economic distortions as new technology is adopted, as it is of current tariff structures placing barriers on adoption. The guiding principle of tariff design should be cost reflectivity.

Currently, unit charges for distribution costs are based on net usage: the amount of energy they consume minus the energy they produce. However, unless these consumers are generating enough energy, and have the means to store that energy for usage when the sun is not shining, they will still rely on electricity from the distribution system to some extent. For this reason, some argue that rooftop solar panels do not necessarily reduce the costs of providing the distribution system to these consumers. These consumers are therefore potentially being under-charged. Because there is a fixed amount of revenue that must be recovered from consumers to deliver the distribution system, this cost is imposed on the remaining consumers — potentially including low-income consumers.

We propose options for reforming distribution tariffs, including smart-enabled options, that could enhance the cost reflectivity. These comprise non-smart reforms, such as higher standing charge or rising block tariffs, and smart reforms, such as time-of-use distribution tariffs or peak demand distribution tariffs. Each of these, in a world where there is high take-up of microgeneration, will help avoid a position where the distribution network becomes stranded,

¹⁶ The Tariff Transition: Considerations for Domestic Distribution Tariff Redesign in Great Britain (2016) Brattle for Citizens Advice
<https://www.citizensadvice.org.uk/Global/CitizensAdvice/Energy/Energy%20Consultation%20responses/The%20Tariff%20Transition%20-%20Volume%20I%20-%20Final%20Report.pdf>

¹⁷ Tackling Tariff Design: Making distribution network costs work for consumers (2016) Citizens Advice
<https://www.citizensadvice.org.uk/Global/CitizensAdvice/Energy/Energy%20Consultation%20responses/Tackling%20Tariff%20Design.pdf>

being paid for by an increasingly small group of consumers (as is perfectly possible under current tariff designs). In particular we think peak demand tariffs merit particular attention. Our modelling suggests they enhance cost-reflectivity and minimise the impact on low-income consumers, who are unlikely to be early adopters of micro distributed generation.

Under most possible reforms, the bill impact on the average consumer will be extremely limited. However, this masks massive variability, and there will be some consumers who face much more significant bill impacts.

Question 20

What are the incremental changes that could be made to distribution charges to overcome any barriers you have identified, and to better enable flexibility?

An incremental approach to changing distribution charges is inappropriate. It is important that processes are put in place to prepare for a gradual transition in the way we pay for distribution networks, in a way that plans for medium-term technological change.

Tariff reform should be a collaborative process. Ofgem will need to undertake a thorough open dialogue with stakeholders to ensure that design issues are considered from every angle. This should begin now: while the technological drivers may take time to come onstream, industry, the regulator and consumer groups could benefit from agreeing clear protocols and plans for tariff redesign.

The new tariff should be phased in gradually, to give consumers the time to adapt to the new pricing structure. Alongside this, a consumer education plan will be needed, to ensure that consumers are aware of changes in tariff design and can realise the benefits from certain tariff options (for example, by understanding how they could reduce their bill through shifting their energy usage to low peak periods under time of use tariffs).

Even if new tariff designs provides on average better outcomes for vulnerable and low-income consumers, there will still be consumers within these groups that will be worse off as a result of the reforms. A clear plan for supporting these consumers needs to be in place and consideration should be given to protecting these consumers if the impact on their bill is likely to be significant.

Question 22

Do you anticipate that underlying network cost drivers are likely to substantively change as the use of the distribution network changes? If so, in what way and how should DUoS charges change as a result?

In our view it is uncertain whether the current charging methodologies are fit-for-purpose in a changing technological landscape. As and if the energy system changes to a more distribution-led, demand-responsive order it may be appropriate to provide stronger price signals to accommodate this. Reform taken under the energy system's current technological profile could need to be undone quickly as the technological profile shifts. Along with the embedded benefit that emerges within the current charging design, Ofgem has identified other, albeit smaller, distortions that may also require attention. We would want to see any reforms to TNUoS or DUoS considered holistically. Crucial to this is a more strategic approach to reviewing industry codes and charging arrangements, rather than following the piecemeal and sometimes haphazard reforms that have often emerged from industry self-governance. We would like to see Ofgem work with BEIS to set strategic direction for industry codes, to ensure that changes to charging arrangements happen more nimbly and coherently.

Other Government policies

Question 27

Do you have any evidence to support measures that would best incentivise renewable generation, but fully account for the costs and benefits of distributed generation on a smart system?

Citizens Advice supports measures to improve the cost-reflectivity and ultimately the value for money of distributed generation support, including measures affecting larger scale, transmission-connected projects, offshore projects with offshore transmission connections. For these larger sized generation schemes we favour support schemes that not only lead to the cheapest technologies being chosen, but also which favour locating those technologies in places which impose the lowest additional costs on the system for connection and grid management.

Consumers' interests are usually best served by selecting the projects which are cheapest overall, not those which are cheaper in one assessed part of their

costs, but which can impose much higher costs in areas which are hidden from the contract allocation process or are not reflected in feed in tariff returns.¹⁸

In general our preference, for both transmission and distribution-connected generation is that the generator picks up their share of their associated costs. This would then be able to be factored into the bids placed in CfD allocation auctions, or determine whether a project is viable under feed in tariff rates that would then cover all costs of a renewable generator, and not just that of the generating equipment. As renewable technologies have matured this need no longer be a prohibitive barrier to clear. (While outside the scope of this question, we would emphasise these charges should not only be imposed for renewable generators, but for all generators).

Possibly the greatest challenge in assigning costs in this way is working out what the true costs imposed by an individual generator (renewable or not) on the network is. For a charging scheme structured this way to affect decisions about, for example, where to build a new power station or wind farm, the right number would have to be able to be forecast, and also relatively simple to interpret, so that developers can use the information provided to guide decisions. A system for assessing costs would thus need to strike a balance between, on the one hand, incorporating as much relevant information as possible, but on the other providing a simple and clear enough signal that it changes companies' choices about where and when to build.

Smart appliances

Question 28

Do you agree with the 4 principles for smart appliances set out above?

- Yes, and
- Others

We agree with the four principles outlined and the intention to ensure that an open, secure market for smart homes and smart appliances is enabled.

Consumers will only adopt and engage with these new appliances and services if they trust that they will be safe, secure and work for them. While evidence does exist in other markets of consumers adopting new services without fully

¹⁸ However special consideration must be given to community-driven generation support schemes. These schemes need to ensure the most appropriate generation is deployed for a particular community, not only in relation to costs but also with regards to maximising consumer engagement and inclusion.

understanding them in order to benefit from them, we also know that such situations tend to make consumers wary and less inclined to engage further.¹⁹

We would also note that the definition of ‘smart’ used in the consultation document (that is: able to support demand-side flexibility) is narrower than is conventionally used or as understood by those consumers familiar with the term. Regulations and guidance that refer to ‘smart’ appliances are likely to be interpreted as applying to any connected, or ‘internet of things’ (IoT) devices in a future smart home, those enabling DSR will be a significant subset of such devices.

This said we suggest the following additions:

- **‘Principle a’ should reference interchangeability** as well as interoperability. The call for open standards is welcome but with the increasingly diverse range of smart home and IoT standards being developed, each with varying degrees of ‘openness’ it will be crucial that consumers do not find themselves ‘locked into’ certain services, products or gateways for their home to work as they want it to. Consumers should not find themselves having to run numerous ‘hubs’ to allow appliances to work within their home network, nor should they be limited in their choices by the equipment that already exists in their home. Such scenarios significantly undermine consumers’ ability to switch providers and opportunities for new entrants to provide new tools and services. They have the potential to be exacerbated further where consumers change tenancies or move home and ‘inherit’ systems and appliances installed by previous occupants.
- **Additional principles should also be added regarding data transparency.** Citizens Advice and its predecessor bodies have undertaken a great deal of consumer research into both energy-specific²⁰ and wider data-driven services and equipment. Research has consistently demonstrated that despite wide variances in individual attitudes toward data, two key principles are consistently demanded by consumers, these can be roughly summarised as Transparency and Control. The proposed drafting of **‘Principle b’** explicitly addresses the latter but not the former. Consumers should have transparency of who is accessing their data, for

¹⁹ Fairness and flexibility: Making personal data work for everyone (2016) Citizens Advice <https://www.citizensadvice.org.uk/Global/CitizensAdvice/Consumer%20publications/Fairness%20and%20flexibility%20data%20expectations%20final%20report.pdf>

²⁰ Smart and clear: Customer attitudes to communicating rights and choices on energy data privacy and access (2014) Consumer Futures <http://webarchive.nationalarchives.gov.uk/20140728011208/http://www.consumerfutures.org.uk/reports/smart-and-clear-customer-attitudes-to-communicating-rights-and-choices-on-energy-data-privacy-and-access>

what purpose and in what detail. As noted in 'Principle b', consumers should also be able to make informed choices about this and retain the option to change their minds. In the event of significant problems with the security, privacy or general functionality of smart devices consumers may no longer feel the benefits of its smart functionality outweigh perceived risks or limitations and as such this control should also include the option for consumers to 'turn off' or 'revert to dumb' smart appliances or equipment and still make use of functionality not contingent on data flows or other 'smart' elements.

- **We would also welcome the addition of a principle related to data portability.** This relates again to avoiding consumers becoming 'locked into' specific products, services or 'ecosystems'. While processes and algorithms used to analyse consumer data may well be proprietary, raw usage data should remain the property of the consumer and consumers should be able to easily take it with them upon change of supplier. In addition to benefitting consumers and allowing them more choice and control this will also help align the introduction of smart home equipment with the same key principles underlying programmes like Midata. In the future, services and appliances may well make use of years of historical data to provide a better tailored service. If a consumer wishes to switch to a different provider they should not be prevented from taking that raw usage data to a new provider in an open and usable format to allow them to build their own tailored service. The current market includes some smart home products whose terms are that if you leave the service they will delete all of your usage history data immediately. If consumers feel that they will be 'back to square one' in terms of customisation, which will be at the heart of many smart services, then they will be disincentivised to switch even when better or cheaper offers become available.

Question 29

What evidence do you have in favour of or against any of the options set out to incentivise/ensure that these principles are followed? Please select below which options you would like to submit evidence for, specify if these relate to a particular sector(s), and use the text box/attachments to provide your evidence.

As identified in the consultation document a range of approaches to achieve these principles will be most effective, though we would note that there is a significant difference between requiring smart products to meet the principles outlined above and requiring all products to be smart. We would support the former but not the latter. Below we will comment on all three options A, B and C.

Option A: Smart appliance labelling

As described in the consultation document, would most closely resemble some manner of kite marking to reassure consumers that a product meets the required standards of security, privacy, transparency, control and interoperability/interchangeability laid out in the key principles. Our research²¹ into smart meter data and wider data-driven services has indicated an appetite among consumers for such labelling with regard to security and a similar approach to confirm interoperability and interchangeability would likely have value to consumers if it carried with it a guarantee that products would work as advertised and with existing equipment. Crucial for such an option to work will be consistency, as previously noted there already exist a range of communications standards with varying degrees of 'openness' and interoperability. There would need to be a single overarching standard and definition of these principles not multiple competing or industry-defined ones.

Option B: Regulate smart appliances

Some regulation will likely be necessary to ensure devices are secure. There have already been numerous widely publicised cases of 'smart' appliances being dangerously insecure from televisions²² to baby monitors²³ which are increasingly entering the mainstream media and public consciousness. The widespread take-up of smart appliances, especially those that can be remotely controlled, will hinge on consumer trust which in turn will require assurances that products will work as advertised and not place consumers' security or privacy at risk.

Similarly there already exist several companies whose business models rely on the creation of 'walled gardens' of consumer products which allow gatekeepers to provide services who can charge for or limit access to agreed partners. While such approaches are a frustration for consumers when it comes to app stores or media purchases, they have the potential to be far more detrimental if dominant in the consumer home, particularly where consumers are likely to inherit equipment and infrastructure from previous residents in a property. We have already seen some businesses of this nature begin to emerge, including systems

²¹ Smart and clear – Customer attitudes to communicating rights and choices on energy data privacy and access (2014) Consumer Futures
<http://webarchive.nationalarchives.gov.uk/20140728011208/http://www.consumerfutures.org.uk/reports/smart-and-clear-customer-attitudes-to-communicating-rights-and-choices-on-energy-data-privacy-and-access>

²² LG investigates Smart TV 'unauthorised spying' claim (2013) BBC
<http://www.bbc.co.uk/news/technology-25018225>

²³ Web baby-monitoring cameras open to hacking, study warns (2015) BBC
<http://www.bbc.co.uk/news/technology-34138480>

that collect detailed energy usage data from the home and then charge both the consumer and other third parties to access it. This is another reason that ensuring consumers retain ultimate control over their data will be vital.

Given the fast-moving nature of this policy area the proposed approach of applying key principles is likely the most advisable approach (see response to Q28).

Option C: Require appliances to be smart

Consumers should always have the choice of whether the products they buy are 'smart' or not. In the event that there are issues or concerns with smart products, be they teething troubles with new technology or longer term issues resulting from a failure to meet the principles outlined above consumers should not be forced to adopt such technology due to a lack of choice.

Requiring appliances to be smart would also remove the incentives on manufacturers to make them desirable to consumers and indeed to meet the principles outlined above. If the benefits outlined in this consultation document and elsewhere are being delivered consumers will increasingly adopt smart appliances and the market for them will grow. Mandating that all appliances be 'smart' would be counterproductive in achieving the aims outlined in this document.

A final risk of mandating that appliances be smart is the perception among consumers that this is a step being 'done to them' rather than one they are choosing to take up. Consumers are already increasingly ill-at-ease with many aspects of new data-driven services²⁴ and an effectively mandated step further into this World would likely be counterproductive and risk distrust and a potential backlash²⁵.

A final note is that mandating smart functionality even where they may not be market demand risks needlessly increasing the production, and therefore sales, costs of a range of vital appliances. Such a shift could have a particularly detrimental impact on consumers in vulnerable situations.

²⁴ Global Trends Survey 2014: Personalisation and Privacy (2014) Ipsos Mori
<http://www.ipsosglobaltrends.com/personalisation-vs-privacy.html>

²⁵ Fairness and flexibility: Making personal data work for everyone (2016) Citizens Advice
<https://blogs.citizensadvice.org.uk/wp-content/uploads/2016/07/Fairness-and-flexibility-data-expectations-final-report.pdf>

Question 31

Are there any other barriers or risks to the uptake of smart appliances in addition to those already identified?

- Yes

The consultation document correctly identifies many of the risks to the uptake of smart appliances. Most crucial will be:

- **Value:** if smart appliances are prohibitively expensive and the consumer benefits unclear or unappealing consumers, are unlikely to adopt them.
- **Trust:** if consumers have concerns about:
 - A lack of **control** over their own appliances
 - A lack of **transparency** as to what data about them is being collected, what is being used for and by whom
 - A lack of faith that their appliances are **secure** from external attack or the failure of the 'smart' components that operate it
 - Whether a product will work as advertised and **deliver** the functionality and benefits promised.
- **Ease of use:** consumers must be sure that their 'smart' products will work in ways as or more straight-forward and intuitive as their current appliances. Product makers should commit to an assumption of how their products will work rather than selling them 'as is' and seeking to limit their liability if they are not secure or fail to deliver the intended functionality.
- **Replacement rate:** Green Alliance research²⁶ provided some evidence that the rate at which consumers replace their appliances is not as high as government has assumed in its calculations.
- **Safety:** if appliances are to start operating independently of a consumer physically turning them on, safeguards will have to be put in place to ensure that fires or other accidents caused by appliances can still be detected promptly.

Many of these issues will be addressed if the principles outlined in our response to question 28 are adopted and implemented.

²⁶ Cutting Britain's energy bill making the most of product efficiency standards(2012) Green Alliance
<http://www.green-alliance.org.uk/resources/Cutting%20Britain%27s%20energy%20bill.pdf>

Question 32

Are there any other options that we should be considering with regards to mitigating potential risks, in particular with relation to vulnerable consumers?

- Yes

It is imperative that vulnerable consumers share in the benefits generated by smart appliances. It should also be noted that the potential risks to them are both significant and varied. These **risks include**:

- Missing out on the benefits of new equipment and tariffs due to affordability or access issues. This may particularly be the case for those in rented accommodation, especially where they are not responsible for appliances or home improvements, or those who are not able to use, do not regularly use, or do not have access to the internet.
- Increased profiling of individual consumers enabled by smart metering and other data-driven services results in more financially vulnerable consumers being excluded from the best tariffs or services due to a perceived higher risk or the perception that they will bear higher prices before switching.
- Circumstances of some consumers will mean they are less able to adjust their consumption and lifestyles in the required way.
- Consumers in vulnerable situations are also likely to be more vulnerable to the risks identified and discussed in previous questions, particularly around being 'locked into' certain service providers.
- There is a clear risk of the market becoming more complex for consumers. Complexity tends to disproportionately impact vulnerable consumers and risks them not engaging with the market or from being able to deal with any problems that may arise.

Questions of profiling may become particularly sensitive as there may be opportunities to help identify where consumers are finding themselves in vulnerable situations and allow industry to take action quickly to help them before problems worsen, however such approaches would have to be handled very delicately.

In order to **mitigate these potential risks** there will need to be certain safeguards including:

- A limit on increased costs as a result of failure to respond to a smart tariff in the right way, and the ability to switch back to non-smart tariffs without excessive exit fees or administrative burden.

- A guarantee that those who cannot afford to upgrade their appliances are not penalised.
- Clear processes by which longer-term contracts have clauses that allow for consumers situations changing unexpectedly - for example where consumers fall ill and can no longer afford a long-term service contract and wish to terminate it early
- Suppliers to closely monitor and review whether vulnerable consumers are benefitting from new arrangements.
- A consistent and robust industry-wide approach to sharing of smart data that ensures the consumer has control of who is using their data and for what.
- An ability for vulnerable consumers to stipulate the limits and parameters of an automatic DSR of their appliances to account for any specific needs eg a block on altering fridge consumption or a guarantee of heating at a certain time.
- Local engagement strategies that use local authorities, housing associations and community groups to explain how smart appliances can benefit vulnerable consumers. Such support is especially important since our research has shown that installers of smart meters provide very different levels of service²⁷ and do not always take the time to explain the new device's functionality²⁸.

Ultra Low Emission Vehicles

Question 33

How might Government and industry best engage electric vehicle users to promote smart charging for system benefit?

The emerging potential of smart charging technology looks likely to raise a number of difficult questions about fairness, and who should be required to pay the costs of the transition to a lower carbon transport system.

Without smart, ie managed, charging infrastructure, there is a risk that the (independent, honest) decisions made by electric vehicle (EV) purchasers could

²⁷ Vulnerable consumers and the smart meter rollout: Analysis of information request (2015)

Citizens Advice

[https://www.citizensadvice.org.uk/Global/CitizensAdvice/Energy/IRsmartmetersandvulnerableconsumers%20\(1\)%20\(1\).pdf](https://www.citizensadvice.org.uk/Global/CitizensAdvice/Energy/IRsmartmetersandvulnerableconsumers%20(1)%20(1).pdf)

²⁸ Early consumer experiences of smart meters (2016) Citizens Advice

<https://www.citizensadvice.org.uk/Global/CitizensAdvice/Energy/Energy%20Consultation%20responses/Early%20consumer%20experiences%20of%20smart%20meters%20-%20Research%20summary.pdf>

have severely harmful consequences for their neighbours. If a few households on a local network loop choose to charge their cars at the same time, the demands on the network could be severe enough to shut down the network, thus cutting off everybody on the loop. Clearly, this is a bad outcome, both for the electric vehicle owners and their neighbours.

The highest priority is that electric vehicle charging should not be able to impede other users' electricity provision. Assuming this condition can be met, any capabilities which enable EV owners to tailor their charging experience to fit their needs is clearly desirable, providing either a) the costs of equipping those options is low or b) that the costs are borne by electric vehicle owners/suppliers and not by the wider energy network consumer base.

It is reasonable for electricity network consumers to be asked to pay for smart EV charging equipment that prevents wider network failure or more costly network reinforcement. To the extent that additional features/capabilities increase participation from EV-owning households, they may also be justified as part of the smart EV charging programme.

However, it is not reasonable to expect all households to also bear the costs of equipment/services which provides value solely to EV owners and not to users of the wider network. Non-EV householders are already supporting EV ownership through tax-funded grants and publicly-funded charging networks. They should not be asked to incur another cost from which they gain no direct benefit.

We also observe that development of a communication strategy for managed EV charging has up to now played second fiddle to technical questions. However, as clarity emerges about the type of technical and policy solution being pursued, policymakers and the energy and vehicle sectors must also give serious thought as to how information about the chosen option can be accurately and succinctly provided to both EV customers and their neighbours. The objective must be to minimise misunderstandings, ensure that EV customers are aware of a limits they may face in their charging behaviour, as well as helping non-EV customers understand that they are not paying extra (and should be paying less than they would otherwise have done) once a managed EV charging solution is deployed.

Citizens Advice supports the deployment of a managed smart charging system (such as is being proposed by the consortium²⁹ behind the My Electric Avenue trial scheme). We are engaging with their proposals and consultation to develop a preferred option that can meet the needs of all electricity network users, while continuing to provide EV owners with the greatest degree of flexibility.

²⁹ Smart EV: Facilitating plug-in vehicle uptake (2016) EA Technology Limited
<https://www.eatechnology.com/products-and-services/create-smarter-grids/ev-projects/smart-ev>

Consumer engagement with DSR

Question 39

When does engaging/informing domestic and smaller non-domestic consumers about the transition to a smarter energy system become a top priority and why (i.e. in terms of trigger points)?

Any programme of engagement with consumers should be relevant to their own lives. This means it is likely to relate to the impacts of particular elements of the transition to a smarter system (for example, the smart meter rollout or settlement reform) rather than providing an overarching narrative about the changes as a whole. It also needs to be well-timed and targeted so that consumers are able to take action in response to information they are given. For example, consumers should be given most information on smart meters when their supplier is in a position to offer them one. Trigger points (moving home³⁰, a smart meter installation or the purchase of an electric vehicle) are therefore those at which consumers are impacted by changes in which they need to make active decisions to benefit or avoid detriment.

The energy system is technically complex, but consumers should not have to be exposed to complex information in order to participate in the transition to a flexible system. As a result it is important to craft simple messages which provide consumers with key information, while also making more detailed information available for those who are interested, and ensuring that advice is available for consumers who need extra help.

It is important that in messaging around the transition, industry does not simply skate over negative messages in favour of positive ones. Consumers need to understand how they can take advantage of new arrangements and will not be sympathetic if they are persuaded to take on goods and services that are not suitable for them. We have seen low levels of awareness in the smart meter programme around things like the limitation of SMETS1 meters.³¹ It is the responsibility of suppliers to ensure consumers make fully informed decisions. If they do not, it could back-fire on their perception of smart energy systems.

³⁰ Each Home Counts: An Independent Review of Consumer Advice, Protection, Standards and Enforcement for Energy Efficiency and Renewable Energy (2016) Dr Peter Bonfield, OBE, FREng https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/578749/Each_Home_Counts_December_2016_.pdf

³¹ Early consumer experiences of smart meters (2016) Citizens Advice <https://www.citizensadvice.org.uk/Global/CitizensAdvice/Energy/Energy%20Consultation%20responses/Early%20consumer%20experiences%20of%20smart%20meters%20-%20Research%20summary.pdf>

As the statutory body for informing consumers about and promoting the benefits of smart meters, SEGB has a big job to ensure it gets messages out to consumers in the manner outlined above. It is imperative that their engagement is flexible, allowing for any slippages in the programme timetable or changes to the provision or relative benefits of different types of equipment.

Generally, engagement will need to be sensitive to the individual needs of consumers, different types of consumers (domestic vs non-domestic), fuel needs (off gas vs dual fuel), technology type (solar, battery etc) will have different interactions with the energy system and will require different information at different points. Vulnerability will also need to be accounted for to ensure that all consumers are informed and able to benefit from relevant aspects of the transition.

Consumer protection and cyber security

Question 40

Please provide views on what interventions might be necessary to ensure consumer protection in the following areas:

Social impacts

As noted in the consultation document, consideration will have to be given to those consumers who may be unable to benefit from emerging products and services. This may be due to vulnerability or lifestyle factors that mean, for example, that they are unable to make use of load-shifting tariffs. Such consumers must not be penalised for this.

Given the overlap with our response to question 15 on smart tariffs, we will repeat parts of our statement here:

Protect first-time adopters of smart tariffs

In principle, DSR should lower bills for consumers who change their behaviour (with any reward for load shifting proportional to the costs saved by their changed usage profile) without negative impacts on participating consumers who do not do so. However, this is unlikely to be the effect in practice. For example, in previous time of use trials a large minority of consumers failed to shift their load, and would in fact have seen bill increases if they had not been protected by the conditions of the trial.³² Similarly, our predecessor body

³² Customer-Led Network Revolution Progress Report 7 (2014) Copyright Northern Powergrid (Northeast) Limited, Northern Powergrid (Yorkshire) Plc, British Gas Trading Limited, EA

Consumer Focus conducted research in 2012 which found that 38% of consumers on traditional time of use (ToU) tariffs do not get any benefit from them.³³

New consumer protections will be required to mitigate this risk, by limiting financial liability for consumers who switch to non-traditional smart tariffs and by ensuring that they are able to switch to other non-smart tariffs without penalties if they find their bills rise. The limits on liability could take a number of forms, including caps on bill increases or ‘shadow billing’, whereby consumers are billed on the lower of either a smart or non-smart tariff. Given the wider system benefits of DSR, providing these protections should not lead to an overall increase in costs to consumers. Such protections will be required to give consumers the confidence to participate in a nascent smart tariff market.

Consider impacts on those not adopting smart tariffs

While emerging tariffs may only be adopted by a minority of consumers, there is the potential for their introduction to have wider impacts, both positive and negative, for the non-participating majority of consumers who are left behind. System cost reductions and other efficiencies may be achieved in the medium to long term, but in the early transitional phase consumers who stand to benefit (in some cases without altering their behaviour at all) will switch to ToU tariffs to lower their bills. Until the efficiency savings from this change are realised, suppliers may seek to increase costs for their non-ToU consumers.

Furthermore, if DSR proves to be valuable to suppliers then they may prioritise their ToU consumers to the detriment of their non-ToU consumers, who could receive a relatively lower standard of customer service, or be offered less attractive deals. These considerations are important as it is clear that a large number of consumers will not receive smart meters until towards the end of the rollout, many will have a smart meter operating in dumb mode following a switch, and a minority will be unable, or unwilling, to have one installed.

Consider the needs of vulnerable consumers

Consumers in vulnerable circumstances will require particular consideration, to ensure that they are protected from unsuitable tariffs, but also to enable their participation in DSR where this is beneficial. The widespread introduction of ToU tariffs could also affect considerations of a consumer’s vulnerability, such that a

Technology Limited and the University of Durham
<http://www.networkrevolution.co.uk/wp-content/uploads/2014/07/CLNR-Progress-Report-7-New-links-.pdf>

³³ From devotees to the disengaged: A summary of research into energy consumers’ experiences of Time of Use tariffs and Consumer Focus’s recommendations(2012) Consumer Focus
<http://webarchive.nationalarchives.gov.uk/20140728011208/http://www.consumerfutures.org.uk/files/2013/07/From-devotees-to-the-disengaged.pdf>

consumer's inability to load shift may become a circumstance which can place them in a vulnerable position.

Furthermore, consideration should be given to how future charging will affect community energy generation that supports low-income consumers. It would be inappropriate for these consumers to be unfairly penalised when it has already proved difficult to extend these services to them.

Data and Privacy

In section 4.1 the consultation document states that a balance must be struck between a market in which innovation can flourish and one in which appropriate consumer protections are in place. This is a false dichotomy as the two should not be viewed as mutually exclusive. It has been consistently demonstrated that when consumers feel they have more choice and control over their data they generally share more data (for better or worse).³⁴ As such, consumer trust as a result of robust protections in the form of transparency and control will be the best enabler of useful innovation and service adoption, not a barrier.

A core principle for all smart principles should be that if the consumer benefits are clear then consumers will opt-in to sharing more detailed data in exchange for those benefits. Mandating any such sharing undermines the incentives for companies to provide consumer benefits in exchange for access.

While the consultation document references the Consumer Protection Act (CPA), equally important should be BEIS' smart metering privacy framework which builds upon the CPA and sets out a clear and well-founded system of consumer choice for the increased detail of consumer data generated through the smart meter rollout. This framework ensures that consumers must opt-in for the most detailed collection of their data and may choose to opt-out to less detailed data sharing. This approach not only grants consumers more control but also allows them leverage to ensure that they receive benefits in exchange for their data - effectively if a company wants access to a consumer's detailed data they must make a clear case to the consumer for why they want it and what benefits will be delivered in return. A similar model of regulation should be replicated in the smart home with regard to consumer choices to help ensure that it is ultimately consumers who have control over their data and are able to leverage it to their benefit.

³⁴ Brandimarte, L., A. Acquisti, G. Loewenstein (2010) Misplaced Confidences: Privacy and the Control Paradox, Workshop Paper <http://www.heinz.cmu.edu/~acquisti/papers/acquisti-SPPS.pdf>

Informed consumers

It will be imperative that clear, consistent and accurate information be provided to consumers about all new services and products that come with a smart, flexible energy system. This will be especially true in the increasingly complex realm of the smart home and IoT, as well as smart tariffs.

It will be vital to ensure that communications materials will not be used as a route by which responsibilities and liabilities are shifted from service providers to consumers. In particular lengthy terms and conditions should be avoided, as we know from [our research](#) that consumers rarely read these and seldom understand them when they do.³⁵ Indeed the lack of understanding is a part of how consumers justify not reading them. As has been noted elsewhere in this consultation response, service providers should commit to a clear understanding of how a product or service will work and deliver on that commitment rather than selling products or services ‘as they are’ and seeking to limit liability for any breaches in privacy or security.

The goal of many smart home services is to simplify and streamline consumer experience, but there is always a risk that, if not properly understood or opaque by design, such products and services may increase perceived complexity for consumers creating a world in which consumers need to be ‘informed’ about a growing range of increasingly esoteric products and services. This is why clarity and consistency should be at the heart of any information provided to consumers.

[Our research](#) on consumer needs from smart data communications materials concluded that there is a strong preference for layered information, for example a one-page summary of the key issues that signposts consumers to more detailed summaries of specific areas.³⁶ While consumers may not always engage with information provided initially, the knowledge that such information is available if needed at a future date often provides reassurance. The Information Commissioner’s Office (ICO) has incorporated many elements of these approaches and principles into its own guidelines on privacy notices.³⁷

³⁵ Against the clock: Why more time isn't the answer for consumers (2016) Citizens Advice <https://www.citizensadvice.org.uk/Global/CitizensAdvice/Consumer%20publications/Finalreport-Againsttheclock.pdf>

³⁶ Smart and clear: Customer attitudes to communicating rights and choices on energy data privacy and access (2014) Consumer Futures <http://webarchive.nationalarchives.gov.uk/20140728011208/http://www.consumerfutures.org.uk/reports/smart-and-clear-customer-attitudes-to-communicating-rights-and-choices-on-energy-data-privacy-and-access>

³⁷ Privacy notices, transparency and control (2016) ICO <https://ico.org.uk/for-organisations/guide-to-data-protection/privacy-notice-transparency-and-control/>

Blurred lines of responsibilities

A key issue that emerges for consumers as services become increasingly more integrated, data driven and less tangible is the need for a clear delineation of responsibility and accountability. Already within the energy market consumers can find themselves sent back and forth between energy suppliers, networks and the grid. As more parties enter this space, it will be crucial to ensure that consumers maintain a clear sense of who they should contact regarding different issues and who is responsible for what. Equally these lines should be drawn clearly for service providers to avoid areas where either nobody or multiple parties claim 'ownership' of an issue.

Extra support for vulnerable consumers

Local engagement and information strategies that use local authorities, housing associations and community groups to explain how to use smart appliances can benefit vulnerable consumers in particular. Such support is especially important since our research has shown that installers of smart meters provide very different levels of service³⁸ and do not always take the time to explain the new device's functionality³⁹.

Preventing abuses

Key to preventing abuses will be robust protections and processes and ensuring that consumers have a clear understanding of their rights and what these services will and won't do. Where breaches occur there must be a clear process of accountability to ensure that issues are resolved and those that breach the rules are quickly and effectively penalised. Measures should also be taken to ensure that smart service and product providers provide full disclosure if they do suffer a security breach, there have been too many cases of industry refusing to acknowledge where breaches exist rather than being open and making clear what steps are being made to remedy the problem.

As noted in the previous section, if not properly managed there is a significant risk of consumers, and potentially industry, losing sight of which parties are responsible and liable for which issues. Any grey areas that form in this new market will cause significant risk to consumer trust and safety, as such a clear

³⁸ Vulnerable consumers and the smart meter rollout: Analysis of information request (2015) Citizens Advice
[https://www.citizensadvice.org.uk/Global/CitizensAdvice/Energy/IRsmartmetersandvulnerableconsumers%20\(1\)%20\(1\).pdf](https://www.citizensadvice.org.uk/Global/CitizensAdvice/Energy/IRsmartmetersandvulnerableconsumers%20(1)%20(1).pdf)

³⁹ Early consumer experiences of smart meters (2016) Citizens Advice
<https://www.citizensadvice.org.uk/Global/CitizensAdvice/Energy/Energy%20Consultation%20responses/Early%20consumer%20experiences%20of%20smart%20meters%20-%20Research%20summary.pdf>

delineation of responsibility will need to be understood and agreed upon from the outset.

Question 41

Can you provide evidence demonstrating how smart technologies (domestic or industrial/commercial) could compromise the energy system and how likely this is?

In its recent “Evidence check: smart metering of gas and electricity”⁴⁰, the House of Commons Science and Technology Committee heard mixed views on the extent to which there are material security risks associated with the smart meter rollout, with some suggesting these risks were extremely limited and well managed and others suggesting they are substantive and yet to be fully thought through and tackled. At the latter end of the spectrum, the Royal Academy of Engineering told the Committee that “the threat of cyber attacks—either to gain information, ‘steal’ electricity or disrupt supply—is real and pressing. [...] Disruption to energy and gas supplies at a massive scale is possible, either from cyber attack or errors in software.” The Committee took some comfort from assurances it received from the Government Communications Headquarters that it was appropriately involved in ensuring smart meter security but nonetheless noted that there was a need to reassure the public on this point. This issue of public trust appears critical if consumers are to have the confidence to engage with both smart metering and smart household goods.

Notwithstanding the activity of security agencies, there have been a range of high profile examples of unsecured devices in the Internet of Things (IoT) being used in coordinated Distributed Denial of Service (DDOS) attacks.⁴¹ This has included smart household goods such as fridges. The issue of device default passwords remaining unchanged and being too easy to guess has been flagged as a problem, as has the inability for many devices to be updated or ‘patched’. These risks increase for appliances of items which will remain in place for many years or even decades. While to date coordinated IoT attacks have been most prominently manifest in DDOS actions, the ability of hackers to compromise the security of smart household devices does bring the risk that it could be used to either curtail power use, or overload power networks.

There is a current lack of security in many ‘smart’ devices, particularly where legacy companies ‘bolt-on’ smart functionality without considering or

⁴⁰ “Evidence Check: smart metering of gas and electricity”, House of Commons Science & Technology Committee, 24 September 2016. <http://tinyurl.com/hqxejm5>

⁴¹ “More than 750,000 phishing and spam emails launched from thingbots, including televisions, fridge”, Proofpoint, 16 November 2014. <http://tinyurl.com/o78zcxh> “Experts blame smart fridges, DVRs and other IoT devices: why your internet went down”, Tech Times, 24 October 2016. <http://tinyurl.com/z7kaxfetc>.

understanding the security implications. The early web provides a useful learning experience as it was initially insecure, leading to significant consumer wariness and distrust as well as a proliferation of scams and poor services with security only now being added in where possible at great expense and effort. Smart homes and services must have security (and privacy) baked in from their inception if consumers are going to trust, and therefore confidently make use of them in the future. Existing products that are not secure will need to be secured, both to prevent vulnerable points in a smart home and to prevent early negative stories of easily hacked or manipulated smart home devices⁴².

Roles and responsibilities

Question 45

With regard to the need for immediate action:

a) Do you agree with the proposed roles of DSOs and the need for increased coordination between DSOs, the SO and TOs in delivering efficient network planning and local/system-wide use of resources?

We agree that greater co-ordination between DNOs and TOs is needed to achieve the efficient use of resources across the system and enable a holistic approach to building the network.

More broadly, we think that the the specific role profile of a Distribution System Operator should be led by technological development, rather than specifying the role in too much detail in advance of knowing more precisely what the technological need will be.

That said, greater specificity about the types of activities that DSOs might be expected to undertake and the different potential DSO models would be welcome. In turn, this makes it difficult to assess the impact and feasibility of these suggestions. In particular, we believe further detail is required regarding:

- The cost involved in transitioning from DNOs to DSOs, and the comparison between this and a business-as-usual scenario;
- The mechanisms by which these costs will be recovered.

This should include a rationale for how DSO incentives will be captured in the RIIO framework.

Consideration should also be given to the extent to which DSO responsibilities should be assigned on a geographical basis if, for example, we expect

⁴² "Ring's smart doorbell can leave your house vulnerable to hacks" (2016) CNET
<https://www.cnet.com/uk/news/rings-smart-doorbell-can-leave-your-house-vulnerable-to-hacks/>

distributed generation to have a higher take up in some parts of the country than others.

Further thinking should also be devoted to the role of independent distribution network operators (IDNOs). While there are currently only 14 operating in the UK, their role is expected to increase in future. Their future role should be included in future analysis.

Innovation

Question 48

Do you think these are the right areas for innovation funding support? Please state reasons or, if possible, provide evidence to support your answer

The available budget of £50 million of funding over five years appears relatively limited, so it will be important that BEIS leverages in external funding where it can and that it concentrates its efforts on providing financial support where it will make a real difference in determining whether projects go forward or not.

We see particular value in BEIS funding residential trialling of automated DSR. While DSR has started to penetrate business consumer markets, it has made no impact in the household market to date. As a consequence, the potential implications for household consumers, both good and bad, of the development of such a market is particularly poorly understood. There are major challenges here around ensuring joined up consumer protection. For example, if an automated device is erroneously switched on or off, it may be difficult for consumers to understand whether the fault lies with their energy supplier, their telecoms provider or their appliance manufacturer - all of whom are separately regulated. There are also challenges around creating products that are simple enough to be consumer friendly but offer enough value to encourage or reward consumers for changing behaviour. It is unlikely that most consumers have a detailed understanding of the usage level and pattern of many household devices, particularly in a pre smart meter world, and understanding their assumptions and expectations on what demand they can move, and how much they would need to be rewarded to make such behavioural changes, would be useful. We suggest that such a study may also wish to consider who in a smart goods world customers' relationship would or should be with: suppliers, networks or equipment manufacturers?

Of the other areas identified, we see some value in BEIS bringing forward innovation funding on reducing storage costs and conducting vehicle to grid

demonstrations. The option value to consumers in both areas is potentially very significant in shaving peak demands, coping with intermittency and reducing network investment. Projects in both areas have already been conducted by distribution networks using LCNF / NIC funding, and are also the subject of research efforts elsewhere in the world focused on cost reduction, so the key here will be in ensuring that any BEIS funding provides additional learning/benefits above and beyond any such projects funding through the price control mechanisms. It may be worth considering whether some of those projects can, or should, be joint funded through a combination of NIC and BEIS funding rather than being wholly funded through the NIC.

While we agree that there is potentially significant consumer benefit to consumers from developing flexibility trading/optimisation platforms, we see this as a less obvious candidate for BEIS to fund. This is because the impediments to such developments do not appear to be an absence of capital investment but of gaps in the commercial proposition - developing products, building trading platforms, bringing buyers and sellers together, etc. We think BEIS and Ofgem can play a valuable role here, but it is likely to be through the form of identifying and resolving regulatory and legislative barriers to trading flexibility rather than seed funding the platforms themselves.

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