



Consultation on Smart Metering for Electricity and Gas

Response of the Centre for Sustainable Energy, August 2009

1. The Centre for Sustainable Energy (CSE) welcomes the opportunity to respond to the Government's consultation on Smart Metering for Gas and Electricity, published in May 2009. We have focused our brief comments on the domestic sector and on those issues where we believe we have particular expertise and understanding. These relate to: (a) consumer interaction with smart meters and preferences for in-house displays; (b) the potential value of creating a community-based, social process associated with smart meter roll-out, and; (c) the dynamics of the household energy market and the limitations of supplier-driven efforts to engage consumers in energy saving and the need to stimulate greater consumer engagement by distribution network operators.

2. CSE is a Bristol-based national charity which this year celebrates 30 years of developing, delivering and evaluating initiatives which enable households, organisations and policy-makers to develop effective responses to climate change and the misery of cold homes. The following areas of our work are of particular relevance to this consultation:
 - a. We lead the external evaluation team for Ofgem for the Energy Demand Research Project (EDRP), reviewing evidence from the four energy suppliers part-funded by the Government to trial smart meters, real-time display devices and other 'feedback' methods in more than 50,000 households over two years (2008 – 2010).
 - b. We have recently undertaken a short study for the Energy Saving Trust (EST) on consumer preferences for home energy display functionality (July 2009).
 - c. We helped develop and have, for the last 6 years, run on behalf of the EST the Community Action for Energy programme (now renamed 'Green Communities') which provides a growing network of now some 4,000 community activists across the UK with training, advice, and expert support in developing community-based sustainable energy initiatives.
 - d. We have worked closely, over many years, with a number of different energy suppliers on delivering energy saving programmes in the domestic sector, under different regulatory incentives: EESOP, EEC and now CERT.
 - e. We have provided expertise to Defra on the business models of energy suppliers, as background to work for Defra on a proposed post 2012 supplier obligation.
 - f. Our Chief Executive, Simon Roberts, sits on Ofgem's Consumer Challenge Group examining how best to use the current Distribution Price Control Review (DPCR 5) to stimulate the Distribution Network Operators (DNOs) to focus on customer service and the need to innovate in their networks to prepare for 'smart grids' (see <http://tinyurl.com/ccgroupbrief>).
 - g. We have provided energy advice to nearly 250,000 households in the Avon and Somerset area over the last 30 years, enabling them to take control of their energy use (and us to understand their levels of understanding, motivations, and capacity to act).

- h. We undertook for Defra and other government departments the 2007 study on mobilising individual behaviour change on climate change through community initiatives (see CSE, 2007 at <http://www.cse.org.uk/downloads/file/pub1084.pdf>).
3. We have focused in our consultation response on three issues
 - The **vital importance of establishing a very clear specification for the in-house energy consumption display**, based on consumer preferences revealed by our recent study for EST
 - The **importance of avoiding a 'wishful-thinking' energy supplier led roll-out model**, which we believe will deliver just a fraction of the benefits of a roll-out that looks and feels like a social change which serves a common, shared purpose
 - The **need to establish a roll-out model driven by energy networks, street-by-street with strong community engagement**, which has additional benefits not currently considered in the cost-benefit analysis in terms of changing the network operators into customer-facing companies ready to develop and deliver 'smart grids'.

Where possible we have provided our views with reference to the questions posed by the consultation paper

4. We also believe there are a number of issues which deserve considerable further exploration and we would be happy to work with DECC officials in this task. Specifically, these include:
 - a. The potential value of every household having identical or very similar display devices to create a sense of common purpose and shared experience
 - b. The best ways to use the smart meter roll-out process to stimulate engagement with energy consumption by households and to maximise its positive impact (including schools-based, community-based and PR-based activities)
 - c. The opportunities for – and potential value of – nurturing social capital (i.e. 'community spirit') through community-based approaches to supporting smart meter roll out
 - d. The particular needs of vulnerable households, including individuals with visual impairment.

Specifying smart meter displays for households

5. We welcome the Government's comprehensive high level specification for both gas and electricity smart meters (**Questions 7 and 9**).
6. We also welcome the Government's commitment to providing an in-house energy display to every household as part of the smart meter roll-out (**Question 12**). We consider the introduction of smart meters into UK households as a major opportunity to engage the population with their energy consumption and enable them to better understand the impact of behaviour, investments and purchase choices on their energy consumption (and thereby their carbon emissions). This will only happen if every home has installed an in-house display linked to their gas and electricity smart meters.
7. A key requirement now is to specify the in-house display in order to maximise its utility to householders and ensure it meets their needs.

8. Research we have recently undertaken for EST has explored consumer preferences for smart meter displays (Anderson and White, 2009 in press). The study explored with focus groups of various backgrounds their understanding of energy consumption in their homes, their preferences for displays of energy consumption, and then, at a follow up focus group session, each of their experiences of using one of the various real-time electricity consumption displays (RTDs) currently available on the market. The findings of the study in terms of consumer preferences for display design and functionality were clear and unambiguous, with all five focus groups converging on very similar design requirements.
9. A draft of our research report to EST is being made available to DECC officials by the EST. We will not therefore reproduce its findings in depth but rather draw out its implications for the roll-out of smart meters.
10. We believe these consumer preferences should be encapsulated within a binding core specification for in-house displays for domestic consumers (though we have little reason to believe that SME consumers would want less functionality or would have different display preferences). This specification assumes integration with a smart meter such that tariffs, time and other settings will be automatically updated by the utility through the smart meter:
 - a. The default display should include
 - A clear analogue indicator of current rate of consumption (such as a speed-dial)
 - Current rate of consumption as a rate of spend in £ per day (numeric)
 - Cumulative daily spend in £ (numeric)
 - Value of the current tariff
 - b. The display should offer the following options though interaction (by pressing a single button):
 - Spend in last seven days, day by day
 - Spend in last complete week
 - Spend in last complete month
 - Spend in last complete quarter

The historic periods should match the utility's billing periods in order that the display is consistent with household bills.
 - c. The display should offer the option (by pressing a single button) of switching units from money to power , i.e. from £ per day and £ to kilowatts and kilowatt-hours.
 - d. The display should be mains-powered but have an internal battery to enable mobility in the home.
 - e. The display should include a target-setting option.
11. The convergence of the designs of the five focus groups, following participants' experience of using real-time energy displays at home, is encouraging. For all the differences between and within the groups, a clear consensus emerged about what a real-time home energy display

should deliver. The core specification described above is drawn directly and without compromise from all five final designs.

12. It is notable that, of all the existing home energy displays used in the study, the display that was most popular and most closely matches the core specification – the GEO humm (see below) – is the only display to have been designed following substantive market research.



13. The fact that only one of the 7 RTDs on the market met the specification (and was designed based on market research) indicates the dangers of leaving it 'to the market' to develop displays for households for their smart meters. Moreover, the fact that energy suppliers have committed to providing householders with RTDs under CERT which also do not meet these consumer preferences indicates that we cannot rely on energy suppliers to represent consumer interests in the display market.
14. The research process also highlighted for us the potential value of treating the roll-out of smart meters as a social process, in which householders are brought together to have their display devices explained, share energy using and energy saving experiences, and be given advice on how to manage their energy use in future. We would recommend that DECC explore the options for ensuring this is a core component of the smart meter deployment plan (see also *Other Issues* below).
15. As a result of our experience in undertaking this research, we believe that there is potentially considerable value to be gained from take a further step beyond the core specification to insist on a single uniform display device for use in all homes. The consultation paper carries an inherent assumption that 'innovation' in display devices will have positive benefits for consumers (the innovation being driven, it is further assumed without evidence, by energy

suppliers). However, this has not been demonstrated either within the consultation documentation or in the market to date.

16. Indeed, we recommend that further study is undertaken to balance the potential benefits – and costs – of consumer choice in the display ‘market’ against the potential benefits – and costs – of all consumers having a very similar display device. We anticipate that there may be considerable disbenefits of leaving the display device ‘choice’ to the householder or, on their behalf, the energy supplier (who, thus far, has not sought to understand consumer preferences or needs). This ‘leave it to the market’ approach risks creating an ‘uncommon’ experience with largely meaningless differentiation in the look and feel of displays. This could lead to householder frustration with poorly developed products and undermine the potential to create a common experience for all households which can underpin community initiatives to maximise understanding and impact of the introduction of smart meters (see also paragraph 33a below).

The importance of street-by-street roll-out: why an energy supplier-led model is flawed

17. We agree with the proposal of establishing a central communications agency (**Question 1**). This seems to us to be a sensible approach to ensuring that all parties which need to be able to access metering information (eg energy supply and energy network companies) can gain access to it with relative ease and in accordance with common protocols and single access points.
18. We also recommend strongly the adoption of a street-by-street approach to the roll-out of smart meters (**Question 4**). Such an approach is:
- the most cost-effective way to install smart-meters which, due to logistical efficiencies, is also likely to have the lowest carbon footprint as a process
 - the easiest approach to identifying and solving geographically specific communications problems (which were not uncommon in the EDRP)
 - the least hassle for the householder (because of the opportunity to have both meters done in one visit for all households)
 - the most effective for creating social engagement between householders in relation to smart meter installations, thereby enhancing their likely impact on household energy use and reinforcing the sense of shared endeavour and common purpose which needs to be at the heart of efforts to tackle climate change (see CSE 2007, page 4).
19. As a result of this analysis of the value of street-by-street roll-out, we do not agree that energy suppliers should play any role in the roll-out of the installation of smart meters to households (and therefore do not support in full your Central Communications Model – **Question 1**).
20. Energy suppliers have, by and large, no monopoly in an area. Most streets in the UK will have customers of each of the ‘big six’ suppliers. As a result, energy suppliers are in no position to organise street-by-street meter roll-out. Furthermore, we are not confident that an approach based on energy suppliers co-operating to enable area-based approaches would be cost-effective, even if it could be made to work. We do not see examples of energy suppliers or other agencies effectively co-ordinating the actions of all six energy suppliers at a local level (**Question 4**). As outlined below, we prefer the Energy Networks deployment models developed in parallel with this consultation process.

21. In addition, we do not share Baringa Partners' optimism regarding the capacity of energy suppliers to initiate delivery more quickly than other parties (**Question 2**). The evidence of the performance of the four energy suppliers involved in the EDRP exposes a highly variable ability to organise, procure and deliver smart meter installations, even on a relatively modest scale. Meter installation is not a core competence of energy suppliers, neither is technology procurement or programme delivery logistics (which, in CERT insulation programmes, is almost entirely contracted out piece-meal to a variety of insulation contractors). We believe this anticipated 'early start' advantage of energy supplier involvement in the Central Communications model is grossly overstated in the analysis underpinning this consultation.
22. Baringa Partners' analysis has also ignored the cost to those householders with different gas and electricity suppliers of having to have two installation visits – one for electricity and one for gas – if energy suppliers are leading the roll-out. The hassle and potential loss of earnings should not be under-estimated in terms of the effect it will have on the willingness of householders to participate in this national programme.
23. Finally, we do not share Baringa Partners' view (outlined on page 33 of their main report) that energy suppliers would be the obvious or best source of 'customer education'. In our extensive experience (and from the focus group participants in the study described above for EST and in studies we have undertaken for Ofgem), householders generally do not trust their energy suppliers as sources of advice on energy saving. Baringa Partners presents its analysis as if this undoubtedly important educational role can only be achieved by energy suppliers (rather than a potentially wide range of other agencies, including DNOs). This is not an advantage which can be legitimately claimed for any model of roll-out simply because the model has energy suppliers involved.
24. Overall, we feel that both Baringa Partners and the Government have taken a naively optimistic view of the way in which energy suppliers interact with their customers and the benefits they therefore could readily bring to a roll-out process. In addition, there is a significant degree of wishful thinking inherent in (a) the conception of energy suppliers as effective delivery agents for technology installations at scale and (b) the view that energy suppliers could be easily and cost-effectively co-ordinated to deliver deployment on a street-by-street basis.
25. For reasons explained in paragraphs 5 to 16 above, we do not consider the potential role energy suppliers could play in offering customers 'choice' in smart meter display functionality provides any advantages in the roll-out stage. Instead we anticipate (though cannot demonstrate) that it would reduce the benefits of the introduction of smart meters by creating unhelpful differentiation between offerings and undermining a sense of common experience.
26. On this basis, we can see no obvious advantages to involving energy suppliers in the roll-out process (in terms of installing – or organising the installation of – meters in homes). We therefore believe that the Government's 'planned approach' in this consultation which puts energy suppliers at the centre of the roll-out is deeply flawed; it risks losing all of the considerable advantages inherent in a street-by-street approach.

Why DNOs should be at the heart of the smart meter roll-out process

27. It is our view that the smart meter roll-out delivery model should be driven by an assessment of the optimum practical process for delivery. As outlined above in paragraph 18, this points to street-by-street roll-out being at the heart of the model.
28. As appears to have been recognised during the consultation process (and in **Question 6**), the energy network operators can play a key role in this. They have a physical relationship with every property in their franchise areas and, in the case of DNOs, a significant need to re-engage with the consumers on the other side of the meters connected to their wires. They are therefore ideal delivery leaders for a street-by-street roll-out.
29. CSE's Chief Executive has been involved in considering the current state and future role of DNOs through his involvement in DPCR5 on Ofgem's Consumer Challenge Group. This has highlighted strongly the need for DNOs to re-engage with the customers served by their wires in order to create future opportunities to manage demand, communicate peak-opping opportunities and incorporate household micro-renewable electricity generation into local 'grids'. Such a 'smart grids' approach, widely regarded as a core component of a low carbon future, requires that DNOs are deeply involved in the smart meter system. Giving DNOs a central role in smart-meter deployment would, we believe, facilitate significantly the development of this approach by DNOs. We are not aware whether or not the advantages of this accelerated progress have been factored in to Baringa Partners' analysis. They would add to the case for DNO-led model.
30. Unlike energy suppliers, DNOs routinely procure technology and plan and undertake its installation and subsequent maintenance at scale. As a result, they are much more likely than energy suppliers to be able to achieve 'early start' advantage.
31. We therefore believe the **DNO-Deployment model** outlined by Baringa Partners in the background paper for the 3 July stakeholder workshop has much merit and should be adopted as the Government's preferred approach.
32. Furthermore, with DPCR5 at 'initial proposals' stage, we believe there is an immediate opportunity to embed this approach into the regulatory settlement for DNOs. The Government should engage urgently with Ofgem (and, we suggest, its Consumer Challenge Group) to further this cause.

Other issues needing consideration

33. As outlined in paragraph 4, we believe there are a number of issues which deserve considerable further exploration and we would be happy to work with DECC officials in this task. Specifically, these include:
 - a. The potential value of every household having identical or very similar display devices to create a sense of common purpose and shared experience. This could be explored through further market research, building on the work undertaken to date by CSE for EST.

- b. The best ways to use the smart meter roll-out process to stimulate engagement with energy consumption by households and to maximise its positive impact (including schools-based, community-based and PR-based activities).
- c. The opportunities for – and potential value of – nurturing social capital (i.e. ‘community spirit’) through community-based approaches to supporting smart meter roll out

We believe these could both be evaluated through a number of pilot interventions associated with initial roll-out areas, with a well-designed research programme testing the impact of each intervention against control areas.

- d. The particular needs of vulnerable households, including individuals with visual impairment. These could be explored by further targeted research (for example in partnership with the RNIB, Age Concern/Help the Aged, etc) along the lines already undertaken by CSE for EST.

References

CSE 2007, *Mobilising individual behavioural change through community initiatives: lessons for tackling climate change*. The Energy Review Study summary report to Government. CSE for Defra, Bristol 2007

Anderson W and V White (2009 in press) *Consumer preferences for home energy display functionality: report to the Energy Saving Trust*, CSE, Bristol, 2009 in press

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