12 January 2017

Energy Saving Trust submission:
A Smart, Flexible Energy System

Energy Saving Trust is pleased to respond to the Business, Energy and Industrial Strategy (BEIS) and Ofgem consultation on smart, energy systems.

Energy Saving Trust is the leading, impartial sustainable energy organisation. We work on behalf of governments and businesses across the UK providing services in the area of data, assurance, grant and loan administration, consumer engagement and advice.

For BEIS the Energy Saving Trust delivers the telephone-based Energy Saving Advice Service in England and Wales. We also undertake other research and awareness-raising work for the department on a project-by-project basis. Prior to the coalition government, for over 15 years, the Energy Saving Trust ran national energy advice services as a grant-funded organisation.

In Scotland the Energy Saving Trust is a principal delivery partner of the Scottish Government for home energy efficiency. We run comprehensive local and national advice and support programmes.

Public engagement on energy is at the heart of our work. In total each year the Energy Saving Trust handles just under half a million energy efficiency advice calls on behalf of UK and Scottish governments. Energy Saving Trust has a unique relationship with the public around energy saving and renewable energy and our response reflects that.

Key points

- As the consultation document recognises “Moving to a smart energy system should bring benefits for all consumers”. In the domestic sector, the PRS and low income households face different challenges to other sectors: this must be reflected in the action Government and Ofgem takes.
- Labelling, combined with regulation of smart appliances, could be an effective way to protect consumers and increase confidence in the products on offer. Whilst we do not feel that introducing requirements for all appliances to be ‘smart’ is appropriate at this time labels and regulation should act as building blocks to make them feasible in the future.
- Although smart appliances can result in less energy use than alternatives this is not always the case. Network connectivity and standby statuses mean that energy consumption can be much higher than anticipated. Testing of networked products and market surveillance will be important to monitor this.
- Comparability between smart and “dumb” appliances needs to be simple and transparent. It is unclear whether current product testing and energy labels capture the differences between the various products effectively. This needs to be explored properly as energy labels are a vital consumer tool.
- “Smart” is a term that seems to be used quite loosely and can mean different things depending on the retailer or manufacturer. There is a role for regulation to ensure that definitions around the level of functionality that makes a product ‘smart’ are consistent. This could be incorporated into labels or into minimum functionality requirements for smart appliances.
- Communicating the benefits of smart options to households, beyond just smart meters, combined with a clear vision of how our energy system is going to evolve will be important to boost householder buy-in. Education and awareness raising around the smart energy system should be embedded in existing energy advice provision, for example Energy Performance Certificates and the Energy Saving Advice Service.

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.

As BEIS and Ofgem will be aware a 2012 literature review on domestic DSR commissioned by DECC[1] found "little evidence on the impact of DSR incentives on low-income and vulnerable consumers". In the BEIS Smart Energy Consumer Panel Research that accompanies this call for evidence it was reported that "Older people, those in social grade DE, and those living alone were less receptive to smart tariffs". These are both concerning findings and raise questions around the distributional impacts of the smart energy transition. As referred to in greater detail in response to question 40, consumer protection and making sure all parts of society are able to access smart technology is vital. We believe that government and Ofgem has an important role to play to ensure that smart tariffs are fully accessible and that less engaged consumers are aware of their potential benefits. This latter point is especially relevant to vulnerable consumers or households likely to be in fuel poverty. The Private Rented Sector (PRS) is another group that merits particular attention. Renters, especially in HMOs, may not be aware of the options available to them. This is already an issue for switching and risks being even more challenging when it comes to accessing smart tariffs.

Government/Ofgem should promote alternative tariff options in government communications, highlighting that alternative tariff options may help householders save money. There are already offers[2][3] on the market (beyond the well-established Economy 7 tariff) that deviate from the flat tariff structure that may offer benefits. It is doubtful that consumers that are already disengaged from the energy market will be aware of such offers. Government needs to actively pursue education and awareness raising programmes around the potential benefits (and risks) of various time of use tariffs. Particular attention should be paid to groups that are most at risk or least likely to engage.

The installation of smart meters and the options they open up presents an important opportunity to make householders aware of new tariff options. The actual deployment of smart meters by 2020 is not yet clear however and could be substantially less than anticipated or suffer from delays. Whilst this raises certain challenges it does mean that any potential post 2020 roll-out could be built around more sophisticated interventions, including raising awareness of alternative tariff structures and broader communication around the smart energy transition (see Q40). Beyond that BEIS frequently undertakes switching campaigns to encourage householders to shop around. Switching communications obviously present an opportunity to highlight not only the opportunities of switching to other suppliers but also other tariff types. Advice provision can also be enlarged to include messages around alternative tariff options. In Scotland, Home Energy Scotland partners with Citrus Energy which provides switching advice and guides householders through the switching process, if it is beneficial for them to switch. Routes such as these can be effective times to highlight new tariff options to householders.

---

[1] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48552/5756-demand-side-response-in-the-domestic-sector-a-lit.pdf
[2] https://www.britishgas.co.uk/products-and-services/gas-and-electricity/free-electricity-tariff.html
[3] http://www.greenenergyuk.com/Tide ;

25 Can you provide evidence to show how existing Government policies can help or hinder the transition to a smart energy future?

The Energy Saving Advice Service (ESAS) is a key programme that can be used to smooth the transition to a smart energy future as advice provision is one area that can be modified to keep pace with changing energy services. As mentioned in the response to the question above, switching campaigns and the smart meter rollout present opportunities to engage with the public on smart energy.

28 Do you agree with the 4 principles for smart appliances set out above (interoperability, data privacy, grid security, energy consumption)? • Yes • No (please explain)

Yes. Some of users' primary concerns are around reliability, privacy and security[4]. A study undertaken by UCL[5] finds that loss of control is acceptable to householders providing that the parameters are set appropriately and with an adequate override facility. This is an encouraging finding as it links to the point, referred to in the consultation document, that automation is an important part of delivering on the potential of domestic DSR and that there is appetite for these kind of tariffs, confirmed by the Smart Energy GB research referenced in the consultation.

Energy consumption is also an important principle when looking at smart appliances. Whilst smart technologies and tariff may deliver financial savings and help balance the supply and demand of electricity at a system level they won't necessarily provide the strongest signals to reduce energy usage. Ultimately to reduce energy demand in the residential sector investment in energy efficiency is needed. We are concerned by cuts to the Energy Company Obligation, £640m/year is not sufficient to tackle fuel poverty. We are also very concerned that there is nothing in place to encourage or support the able-to-pay market.

In response to question 30 we have highlighted additional areas of concern around energy consumption and smart appliances.

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. • Option A: Smart appliance labelling • Option B: Regulate smart appliances • Option C: Require appliances to be smart • Other/none of the above (please explain why)

At this stage we do not feel that introducing a minimum requirement for all appliances to be smart is appropriate. This action risks stifling innovation as new products, manufacturing processes and services are developed. We do not yet know of the type of functions that are going to be most attractive and valuable to consumers. Introducing requirements across all appliances now could lock industry into a particular product development route that at a later date may prove to be

[4] http://www.statewatch.org/news/2016/dec/ep-briefing-smart-appliances-electrical-system-12-16.pdf
[5] http://www.sciencedirect.com/science/article/pii/S2214629615300463

suboptimal. As such we feel that the introduction of a requirement for all appliances to be smart is premature but believe that it could be important to introduce in the future.

We believe that options a) and b) are the best options at present. A 'Smart Label' introduced now could be a useful foundation on which to build a minimum requirement at a later date, providing consistency to manufacturers and clarity to consumers. We would also urge BEIS to explore setting requirements regarding what can legally be called "smart" to ensure clarity from the get-go. Often regulation is forced to play catch-up in a rapidly changing market which can lead to confusion among the public and result in consumer detriment. There are already products on the market being sold as smart but that do not have network connectivity, for instance. This could confuse customers, especially in relation to smart meters. Some progress has already been made on this front by the Connected Devices Alliance (CDA), who have set out voluntary principles for Energy Efficient Connected Devices[6]. Whilst the Energy Saving Trust is not familiar with these principles and cannot endorse them per se they could be useful as BEIS and Ofgem explore this issue further.

Due to the complexity and evolving nature of this market we would urge BEIS to build up a stronger evidence base on smart appliances through field trials, exploring in particular:

- The extent to which current testing methods are suitable for smart appliances and whether they fully incorporate all of the issues around DSR, standby modes and others. These issues will vary according with the appliance and will need to be treated with caution.
- The linked point around the comparability of performance between smart and dumb appliances, as seen through energy labels. Do energy labels allow customers to fully understand the energy saving potential of smart appliances (e.g. through automated load deferment combined with a time-of-use tariff) compared to conventional appliances?
- The type of minimum requirements that are most suitable for smart appliances and the level of functionality that best ensures energy savings, ease of use, interoperability, data privacy and performance.

BEIS and Ofgem may well already be aware of the following however we would also flag up work undertaken by the European Commission[7], in particular work commissioned by DG Energy on smart appliances[8].

30 Do you have any evidence to support actions focused on any particular category of appliance? Please select below which category or categories of appliances you would like to submit evidence for, and use the text box/attachments to provide your evidence: • Wet appliances (dishwashers, washing machines, washer-dryers, tumble dryers) • Cold appliances (refrigeration units, freezers) • Heating, ventilation and air conditioning • Battery storage systems • Others (please specify)

A study looking at smart lighting[9] included some concerning findings, namely that "[…] the standby functions can drastically increase the lamp's total energy use, and depending on the daily hours of operation, the standby energy consumption can even be larger than the energy used for providing

[6] http://edna.iea-4e.org/news/support-for-cda-principles
[7] https://ec.europa.eu/digital-single-market/en/blog/new-standard-smart-appliances-smart-home
[8] http://www.eco-smartappliances.eu/Pages/welcome.aspx
[9] http://ssl.iea-4e.org/news/stand-by-of-smart-lamps

lighting" Similar concerns have been raised around smart TVs[10]. The energy use from network connectivity of smart appliances generally will be an important issue to monitor, as referred to elsewhere in this submission.

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

Smart appliances can end up using more energy than their 'dumb' counterparts as explained in a Clasp report[11] and in this briefing from the European Parliamentary Research Service[12]: "An overall increase in energy consumption is not unusual when smart appliances are used for demand response. For instance, a washing machine waiting for a signal to switch on can spend hours on stand-by, during which time it uses energy". Market surveillance will be important to address this however the extent of monitoring and testing is limited due to a lack of resources. Energy Saving Trust has been involved with CompliantTV[13] and Marketwatch[14] which uncovered interesting findings for a range of non-connected appliances. This suggests that market compliance will be an even more important issue when it comes to policing smart appliances.

Many smart home options involve the householder devolving some level of choice to a third party – decisions like when exactly to switch the washing machine on, or what time the boiler needs to fire up to achieve the desired comfort levels. Devolving choice can help to overcome the barriers of complexity and understanding, inertia and the lack of incentive to prioritise frequent actions to generate relatively small savings. However there are barriers to devolving these choices, mainly lack of trust in the third party to make the right choices – in other words, will the smart system achieve the savings that are claimed, and will it maintain comfort levels at the same time?

This lack of trust is inevitable in any new technology that is unfamiliar to most. The range of systems already on offer in some areas, such as smart heating controls, adds to the lack of understanding, and the fact that the only information on these systems is coming from those selling them adds to the lack of trust.

Trust can be built over time provided instances of ineffective systems and mis-selling are minimised. To maximise the chance of widespread uptake of appropriate smart home technology there will need to be:

- Firm regulation of system quality, transparency, and consistency of claims
- Universal interoperability, to allow householders to switch systems, strategies, suppliers and individual appliances irrespective of their previous purchases and contracts
- High quality and detailed impartial information and advice to help householders make sensible choices about smart appliances and systems

---

[10] https://iet.jrc.ec.europa.eu/energyefficiency/sites/energyefficiency/files/events/EEDAL15/S11_Consumer_Electr-1/eedal15_submission_19.pdf

[11] http://clasp.ngo/Resources/Resources/Headlines/2014/Appliances-Get-Smart

[12] http://www.statewatch.org/news/2016/dec/ep-briefing-smart-appliances-electrical-system-12-16.pdf

[13] http://www.compliantv.eu/eu/about-the-project/home

[14] http://www.market-watch.org.uk/

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

The development of smart systems opens up a new approach to tackling inefficient householder behaviour, but at the same time it introduces new barriers to householder acceptance. We believe that to build trust and protect consumers effectively Government should be looking at:

- Regulation of smart appliances and effective labelling (response to Q29)
- Alignment of all initiatives to support and influence domestic smart systems with the Quality Mark and associated aspects, as recommended in the Each Home Counts review.
- Inclusion of information on all aspects of smart homes in the proposed Information Hub.
- Inclusion of information relevant to smart opportunities within each home in the proposed Data Warehouse.
- Development of approved methodologies for assessing the impact of domestic smart technologies, comparing different smart options and comparing energy tariffs under different smart home options.

Of course, as long as there is consumer choice in the level of smart technology to adopt there will be significant numbers of households who choose to keep more direct control of everyday energy use decisions. Householders value being able to access their energy consumption data as seen through the Energy Saving Trust's Smart Meter Advice Project (SMAP), but on its own this isn't necessarily enough to bring about behaviour change. Householders also need to be able to interpret and understand the data. The SMAP evaluation report[15] indicates that being able to provide dynamic advice improves the effectiveness of installing smart meters and helps householders understand their energy usage. Advice and support needs to allow householders to benefit from the increasing amount of data available to encourage and enable them to change their behaviour in a more conventional way. As such we would recommend the development of advice tools that can be accessed by householders, either directly or by third parties on their behalf, to provide guidance on appropriate use of appliances, smart meter data, heating controls etc., based on the best available information for that property and household. The SMAP project can provide useful insight on this.

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)?

We believe that for the installation of smart meters to be successful and for in-house displays to be valued by homeowners, government needs to provide greater clarity about its vision of the energy system. Householders could easily dismiss the smart meter rollout as simply a programme to update metering rather than ushering in the future of a smart energy system. Communicating a vision of our energy system is by no means an easy task however but will be important to improve public buy-in and should assist with uptake of smart tariffs and appliances. Government needs to make clear that smart meters are the first step to moving to a more flexible, smarter energy system. We are

15 http://www.energysavingtrust.org.uk/search?search=smart+meter+advisory+project&sort_by=search_api_relevance_1

encouraged to read that "We believe our focus for engaging domestic and smaller non-domestic consumers should be on information provision, with a particular emphasis on how we might best empower and protect those vulnerable consumers who are most likely to have difficulty participating in a smarter energy system." Combined with specific measures to clarify definitions around smart technologies – as referred to in response to question 29, 31 and 32 – advice, education and awareness building around all that is smart energy will help consumers make well informed decisions.

40 Please provide views on what interventions might be necessary to ensure consumer protection in the following areas: • Social impacts • Data and privacy • Informed consumers • Preventing abuses • Other

We are pleased that social impacts feature explicitly in this call for evidence document. As repeated on numerous occasions in this submission we are concerned that vulnerable consumers will miss out on the smart energy transition and even risk being penalised because of it. We wholeheartedly agree with the call for evidence in that "Moving to a smart energy system should bring benefits for all consumers". BEIS needs to actively promote smart technologies that have the potential to save householders money to groups that would otherwise miss out.

The consumer detriment suffered by consumers on prepayment meters demonstrates the difficulties in protecting vulnerable customers. Smart appliances, smart tariffs and various automated options could help overcome problems like this once they are established and commonplace in the market but there will be a long period before reaching that point. Before that it will not only be imperative that adequate protection is in place but also that vulnerable consumers are encouraged and incentivised to engage with the market. A well planned transition and support programme will therefore be essential to prevent the groups that are not being well served by the market at the moment faring even worse. Vulnerability needs to feature much more prominently when reviewing the regulatory framework. It will not be possible to foresee how energy technologies and energy markets are going to evolve over time which makes it especially important that vulnerable customers are put at the forefront of energy regulation.

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

We do not think that smart technologies in the domestic sector risk compromising the energy system to any great degree. However we would highlight the points made above relating to network standby energy consumption, this could lead to unexpected increase in electricity demand.

47. Can you give specific examples of types of support that would be most effective in bringing forward innovation in these areas?

As referred to in the consultation document the Local Energy Challenge Fund supports innovative energy projects in Scotland. The Fund has been extremely successful in stimulating development of the low carbon local energy sector. By offering an open call in 2014 with £20m of public funding for innovative local energy projects, 118 applications were received from a range of sectors, showing the level of interest in the field. Six projects were offered capital support through round 1 of the Challenge Fund, and a further nice offered support in a second round in 2016. A development phase

supports projects to build up a capital application, identifying potential showstoppers, and progressing project concepts. Over £30 million of public funding has been offered through the Local Energy Challenge Fund in total since 2014. The Challenge Fund offers flexible support, working with projects to identify the most appropriate financial and in-kind assistance. A range of projects are supported, demonstrating a breadth of technologies and approaches. Grant and loan support can be offered, subject to due diligence to ensure value for public money. By supporting the projects through a central Fund, knowledge-sharing and collaboration is encouraged, and projects are able to find areas of overlap and efficiency.

This flexible approach, offering a variety of support mechanisms depending on the needs of the project, has been a successful one. A similar model could be effective in England and Wales, providing good value for money and giving community energy groups and the low carbon sector generally a chance to think up innovative energy solutions. We would urge Government to strongly consider setting up a similar scheme across England and Wales, potentially with a special focus or a proportion of the funding set aside for community energy groups. Due to the Energy Saving Trust's role as one of the key partners of Local Energy Scotland we would be happy to offer more detailed information on the specifics of the scheme.

CARES also supports smaller scale projects through the Infrastructure and Innovation Fund, which offers up to £70k grant support for local energy projects. To date, Infrastructure and Innovation support has been offered to 57 projects.