Department for
Business, Energy
& Industrial Strategy

# THE SMART ENERGY SAVINGS INNOVATION COMPETITION

## Potential interventions and how they would have impact

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# 1. Overview

In-Home Displays (IHDs) and energy efficiency advice at installation are already delivering benefits for domestic consumers, including energy savings[1]. Other products and services can be used alongside smart meters to enable additional consumption reductions. However, where available current products and services are often relatively basic and have not been designed to give the sort of personalised and useful information that would be most helpful to consumers in enabling them to become more energy-efficient. More sophisticated products and services, or packages of products and services, could deliver larger savings.

The Smart ENergy Savings (SENS) competition has been launched by BEIS to trial products and services that can achieve energy savings for domestic customers. Through the competition BEIS will:

- identify innovative products and services using smart meter data that can deliver energy savings, in excess of those currently identified in the smart meter impact assessment, for either the GB population or specific groups within it;
- ensure that solutions are attractive and valued by those who would use them, and easily available (using either existing technologies and delivery channels or cost-effective new hardware);
- support the development of a market for energy products and services, securing investment from technology providers, energy suppliers, and third parties.

This document focuses on potential interventions and their impact and is intended to help applicants consider how their proposal could help meet the competition's objectives. By "intervention", BEIS means any action taken to influence energy consumption in homes, beyond the actions that are currently normal. An intervention could include, for example, new equipment, software, customer services or information – on a single occasion or on a more continuous basis. The intervention could be implemented by any or all of a range of parties, including energy suppliers, technology companies, public authorities or third sector organisations. Activities could include, for example, software development, algorithms or processes for creating energy analytics and feedback, or the development of smart technologies that integrate smart meter data to provide new functionality.

[1] https://www.gov.uk/government/publications/smart-metering-early-learning-project-and-small-scale-behaviour-trials

# 2. Potential interventions and their impact

## 2.1. Framework for developing and reviewing interventions

BEIS has carried out scoping work to inform this project using the *Means*, *Motive* and *Opportunity* framework to consider potential interventions.[2]

- The *Means* is the technology and household behaviour that will lead to reduced energy use. This includes the household having the necessary knowledge and skills.
- The *Motive* is the reason why households will want to act.
- The *Opportunity* is the resource (e.g. time, space or money) to act.

In other words, the intervention should assist consumers with knowing what to do, being motivated to do it, and having the resources to do it. This framework is intended to allow comparison of the roles of different elements of an intervention – it does not imply any particular theory of behaviour change or any conscious or unconscious, rational or irrational thought processes on the part of energy users. To this framework, we have added "*Trigger*": some prompt that will alert a consumer to an intervention or bring *Means*, *Motive* or *Opportunity* to mind. The framework is referred to in this document as "MMO-T".

Motive is a particularly complex issue but also an area with great potential for application. In the past, many interventions have relied on motives to save money or protect the environment. These are important motives but they have not fully engaged householders in reducing energy demand. There are other needs that people meet in using energy and these can also represent motives for changing behaviour (including the behaviour of accepting or purchasing new equipment or software). Research on heating the home and keeping warm has identified these five clusters of needs – the OCHRE scheme.[3]

| **O**ther people | **C**omfort | **H**ygiene | **R**esource | **E**ase |
|---|---|---|---|---|
| Caring for other members of household | Being comfortable | Wanting to feel clean | Energy costs | Doing what is easiest |
| The needs of visitors | Feeling in control | Keeping healthy | Avoiding wasting energy | Keeping to everyday routines |
| Wanting to be productive | Being able to rest and relax | Wanting to keep the home clean | Concern for environment | Doing what have traditionally done |
| How you and your home appear to other people | | Wanting to feel safe and secure | The value or cost of your home | Doing what you think most people do |
| Wanting to avoid arguments or disagreements within the home | | Keeping the home looking, feeling or smelling nice | | |

[2] Raw GJ, Varnham J & Schooling J (2010) Focus on behaviour change – reducing energy demand in homes. CLG, London. https://www.gov.uk/government/publications/reducing-energy-demand-in-homes

[3] Clery E, Finnegan J, Kunz S, Littleford C & Raw GJ (2014) Quantifying heat energy needs and behaviours. Report to the Energy Technologies Institute. Report SSH_SS1501_7. https://www.eti.co.uk/programmes/smart-systems-heat?_type=eti-document&query=&programmeName%5B0%5D=Smart+Systems+and+Heat#search-block

## 2.2. Possible interventions

### 2.2.1. Introduction

BEIS has developed a provisional list of possible interventions. These are not intended to be definitive but are available to help applicants determine whether their product is likely to be in scope of the competition and provide examples of how to demonstrate (in the application form) how their product could be effective. These possibilities start with individual interventions. To enhance likely impact, individual interventions should be combined into 'packages' that act more effectively across the MMO-T elements and/or engage a wider demographic group. Proposers should describe and justify their proposed package(s) in sufficient detail to allow a fair and thorough review by BEIS.

Section 2.2.2 discusses individual interventions.

Section 2.2.3 notes the standard actions that BEIS mandates energy suppliers to take during and following installation of smart meters, and where there are opportunities for new interventions to enhance existing benefits or add new ones.

Section 2.2.4 introduces possible packages of interventions.

BEIS understands that some types of intervention may not be readily applied where a household uses off-grid energy. Other than this, ideally the trialled interventions should ideally be applicable and beneficial to all GB households including those with:

- prepayment meters;
- limited access to (or ability to use) the internet or smartphones;
- household members who are vulnerable (for example due to physical or mental health issues) or are in a vulnerable situation.

Proposals should make clear and justify any exceptions to this, in terms of overall benefit and practicality. Proposals should also note where a design guided by the needs of a particular group would also work well for the majority of the GB population.

### 2.2.2. Individual interventions

The following possibilities have been identified, some of which are already at least partly in operation.

*Feedback*

- Real-time feedback on energy use.
- Historic comparison of the consumer's energy use.
- Social comparison: how the consumer's energy use compares with relevant other homes.
- Comparison with target consumption (set by the consumer or by a third party).
- Consumption disaggregated by end use.
- Alerts and detailed messages about current, recent or projected consumption.
- Integration into other technologies.

*Advice*

- How to get energy feedback (from an IHD, online or in some other way).
- How to interpret energy feedback.

- What action to take and why.
- Answering specific questions and addressing specific misconceptions.
- Demonstrating that certain technologies are effective for saving energy.

*Practical assistance*

- Give ‘how to’ demonstrations, e.g. how to set central heating controls.
- Carry out repairs or maintenance.
- Carry out small or large energy efficiency improvements.
- Help to prepare for energy efficiency improvements, e.g. providing a list of local installers or helping to clear out a loft.
- Offer products for sale, e.g. replacement boiler.

*Financial intervention*

- Offer financial assistance for energy efficiency improvements.
- Tariffs (e.g. time of use, critical peak pricing or rising block).
- Incentive for reducing energy use.

*Social intervention*

- Local events.
- Word of mouth.
- Education in schools.
- Competitions to save energy.
- Public commitments & making energy use public.
- Intra-household deals (e.g. for teenagers to share in the money saved by reducing energy demand).

*Type of technology*

- Automation, e.g. using smart appliances or heating controls.
- Remote control by the energy supplier or trusted third party.
- Remote control by the household.

Annex A analyses these options in more detail, using the MMO-T framework.

Applicants should bear in mind that some possible interventions, while theoretically useful, may be difficult to develop and/or implement (or difficult within the timetable for the proposed trials) and/or are likely to have limited impact.

It is also important to note that the rate at which smart meters will be installed is expected to be much reduced after completion of the trials and before the trial findings can be acted upon. For this reason, there would be little opportunity to deliver interventions during smart meter installations after the trials are complete. Installation may represent a convenient point at which to deliver an intervention during the trials but proposers would need to (a) provide a convincing argument that the same intervention would be as effective (or better) if delivered at another time and (b) show how sufficient pre-trial energy data would be obtained.

During the trials, suppliers might see the interventions as a means to encourage their customers to take a smart meter. For this reason, this guidance references

encouragement to take up a smart meter as a possible outcome of interventions but this possible benefit will not be taken into account for this competition. Again, any such benefit is not likely to be carried forward into any subsequent wider deployment of interventions.

Proposers are welcome to provide additional or alternative insights, to expand on the detail of what an intervention might look like or to propose alternative interventions.

### 2.2.3. Mandated actions

Three main actions are currently mandated to be provided to consumers with smart meters: energy advice at the time of installation, real-time feedback through in-home displays (IHDs), together with continuing the historic feedback on bills that customers should receive, regardless of their meter type**.**

These measures are already helping consumers reduce their energy use.[4] However, there is an opportunity to build on this positive base, with new products and services to deliver additional benefits for consumers – not to create alternatives to current policy but to explore the potential to deliver additional savings. Interventions will therefore be trialled with consumers who have already received the mandated requirements.

We summarise below how the currently mandated interventions can support energy savings using the *Means*, *Motive*, *Opportunity* and *Trigger* framework.

*Energy advice at the time of smart meter installation*

- *Means.* Advice helps build knowledge about what action to take. Delivering it at the same time as providing an In-Home-Display (IHD) to the consumer allows the advice to include guidance on using the IHD to support or identify potential actions.

- *Motive.* Advice can boost motivation to take action. The installer can explain reasons for acting to reduce energy consumption, for example focusing on financial motives.

- *Opportunity.* The installer might, for example, point consumers to the ECO scheme.

- *Trigger.* Having the installer in the home, suggesting what to do, can act as a trigger for taking action. A person in the home provides a different type of trigger to feedback from an IHD.

*Real-time feedback via IHD*

- *Means.* Helps build knowledge about what action to take, in two ways:
  1. IHDs help consumers identify what actions or appliances use a lot of energy.
  2. IHDs help consumers establish their baseline energy consumption, which can be used to identify whether something has been left on, e.g. when going out or going to bed.

- *Motive.* Shows consumers that energy use is high at a point in time or for a particular end use. This information could also cause one household member to prompt another.

- *Opportunity.* Provides an easy way to identify high power/energy use.

[4] https://www.gov.uk/government/publications/smart-metering-early-learning-project-and-small-scale-behaviour-trials

- *Trigger.* Catching sight of the IHD (and consumption information / traffic light presentation of energy use) could act as a trigger.

*Historic comparison of total energy use on bills*

- *Means.* Bills can suggest that some action is needed, but not specifically what that action would be (unless advice or suggestions are included). They can also provide confirmation that actions have had an effect.

- *Motive.* Helps boost motivation to take action. Historic comparisons show consumers whether their energy use is higher/lower than before, thus suggesting whether they (or another household member) should act to change the household's energy use.

- *Opportunity.* Accurate bills can save consumers time in identifying whether energy use has changed and provide consumption information in a different format to the IHD

- *Trigger.* Receiving historic comparisons could act as a trigger to take action.

### 2.2.4. Intervention packages

A range of factors need to be taken into account when developing effective packages of interventions to supplement or enhance what is currently mandated. Annex C provides further discussion of the possibilities. In addition, we have considered which behaviours to target, types of feedback to use and the need to tailor interventions to particular consumer groups. Interventions can also take advantage of moments of change.

Different types of behaviours will be suitable for different moments of change, e.g. large-scale energy improvements will be particularly suitable for home movers and improvers. Different interventions will be suitable for different people, e.g. vulnerable people are more likely to need one-to-one in-home advice. We considered these issues when developing the packages.

Based on the above principles, Annex D describes seven examples of possible packages, including likely feasibility, impact on energy use, and readiness for trialling. Figure 1 summarises the generic structure and content of the example packages. Each package includes the following elements.

- A way of promoting interventions to help consumers save energy.
- At least one intervention to boost motivation, build knowledge about what action to take, and act as a trigger to take action (e.g. alerts, advice, or word of mouth).
- At least one intervention to make it easier to take action by addressing resources that might limit taking action (e.g. technology, practical assistance, or financial assistance).

Our analysis focuses on reducing energy consumption because this is the main aim of the trials and hence a key criterion for evaluating proposals. Proposals should also identify any additional impacts that could either add to the value of the intervention or present a risk. Proposers will be expected to evidence the identified benefits and risks with prior testing or consumer research, evidence from other sectors or markets, or by consideration of relevant literature. In the case of benefits, proposals should also describe how these benefits will be realised in practice. In the case of risks, proposals should describe how they would be managed. Proposers may also wish to identify links with related BEIS policies, where those policies could benefit from the trials.

Examples of possible additional benefits to be evaluated include:

- shifts in the time of energy demand, relieving pressure on generation/supply at periods of high consumption;
- relief of fuel poverty;
- improved consumer wellbeing, including health, comfort, household harmony and sense of control over their energy use, bills and indoor environment;
- use of energy that results in lower carbon emissions;
- changes to the dwelling or energy systems that would, after the trial period, be expected to reduce energy demand;
- supplementary services using smart meter data or systems, such as home security or support for carers;
- consumer satisfaction with the intervention itself and its benefits;
- greater consumer understanding of energy use and energy markets.

Examples of risks include the following (these are in addition to broader project risks, which also need to be assessed as required in the main Invitation to Tender document):

- use of energy that results in higher $CO_2$ emissions;
- saving energy at the expense of consumer wellbeing;
- interventions failing to meet consumers' aims, thus creating a negative perspective on energy efficiency.

Such risks and benefits are likely to vary among groups of consumers. In particular, BEIS is interested in consumers who are fuel poor, financially constrained, or otherwise vulnerable. For such consumers, reducing energy consumption would not be desirable if it has a detrimental effect on the residents. BEIS will therefore consider proposals that demonstrate how they will deliver alternative improvements (e.g. on wellbeing) as a trade-off with energy savings.

**Figure 1.** Summary of structure and content of packages

Ways of promoting interventions to help consumers save energy.

**Reaching consumers at moments of change** (i.e. times when they are paying more attention than usual to their energy use or more open to change than usual).

- When a supplier visits a consumer for any reason.
- Cold snap.
- On track for a high bill.
- Home owner moving into new home/ making home improvements.
- Tenant moving into new home.
- Retirement.
- Receiving winter fuel payment.
- Newly unemployed.
- Before having a baby.

**Reaching consumers through social influence** (i.e. people they are more likely to pay attention to).

- Word of mouth from friend, family, etc.
- Organisations, e.g. employers (smart employer programme), schools, community groups.

Interventions to boost motivation (*Motive*), build knowledge about what action to take (*Means*), and act as a trigger to take action.

**Alert based on smart meter data** – via app, IHD, SMS, email, letter.

**Confirmatory feedback based on smart meter data** – via app, IHD, SMS, email, letter.

**Personalised advice based on smart meter data** – delivered via:

- Simple Energy Advice[5] (via web or telephone);
- a home visit from an advisor;
- events, e.g. at school, workplace, community group.

**Word of mouth** – advice and encouragement/to take action from friend, family, etc.

Interventions to make it easier to take action by addressing resources that might limit taking action (*Opportunity*) and to act as a trigger to take action.

**Technology** (remote control, smart controls).

**Practical assistance** (demonstrating or setting heating controls, carrying out or assisting with large home improvements).

**Financial assistance** (loans, etc.).

[5] Simple Energy Advice: https://www.simpleenergyadvice.org.uk/.

# Annexes

Annex A. Analysis of individual interventions

Annex B. Smart Meter Enabled Thermal Efficiency Rating

Annex C. Interventions to make effective packages

Annex D. Examples of intervention packages

# Annex A. Analysis of individual interventions

Table A1 summarises the interventions that BEIS has so far considered and their role in promoting behaviour change to save energy. Reference to SMETER (Smart Meter Enabled Thermal Efficiency Rating) is explained in Annex B.

The notes suggest whether the intervention would help to provide *Means*, *Motive*, *Opportunity* or *Trigger* – Yes, No or Possibly / Indirectly.

"Indirectly" could mean, for example, that advice on getting feedback on energy consumption does not directly tell people what to do to save energy. It just helps consumers to develop their own choice of *Means*.

*Motive* is mentioned where it arises directly from the intervention, for example where advice seeks to understand individual consumers' needs or motivations and provide relevant advice, or where consumption comparisons enhance socially based motives to change behaviour. Almost any intervention can operate on the basis of existing motives. Where an intervention involves financial feedback, for example, this is particularly likely to engage any existing motivation to save money, without necessarily creating or increasing that *Motive*. Where it is particularly relevant, this is noted as "building on any motivation consumers already have".

The table also comments on other relevant issues regarding the intervention, e.g.:

- would the intervention differ between behaviours and target audiences;
- what is ideal timing; what sub-interventions exist;
- how could it be delivered?

Timing of an intervention is generally less important for small changes like setting heating controls than for large changes that involve expense, mess or upheaval.

Table A2 seeks to categorise the interventions to summarise how smart meter data (including consumption and tariff information) might be used and how this would deliver energy savings.

## Table A1 Examples of individual interventions

| *Intervention* | *Means?* | *Motive?* | *Opportunity?* | *Trigger?* | *Comments* |
|---|---|---|---|---|---|
| ***Type of feedback*** | | | | | |
| Real-time feedback | **Yes.** (1) IHDs help consumers identify what in their home uses a lot of energy. But (a) consumers might not know what to do to reduce energy for this end use and (b) IHDs tends to emphasise high-power end-uses rather than those that use a lot of energy overall. (2) IHDs help consumers to identify whether something has been left on, e.g. when going out or going to bed. | **Yes** – building on any motivation consumers already have. Real-time feedback shows consumers that their energy use is high at a point in time and so gives them an indication of whether they should change their energy use. | **No** – except makes it easier to keep track of energy use compared with watching a meter or taking meter readings at short intervals. | **Yes.** Catching sight of the IHD could act as a trigger for taking action. | Behaviours – better for routine behaviours rather than purchases, and for electricity rather than gas use (so not as good for most heating-related behaviours if heating with gas).<br>Timing – consumers learn most of what there is to learn in a short time (but might possibly apply it over a longer period to identify items to be replaced). After that, real-time feedback can be used to check whether something has been left on. |
| Historic comparison | **No.** | **Yes** – building on any motivation consumers already have. Historic comparisons show consumers whether energy use is higher/lower than before, thus indicating whether they should change energy use. | **No** – except makes it easier to keep track of energy use compared with taking meter readings at intervals or comparing with the previous bill. | **Yes.** Receiving historic comparisons, e.g. on a bill, could act as a trigger to take action. | Behaviours – better for heating with gas than real-time feedback?<br>Sub-intervention – there are numerous different possible comparisons (e.g. different periods; different start points such as starting the comparison when starting a new energy-saving action). There are also different ways in which the periods can be selected (e.g. by the supplier vs by the consumer). |

| *Intervention* | *Means?* | *Motive?* | *Opportunity?* | *Trigger?* | *Comments* |
|---|---|---|---|---|---|
| Social comparison | **No** – unless the scheme allows the comparison group to communicate with each other. | **Yes** – social motivation; and building on any motivation that consumers already have. Showing whether energy use is higher or lower than similar consumers (however this is defined), gives consumers an indication of whether they should change energy use. This is motivating provided that consumers are motivated by the comparison with other people, including thinking that the comparison group is relevant to them. | **No** – except making it easier to compare energy use compared to asking other people about their bills. | **Yes.** Receiving social comparisons feedback, could act as a trigger. | Sub-intervention – there are numerous different possible comparison groups (e.g. neighbours, friends, colleagues; similar size homes; or similar age homes). There are also different ways in which they can be selected (e.g. by the supplier vs by the consumer). |
| Comparison with target | **No.** | **Yes** – building on any motive consumers have already. If consumers know whether their energy use is above/below target they can decide whether to change energy use. This is motivating provided that consumers are motivated to keep within target – there might be many motivations for this, depending on why the target was set. | **No.** | **Yes.** Receiving a comparison could act as a trigger, particularly if it is tied to an alert of some sort. | Sub-intervention – there are numerous different possible targets (e.g. individual vs communal) and different ways they can be set (e.g. by the supplier vs by the consumer). |

| *Intervention* | *Means?* | *Motive?* | *Opportunity?* | *Trigger?* | *Comments* |
|---|---|---|---|---|---|
| Disaggregated by end use | **Yes.** Feedback disaggregated by end use is intended to help consumers identify what in their home uses a lot of energy. They might or might not know what to do to reduce energy consumption for this end use. | **Yes** – building on any motive consumers already have. If consumers know that a particular use of energy is high at a point in time, or over a period, they can decide whether to change energy use. | **No** – except makes it easier to compare of energy use from different appliances. | **Yes.** | Behaviour – particularly useful for intermittent energy use that has a timing outside the household's control, such as fridges and central heating pumps.<br>It is not clear how accurate disaggregation can be if based only on smart meter data reads every 5 seconds. |
| Alerts and detailed messages | **Yes.** Alerts can make consumers aware of a need to take action at a particular time, e.g. when something has been left on, or that consumption has been unusual. Over time this could build knowledge about how to save energy in general.<br>Detailed messages linked to alerts should help to identify what to action to take. | **Yes** – building on any motive consumers already have. | **No** – except makes it easier to identify things left on, etc. without having to check an individual item or an IHD. | **Yes** – the main purpose of alerts is to act as a trigger for something consumers might not otherwise be aware needs action. | |
| ***Type of advice*** | | | | | |
| How to get feedback on energy use | **Indirectly** – so that consumers can interpret their feedback. | **Indirectly** – so that consumers can interpret their feedback. | **Indirectly** – so that consumers can interpret their feedback. | **Indirectly** – so that consumers can interpret their feedback. | |
| How to interpret feedback to save energy | **Indirectly** – so that consumers can apply their feedback. | **Indirectly** – so that consumers can apply their feedback. | **Indirectly** – so that consumers can apply their feedback. | **Indirectly** – so that consumers can apply their feedback. | |

| *Intervention* | *Means?* | *Motive?* | *Opportunity?* | *Trigger?* | *Comments* |
|---|---|---|---|---|---|
| What action to take and why | **Yes.** Advisors should suggest what action to take. | **Yes.** Explaining why to take action is the main benefit of this type of advice. Advisors typically focus on financial and environmental motivations. | **Possibly**. The advisor could point consumers to ECO and other sources of assistance. | **Yes.** Having an advisor suggesting what to do could act as a trigger for taking action. | Timing is key – especially if it relates to major installations, repairs, maintenance, or seasonal behaviours then timing.<br>Sub-interventions – could be provided face-to-face, online or by telephone. |
| Answering specific questions and addressing specific misconceptions | **Yes** – this is the main benefit of this type of advice. | **Yes** – if advice includes the reasons for taking action. | **Possibly** – as above. | **Yes** – as above. | As above. |
| Showing that certain technologies work | **Yes** – this is the main benefit of this type of advice. | **No** – except for consumers who are enthused by technology itself. | **Possibly** – as above. | **Yes.** | Behaviour – most useful for unusual or unfamiliar technologies (e.g. heat pumps). |
| ***Type of practical assistance***[6] | | | | | |
| Give 'how to' demonstrations, e.g. how to set central heating controls | **Yes.** | **No** – except for consumers who enjoy developing skills for their own sake. | **Yes.** This will build skills and possibly also show how quick and easy the task is. | **Possibly**. A demonstration might act as a trigger to consider an action that had not been considered before or had been forgotten about. | Behaviours – most suitable for easy DIY tasks.<br>Audience – should appeal to people who like to do things themselves rather than having things done for them.<br>Delivery – could be face-to-face, one-to-one (e.g. during a home visit) or one-to-many (e.g. at events), or by video. |

[6] 'Practical assistance' might be offered for free or charged for, depending on the target audience for the intervention. Hence there is some overlap with financial interventions.

| *Intervention* | *Means?* | *Motive?* | *Opportunity?* | *Trigger?* | *Comments* |
|---|---|---|---|---|---|
| Carry out repairs or maintenance | **Yes.** | **No.** But less motive is needed. | **Yes.** This will reduce the time needed to make or organise repairs or maintenance. Possibly reduces cost. | **Possibly.** The offer of help might act as a trigger to consider an action that had not been considered before or had been forgotten about. | Timing is important – this offer will have more impact when repairs or maintenance are actually needed. |
| Carry out small or large energy efficiency improvements. | **Yes.** | **No.** But less motive is needed. | **Yes.** This will reduce the time needed to make or organise repairs or maintenance. Possibly reduces cost. | **Possibly.** The offer of help might act as a trigger to consider an action that had not been considered before or had been forgotten about. | Timing is important, though less than for large energy efficiency improvements – this offer could have more impact when consumers are considering other home improvements, etc. |
| Help to prepare for energy efficiency improvements, e.g. provide a list of local installers, help to clear loft. | **Yes.** | **No.** But less motive is needed. | **Yes.** This will reduce the time needed to make or organise repairs or maintenance. Possibly reduces cost. | **Possibly.** The offer of help might act as a trigger to consider an action that had not been considered before or had been forgotten about. | Timing is important – this offer could have more impact when consumers are considering other home improvements, etc. |
| Offer products for sale, e.g. replacement boiler. | **Yes.** | **No.** But less motive is needed. | **Yes.** This will reduce the time needed to make or organise repairs or maintenance. Possibly reduces cost. | **Possibly.** The offer of products might act as a trigger to consider an action that had not been considered before or had been forgotten about. | Timing is important – this offer will have more impact when new products (e.g. a replacement boiler) are actually needed.<br>Sub-interventions – for sale at full price, with a discount, or with a loan; from a list of recommended products; offered by whom? |

| *Intervention* | *Means?* | *Motive?* | *Opportunity?* | *Trigger?* | *Comments* |
|---|---|---|---|---|---|
| ***Type of financial intervention*** | | | | | |
| Offer financial assistance for energy improvements | **Possibly.** The offer of financial assistance might draw attention to specific actions to be taken. | **No** – not on its own, without some existing motivation. | **Yes.** This will make improvements more affordable. | **Possibly.** The offer of financial assistance might act as a trigger to consider an action that had not been considered before due to its cost or had been forgotten about. | Audience – will appeal most to consumers who are motivated but constrained by cost.<br>Behaviours – mainly of use for costly improvements, but could also make a difference for low cost ones too. |
| Tariffs (e.g. TOU, CPP, rising block) | **No.** | **Yes** – financial motivation through reducing bills but with a risk of higher bills that might be off-putting. TOU and CPP are more relevant to shifting consumption. | **No.** In fact any need to change lifestyle to benefit from the tariff might be seen as a greater demand on time. | **Possibly** – change of tariff period could prompt consumers to think about what is switched on. | Audience – will appeal most to consumers who are keen to reduce bills.<br>Behaviours – more effective than incentives for changing habits, which needs ongoing reinforcement for some time.<br>Sub-interventions – tariffs vary in terms of potential benefit (likelihood and size of bill reduction), risk (likelihood and size of higher rather than lower bill), and effort (e.g. TOU with fixed/variable time change, one/several changes per day). |
| Incentive for reducing energy use | **No.** | **Possibly** – if saving on energy bills is not sufficient financial motivation on its own. But risks suppressing non-financial motives. | **Possibly** – if the incentive is spent on energy efficiency improvements. | **Possibly.** The offer of an incentive might act as a trigger to consider an action that had not been considered before as there seemed little reason to do it or it had been forgotten about. | Behaviours – likely to be one-off payment so suited to one-off behaviours (e.g. having a retrofit); less effective than tariffs for habit change which needs ongoing reinforcement for some time.<br>Less risk and effort than tariffs but less benefit. |

| *Intervention* | *Means?* | *Motive?* | *Opportunity?* | *Trigger?* | *Comments* |
|---|---|---|---|---|---|
| ***Type of social intervention*** | | | | | |
| Local events | **Yes.** This assumes that events are used as an opportunity to give advice. | **Yes.** (1) Social motivations, assuming that events include an opportunity to talk with other consumers. (2) The event might also mention other motivations (as in one-to-one advice). | **Possibly.** Events might include an opportunity to borrow or collect free energy-saving items. | **Yes.** Hearing about something at an event could act as a trigger for taking action. | Audience – less likely to reach socially isolated or busy people. |
| Word of mouth | **Yes.** Consumers might explain to others what to do and how to do it. But this advice might not always be correct. | **Yes.** Social motivations. Also consumers might share motives (e.g. how much money they have saved or how much more comfortable they feel as a result of taking action). | **Possibly.** Consumers might offer to help one another. | **Yes.** Having another consumer suggest taking action is an important trigger for many actions. | Audience – less likely to reach socially isolated.<br>Behaviours – are there any that tend not to be discussed, e.g. because they are taboo, too personal, or boring? |
| Education in schools | **Possibly.** This depends on children taking action themselves or relaying information and adults listening to them. | **Possibly** – depends on children engaging their parents about energy issues. | **No.** But schools could possibly send home energy-saving items (e.g. LED bulbs) or information or offers. | **Possibly.** Again it depends on children relaying information and adults listening to them. | Audience – schoolchildren and their parents/carers. |
| Competitions to save energy | **Possibly** – if it includes advice or a mechanism for finding out what other people are doing as well as finding out about their consumption. | **Yes** – social motivations. | **No.** | **Yes.** Being involved in a competition could act as a trigger for taking action. | Audience – likely to have niche appeal? |
| Public commitments & making energy use public | **Possibly** – if it includes advice or a mechanism for finding out what other people are doing as well as finding out about their consumption. | **Yes** – social motivations. | **No.** | **Yes.** Being asked to make a commitment could act as a trigger for taking action. | Audience – likely to have niche appeal? |

| *Intervention* | *Means?* | *Motive?* | *Opportunity?* | *Trigger?* | *Comments* |
|---|---|---|---|---|---|
| Intra-household deals | **No.** | **Yes** – provided that a suitable motivation can be found (e.g. increased pocket money for children if household consumption decreases). | **No.** | **Possibly** – household members might prompt each other. | Audience – multi-person households. |
| ***Type of technology*** | | | | | |
| Automation | **No** – knowledge about what action to take is not needed as there is no need for the consumer to take action (beyond installing the technology). | **No** – motivation to what action to take is not needed as there is no need for the consumer to take action (beyond installing the technology). | **Yes** – reduces the time and effort that consumers need to spend trying to, for example, adjust their heating because the controls do it for them. | **No** – a trigger is not needed as there is no need for the consumer to take action (beyond installing the technology). | Audience – likely to appeal to two audiences: technophiles and vulnerable consumers who struggle with heating controls.<br>Behaviours – mainly heating and hot water. |
| Remote control by the energy supplier or a trusted third party | **No** – knowledge about what action to take is not needed as there is no need for the consumer to take action (beyond allowing remote control). | **No** – motivation is not needed as there is no need for the consumer to take action (beyond allowing remote control). | **Yes** – reduces the time and effort that consumers need to spend (e.g. trying to work out when to carry out energy-using activities) because this is done for them. | **No** – a trigger is not needed as there is no need for the consumer to take action (beyond allowing remote control). | Behaviours – most suitable for energy end uses that are least time-sensitive (e.g. washing dishes/clothes). |
| Remote control by the household | **No.** | **No.** | **Yes** – reduces the effort needed to take action (e.g. a TV can be turned off rather than left on standby; heating timing can be managed *ad hoc*). | **Possibly** – having the control device to hand could prompt action. | Applicable to behaviours using technology that is out of physical reach, e.g. heating (from inside or outside the home), TV, IT. |

## Table A2 Examples of interventions, categorised by product or service

| *Product or service* | *Possible uses of smart meter data* | *How would this deliver energy savings?* |
|---|---|---|
| Mobile apps, web portals or improved IHDs providing enhanced feedback.<br>Example activities:<br>• app or web development, algorithm or code to analyse data;<br>• provision of a consumer access device (CAD). | Modelling to inform disaggregated feedback.<br>Provide alerts via integration with billing data (e.g. high bill warning) or weather data (e.g. change in temperature).<br>Target or goal-setting functionality.<br>Alerts about unusual consumption (e.g. high consumption at night). | Alerts provide a trigger for action and contribute to development of energy know-how (increasing households' ability to act).<br>Disaggregated feedback builds energy know-how.<br>All interventions provide or support a motive for action (for example financial implications). |
| Home energy reports (available online, printed or integrated into bills).<br>Example activities:<br>• report design and testing;<br>• algorithm or code to analyse data;<br>• provision of a CAD. | Modelling to inform disaggregated feedback.<br>Modelling to inform social or household comparisons.<br>Integration of smart meter data and EPC/SMETER (or other data about the property) to provide specific feedback. | These interventions build energy know-how and have potential to promote purchasing (energy efficiency improvements or appliances) in addition to routine behaviours.<br>Social comparisons provide additional motivation for action. |
| Smart thermostat product with integrated feedback from smart meter data.<br>Example activity:<br>• new functionality and/or hardware to communicate with smart meter system. | Integration of smart meter data and smart heating controls to include cost information when choosing heating settings. | Depending on the product's specific functionality, this could increase know-how (real time implications of changing settings) and the means to change consumption (through recommended settings or system learning behaviour). |
| Feedback provided by a mobile app or web portal, with follow-up advice and support service.<br>Example activities:<br>• app or web development;<br>• algorithm or code to analyse data;<br>• support services;<br>• referrals to energy advisors;<br>• 'how to' demonstrations;<br>• links to trusted installers;<br>• offer of energy efficiency products. | Integration with EPC/SMETER data to provide tailored feedback.<br>Use of basic customer survey and smart meter data to provide tailored feedback. | Products in this area would build on feedback interventions by also providing customers with the *Means* and *Opportunity* to reduce their energy consumption by making follow-up actions (identified by feedback) easier. This could include ways to encourage energy efficiency installations or upgrading to more efficient appliances. |

# Annex B. Smart Meter Enabled Thermal Efficiency Rating

## B1. Introduction

BEIS is currently examining the possibility of using smart meter data to provide more accurate current evaluation of a dwelling's thermal performance – "SMETER" (Smart Meter Enabled Thermal Efficiency Rating). A range of options exist for this and a BEIS project is looking at technical accuracy but is not at this stage committed to a specific approach. In contrast, the SENS competition could look at the ability of SMETER to support behavioural interventions. If applicants propose to include a SMETER in their package of interventions, they should outline the form it would take and state the date by which they are confident it will be ready to use.

The most basic, low cost SMETER could use only smart meter data and external temperature data from meteorological sources. More sophisticated and potentially more accurate versions would add internal temperature data and other possible enhancements such as data on boiler efficiency, floor & window areas, ceiling heights, occupancy, relative humidity, carbon dioxide (as an indicator of occupancy), hot water lost to drain, and dwelling and household survey data.

The usefulness of SMETER for influencing behaviour will depend to some extent on the details of the SMETER. However, there are three potentially useful connections.

1. SMETER could contribute to strategies for influencing consumer behaviour.
2. The same data might be useful for creating or testing a SMETER and for SENS.
3. Consumer behaviour can affect measurement of a dwelling's thermal performance, and changes in behaviour can cause an apparent change in thermal performance.

This annex discusses the first two of these two connections.

## B2. The role of SMETER in influencing consumer behaviour

### B2.1 Applying SMETER

SMETER itself could be applied as a form of feedback to consumers – not direct feedback on energy use but feedback on how their home is performing. Similarly, if consumers take action to improve thermal performance, SMETER could provide confirmatory feedback that some change has been achieved. It is worth exploring how this could be presented to consumers to have maximum impact on their inclination and ability to save energy.

More generally, the use of smart meter data rather than meter readings can – in principle – allow consumer engagement to proceed more rapidly (using disaggregation over shorter periods and more instantly) and with greater focus (if disaggregation by end use is feasible). The usefulness of SMETER will therefore depend in part on the period of data collection required (e.g. days, weeks or a full heating season) and the level of disaggregation by end use that can be achieved (particularly heating energy provided by the heating system vs other heat input).

Aside from direct feedback, we have identified two main behaviour change interventions that could make use of SMETER: providing energy advice (including predicted savings) and facilitating social comparisons. These two areas are discussed below.

### B2.2 Energy advice

In the first instance, SMETER would provide a means of supporting the targeting of interventions by identifying inefficient dwellings – particularly those that are less efficient than expected, based on their age and design. In these – or any – homes, SMETER could be used in the provision of advice to consumers, including the energy/cost/carbon savings that might result. The advice could be tailored to the household's actual energy usage pattern and thermal performance, for example to choose between additional insulation or more efficient boilers or heating controls. This would include highlighting where SMETER indicates under-performance relative to EPC-based expectations.

Advice might include suggesting, for example:

- checking for draughts or unnecessary window-opening;
- the need for repairs or maintenance of heating systems;
- fabric or equipment investments to improve energy efficiency (e.g. installing insulation or a new boiler).

This kind of advice is currently usually provided either generically (i.e. what actions are generally good to take) or specific to a dwelling on the basis of simplified building surveys or modelling (typically SAP), as in the case of EPCs and Green Deal Assessment Reports (GDARs). The limited success of this approach in influencing consumer behaviour may be attributable to two factors (in addition to any general household disinclination to take action):

- the extent to which consumers trust the EPC or GDAR (which might or might not be related to the actual accuracy of the contents);
- in the case of EPCs, the fact that they are usually commissioned by the landlord or previous owners, and therefore might seem less relevant to the current occupant.

SMETER has the potential to be more accurate than SAP ratings but this will depend on the details. Perhaps more importantly for consideration here, SMETER has the potential to be more convincing to consumers than SAP ratings; this has yet to be investigated, in general or in relation to the level of sophistication of the SMETER. The use of SMETER could also make clear that advice was based on the dwelling in its current condition, with its current occupants, thus providing an advantage over EPCs.

Where the data allow, SMETER might offer some additional possibilities for how feedback and advice might be framed.

- The external temperature below which the internal temperature would be expected to fall, if additional heating is not used: this could be used to motivate improvements to insulation or to heating efficiency.
- The external temperature above which no heating is needed: if this temperature is unusually high, it could be used to motivate improvements to insulation.
- The power that the household uses when heating is not needed (e.g. when the home is unoccupied): this could be used to motivate consumers to search for wasted power.

The main disadvantage of most SMETER models would be that they represent the thermal performance of the dwelling as a whole, without knowing the individual elements of the building envelope or building services. Therefore, a description similar to that included in EPCs (and possibly adding data on how the occupants currently use the home) would be a necessary supplement to enable some types of advice to be given.

### B2.3 Social comparison

Feedback on energy consumption can have a greater impact if it is accompanied by some kind of comparative data, showing how other homes are performing. This can be combined with agreed savings targets or some form of competition among households. The points made above, in relation to provision of advice, also apply here, in addition to the following points.

An established means of making social comparison of energy consumption is to use meter readings or IHDs, without any need for SMETER. The comparison dwellings can be those that are similar, based on design and/or location, perhaps taking into account the SAP-based energy efficiency rating.

Comparison can also be extended to include only similar households within similar dwellings but the comparison tends to be limited to relatively superficial descriptions (e.g. two adults, two children) or households that are expected to be similar because they are in similar homes. In reality, heating energy needs will depend on a range of other factors, such as when the home is occupied, the financial resources of the household, physiological variation resulting in different comfort temperatures, and incidental gains from non-heating equipment/appliances.

The effectiveness of social comparisons depends on whether the households perceive the comparisons to be fair, particularly if the household does not do well in the comparisons. As noted above, SMETER could be more convincing about the thermal performance of the dwelling than SAP and could appear more relevant to the current household; this could help in making comparisons seem fair but the other issues would remain.

To be as informative as possible, it might be necessary to use more than one SMETER – one representing the dwelling itself and the other representing the dwelling with the current household. This would separate the thermal performance of the dwelling with and without occupant influences (e.g. window-opening, room temperature choices) to show the occupants how much their behaviour is influencing consumption.

It is also worth considering that households might not see similar dwellings and households as the most motivating comparison. Comparison with people they know (friends, family, members of the same club, pub or church) could be more interesting and more motivating. Such a comparison group is unlikely to be similar to the way social comparisons are usually made but smart meter data and SMETER could be used to correct for differences in dwelling and household and therefore make fair comparisons. The point is not whether these comparisons are entirely accurate but rather how motivating they are.

## B3. Opportunity for shared data collection

The same data could be useful for creating SMETER and for other means of influencing behaviour. This is relevant because SMETER can be enhanced by collection of additional data. The justification for this additional data collection would be strengthened if the same data had other uses. Also, consumers might be more willing to provide (or allow access to) additional data to support their own ability to save energy than to support SMETER.

Feasibly the same means of data collection (e.g. via IHD, app or CAD) could also support both SENS and SMETER.

The additional measurements that might be needed for SMETER are a noted in Section B1. As the level of complexity increases to enable separation of the impacts of occupant

behaviour and the dwelling itself, there is an additional requirement for internal temperature and other data that might sometimes be used to improve accuracy.

The same data could be useful for other means of influencing behaviour. The most obvious example is that it is useful to know current room temperatures before advising on any changes to temperature or on the benefits of better insulation. More generally, seeing any deviation from the standard SAP assumptions (e.g. room temperatures, ventilation behaviour) would provide insight into the varying motives and needs that households have, hence what energy efficiency measures could be suggested. At the same time, it is important to anticipate any negative health/comfort/engagement impact of pressure on households to go against their needs.

Therefore collecting the extra data needed for SMETER is likely to have a double rationale, at least for households that sign up to a package of support to reduce their energy use. A wider range of data would also be useful for some interventions to influence consumer behaviour.

# Annex C. Opportunities to combine interventions to make more effective packages

## C1. Interventions that provide more actionable and motivating energy feedback

There are at least two ways that feedback could be enhanced to be more effective in assisting consumers to reduce energy consumption.

1. Links to advice that gives consumers a clearer idea of what energy uses they should focus on changing.

Alerts, and an accompanying checklist, could direct consumers to what has been using energy prior to the alert. Targeted personalised advice or interactive advice at group level would more directly assist consumers in identifying causes of high energy use. More generally, directing consumers to an existing energy advice service such as the Simple Energy Advice[7] website and telephone service could assist them in targeting causes of high energy use.

Personalised advice based on smart meter data can improve calculation of savings from taking action to reduce heating energy demand. Depending on the state of development of SMETER (see Annex B), it could be incorporated into advice and prediction of savings.

2. Advice could be more motivating.

Several of the interventions we have noted do this, e.g. by showing consumers how their use compares to other people's or to targets they have set themselves; and by giving confirmatory feedback so that consumers can see what impact a change to their behaviour or their home has had on their energy use. Where smart meter data is used to personalise advice, it can identify and apply the motives that are most relevant to the individual consumer or household.

## C2. Interventions that provide better advice based on smart meter data

After consumers have had their smart meter for some time, follow-up advice can be based on smart meter data to help give more tailored personalised advice than can be given at smart meter installation. While the temptation is to rely on Simple Energy Advice because it already exists (and therefore has low marginal cost), it is risky to rely on any single delivery mechanism for follow-up advice. Table C1 summarises alternative ways of providing advice. This refers mainly to the route for advice, rather than its form, which could be verbally or in writing (including home energy reports).

It is possible to envisage enhancements to the Simple Energy Advice service to provide personalised advice using smart meter data. However, it will need to be clear that either (a) the enhancements are already planned (on a timetable that will work for the trials) or (b) the enhancements can be funded within the trial budget and timescale, and user needs are researched and evidenced so that Simple Energy Advice managers can agree to them.

[7] Simple Energy Advice: https://www.simpleenergyadvice.org.uk/

**Table C1** Three ways of delivering follow-up advice

| | *Pros* | *Cons* | *Issues needing thought* |
|---|---|---|---|
| Simple Energy Advice | • Already exists.<br>• Low marginal cost so can be offered to many people.<br>• Web-based so there is no likely limit to the number of consumers who can use this part of the service.<br>• Telephone advice also available.<br>• Developers currently open to suggestions for how to extend or improve it. | • Does not use smart meter data to personalise advice.<br>• Telephone advice service might need extra resource to manage large numbers of referrals. | |
| *One-to-one in-home advice* | • Likely to be effective.<br>• Advisor can better understand the dwelling and the relevant technology that is present. This is particularly helpful when advising on large-scale energy improvements.<br>• Likely to be welcomed by some consumers, e.g. because they are considering large-scale energy improvements or they have difficulty with understanding energy. | • Expensive so may need to be used selectively.<br>• Funding is not currently widely available.<br>• Will not appeal to some consumers, e.g. if they are wary about having strangers in their home or find it hard to fix a time for an appointment. | • Who would fund it (e.g. suppliers, DIY companies)?<br>• Who would deliver it (e.g. charities, local authorities, EST)?<br>• Who would it be offered to (e.g. vulnerable consumers, consumers keen on making energy improvements to their home)?<br>• The answers to the above questions might differ between packages. |
| *Advice at events, including brief one-to-one advice sessions* | • Less expensive than one-to-one in-home advice.<br>• Social support and influence might help consumers to implement the advice, if events are run in a setting where people have ongoing contact, e.g. workplaces, schools. | • More expensive than SEA.<br>• Likely to be less effective than one-to-one in-home advice, particularly when advising on large-scale energy improvements.<br>• Access to smart meter data might be difficult. | • Could smart meter data be accessed? |

### C3. Interventions that provide resources to take action

At the moment the interventions offered to consumers with smart meters do little to provide the resources (e.g. money, time, space, and mental/physical effort) for consumers to take action. We note these three types of interventions that address this gap.

- Technology (e.g. remote control and smart controls that reduce the time and effort involved in operating lights, appliances and heating at appropriate times).
- Practical assistance (e.g. carry out maintenance and repairs, carry out or assist with large energy efficiency improvements; and give demonstrations to build skills, thus saving consumers time and money).
- Financial assistance for energy efficiency improvements (e.g. free improvements like ECO, subsidies, loans, grants and collectively negotiated deals).

Most of these interventions do not use smart meter data. However, they are essential for enabling more consumers to act, once interventions that do use smart meter data have helped them identify what to do and motivated them to take action.

Some of these interventions already exist so to use them in packages would just require information about them to be maintained centrally and presented directly to consumers in an easily usable form. However, some would need to be stimulated or funded as part of the trial and so the cost of this would be a key consideration.

### C4. Interventions that leverage social influence and social support

Interventions could use social influence and social support include social comparisons; events in places where there is ongoing social support (e.g. workplaces, schools, community groups); and word of mouth from family, friends, etc.

We see these interventions serving two main roles.

- They can make consumers aware of other interventions that are available. For instance, consumers who have found an intervention to be useful can be a route to promoting it to other people.
- They can act as a source of support for taking action to reduce energy use, helping overcome resistance (including from other members of the household), or build on existing motivation.

### C5. Different interventions to address different types of behaviour

An alternative way of selecting interventions is to consider how different types of behaviour might be influenced by different interventions. Specifically, different types of intervention might be appropriate to boost motivation, build knowledge about what to do, and make action easier for different types of behaviour, as the examples in Table C2 show.

**Table C2** Examples of Interventions for routine behaviour and large-scale energy improvements

| | *Routine behaviours, e.g. turning heating off when going to bed* | *Large-scale energy improvements* |
|---|---|---|
| Interventions to build knowledge about what to do (*Means*) | A lot of common everyday behaviours to save energy are already familiar to consumers. However, personalised advice, so that consumers see them as personally relevant, might be helpful. | One-to-one in-home advice is likely to be particularly useful for energy improvements for three reasons.<br>(i) The advisor can actually see the home and get a feel for suitable improvements.<br>(ii) The behaviour is more likely to result in substantial and enduring savings, thus justifying the cost of one-to-one in-home advice.<br>(iii) Detailed advice (e.g. exactly what type of insulation) might be needed to help a consumer take action, more so than for many everyday behaviours. |
| Interventions to boost motivation (*Motive*) | Social interventions (e.g. word of mouth) are likely to be very effective here as social influence is sometimes an important barrier (e.g. others in the family wanting the heating on higher). | Calculating potential savings using SMETER is likely to play a more important role for investment behaviour than everyday behaviour, partly because the savings are potentially larger and partly because cost might be more front of mind as a consequence of the costs associated with making the improvements. |
| Interventions to offer resources for action (*Opportunity*) | Reminders to do the behaviour so there is no need to try to remember.<br>Technology, e.g. remote control to save time and effort. | Financial and other practical assistance to reduce the money and effort required. |

# Annex D. Examples of intervention packages

This annex provides seven examples of possible packages of interventions. These are examples and not an exclusive list of options. They are intended to:

(a) make clear what we mean by “package”;

(b) stimulate further thought about alternative packages;

(c) show the kind of analysis that would be needed to justify trialling a package.

For each package, we describe how it would be promoted, how it would enhance *Means*, *Motive* and *Opportunity* and trigger action, and how smart meter data would be used. In most cases, we also suggest possible variants on the proposed package.

We see all seven packages as promising ways to reduce energy use using smart meter data. However, we are more confident about the impact and feasibility of some packages than others. All would benefit from research/testing but the need varies, broadly along the following lines.

- *Ready to use.* We are confident that these interventions will be effective if they are delivered well. It might still be worth doing some research/trialling to identify how to improve them.
- *Need research/trialling to work out how to use them.* We are confident that these interventions can be effective. Research/trialling is needed to identify how they should be used (i.e. implementation/delivery details) to be effective.
- *Need research/trialling to work out whether to use them.* We think these interventions are promising but we are not yet confident that they can be effective. Research/trialling is needed to check this and at the same time to look at how they should be used (i.e. implementation/delivery details) to be effective.

In assessing readiness, applicants could consider three kinds of issue.

- Feasibility, e.g. would all the necessary parties be sufficiently interested in developing and delivering the package (and why would they be)? Would some external funding or in-kind support need to be generated? What is the likelihood that consumers would opt in to a trial? Is there a means to identify and contact the target audience?
- Impact: is there evidence that the package (with any planned further development) would garner sufficient consumer acceptability and engagement to reduce energy use? Would consumers promote the package to other consumers?
- Timing: how quickly could the package be ready to trial?

### Package 1: Alerts about unusual energy use via an app, supported by remote control technology

| *Interventions* | *How the interventions help consumers to save energy* |
|---|---|
| *Promoting the package*<br>- Promoted directly by a supplier or third party, in specific contact or when in contact with the consumer for other reasons (e.g. with new customers, when a meter reading is needed or when a bill is issued).<br>- It could also be promoted to consumers who are on track for a high bill (Package 2).<br>- If the app is popular, word of mouth is likely to increase uptake. | Nothing specific but consumers could be encouraged to think more about consumption. |
| *Building knowledge and boosting motivation*<br>*Alerts.*<br>Using smart meter data, the app does the following.<br>- Alerts consumers to gas and electricity use that is different from usual (over a period or at a point in time).<br>- Allows them to check whether everything has been turned off or sends them a daily timed message about this (e.g. before they go to bed).<br>- Allows them to compare their use against targets they have set themselves (e.g. to ensure they stay on track or make savings).<br>- Allows them to compare themselves to other consumers, e.g. to receive an alert if their energy use goes above the average for their age, size, and type of dwelling.<br>- Gives TOU tariff change reminders if they are on a TOU tariff.<br><br>*Advice.*<br>- If consumers cannot work out what they have left on or what underlies their unusual energy use, the app includes a checklist (e.g. lights in the loft, electric immersion heater) and the option of live chat to help them work it out.<br>- The app points them to Simple Energy Advice if they would like advice about how to save more energy in general (e.g. to help meet their target). | - Acts as a trigger for taking action.<br>- Boosts motivation – alerts about unusual energy use help consumers keep their home safe, reduce accidental use of energy, and save money.<br>- Boosts motivation – comparisons against target and social comparison alerts make consumers aware that their bill is high compared to other similar consumers or compared to their own target.<br>- Makes taking action easier – consumers do not have to check they have turned things off or remember that their TOU tariff period is changing.<br><br>- Builds knowledge by drawing attention to what they might have left on (checklists and live chat) and by informing consumers about what they can do to use less energy (Simple Energy Advice). |
| *Making it easier to take action*<br>To go with the app, consumers can, if they wish, buy and install remote controls for heating, smart plugs and remote controls for appliances. | - Makes taking action easier – consumers can adjust their heating and turn off appliances from wherever they are. |

**Possible variants**

The app could be promoted through various routes, not only through suppliers, e.g. through Simple Energy Advice. The alerts could also be delivered in ways that do not rely on an app (e.g. through alerts displayed on an IHD or through SMS alerts) in order to increase uptake beyond consumers who make a lot of use of smartphones or some alternative technology (e.g. tablet, laptop, desktop computer).

A simpler DIY alternative to remote control would be for all wall sockets and sockets on extension boards to have switches.

**Role of smart meter data**

Integral to the app.

### Package 2: Advance warning for consumers who seem to be on track for a high bill, supported by personalised energy advice and practical assistance to save energy

| *Interventions* | *How the interventions help consumers to save energy* |
|---|---|
| *Promoting the package*<br>A supplier contacts customers by email, letter or SMS to:<br>- give them advance warning that they seem to be heading for a higher bill than usual, based on their smart meter data;<br>- refer them to an online energy advice website and telephone support (Simple Energy Advice) and/or offer one-to-one advice if they are likely to struggle to pay their higher bill; and<br>- suggest they get the alert app (Package 1) to help them avoid this situation in future. | - Acts as a trigger for taking action.<br>- Boosts motivation – if consumers wish to avoid high bills, they will be motivated to use less energy. |
| *Building knowledge and boosting motivation*<br>- The website walks consumers through changes they could make to their everyday behaviour and improvements they could make to their home to save energy, based on information about their home plus their smart meter data, i.e. it provides personalised energy advice. (Simple Energy Advice gives advice but this is not currently based on smart meter data.)<br>- Consumers who might struggle to pay an increased bill receive one-to-one personalised advice based on their smart meter data, preferably in-home but if that is not possible, by telephone. | - Builds knowledge by informing consumers about what they can do to use less energy.<br>- Could target more than one member of the household. |
| *Making it easier to take action*<br>Depending on the energy-saving actions identified for each consumer, the website directs them to the following or the advisor shows/talks them through the following.<br>- Online ‘how to’ videos showing, for instance, how to set central heating controls.<br>- A list of approved local suppliers, particularly installers of insulation and boilers.<br>- A list of sources of practical and financial assistance. | - Makes taking action easier by showing how to do it and how easy it is; or by taking the effort out of finding someone trustworthy to carry out work to their home. |

**Role of smart meter data**

Essential for identifying consumers on track for high bills.

### Package 3. Work-based energy advice for employees, leveraging social influence

| *Interventions* | *How the interventions help consumers to save energy* |
|---|---|
| *Promoting the package*<br>Employers registered with the Smart Energy Employers scheme (e.g. the NHS) currently let their staff know about smart meters and support them to have one fitted (e.g. by giving them time off work). This happens already but further support could be added to promote energy savings. | Nothing specific. |
| *Building knowledge and boosting motivation*<br>After installation, support is offered in the workplace to help staff get the most from their smart meter.<br>- An advisor such as a supplier's Community Liaison Officer (CLO) gives a talk about how to reduce energy use to a group of staff who have smart meters. Some suppliers already have CLOs who attend events.<br>- The advisor also offers brief one-to-one personalised advice as part of the talk for anyone who would like it, based on their smart meter data.<br>- During the talk, staff are encouraged to share their energy use with others in the group and to make a commitment about an action that they will take to reduce their energy use, referring to their smart meter data. | - Builds knowledge by informing consumers about what they can do to use less energy.<br>- Boosts motivation through social influence/support from colleagues, both at the talk and through ongoing contact in the workplace. |
| *Making it easier to take action*<br>The talk includes the following.<br>- A demonstration of how to set central heating controls.<br>- The offer of low cost kit (e.g. LED bulbs)<br>- The offer of smart plugs for employees to borrow.<br>- An introduction to additional sources of help to save energy, e.g. Simple Energy Advice and an app for alerting to unusual energy use (as in Package 1).<br>- Pointers to other sources of technology, practical assistance, and financial assistance. | - Makes taking action easier – by showing how to do it and how easy it is; offering low cost kit to save money and time; and pointing them to additional resources so they do not have to spend time looking for them. |

#### Possible variants

A similar approach could be used with other organisations that could promote smart meters, e.g. schools and community groups.

#### Role of smart meter data

To provide personalised advice face-to-face and the basis for social interventions.

### Package 4: Encouragement to rethink heating use during a cold snap, supported by personalised energy advice and the offer of smart heating controls

| *Interventions* | *How the interventions help consumers to save energy* |
|---|---|
| *Promoting the package*<br>Suppliers or a third party contact consumers by letter, email or SMS during a cold snap to suggest that they look into ways to keep warm and/or to avoid over-spending on their heating. The letter serves several purposes:<br>- refers consumers to Simple Energy Advice for advice on their heating;<br>- suggests they look into getting a smart meter if they do not already have one, to learn more about their heating;<br>- mentions smart heating controls and suggests contacting the supplier or a third party installer to find out more. | - Acts as a trigger for taking action.<br>- Boosts motivation – if consumers wish to keep warm and/or avoid high bills on heating their homes, they will be motivated to take action. |
| *Building knowledge and boosting motivation*<br>- *Smart heating controls.* The consumer is helped to understand more about smart heating controls and whether they are suitable for their circumstances.<br>- As in Package 2, a website walks consumers through changes they could make to their everyday behaviour and improvements they could make to their home to save energy, based on information about their home and smart meter data to provide personalised energy advice.<br>- As and when SMETER is available, it could also be used in providing advice, as in Package 6. | - Builds knowledge by informing consumers about what they can do to keep warm and/or avoid high bills for heating their home, and about smart heating controls in particular.<br>- Boosts motivation – smart heating controls can save consumers the trouble of having to adjust controls themselves. |
| *Making it easier to take action*<br>- *Smart heating controls.* The supplier offers smart heating controls through Eco.<br>- *Sources of assistance.* As in Package 2, website refers consumer to sources of technology, practical assistance, and financial assistance. | - Makes taking action easier by offering low cost/free smart heating controls through Eco, and by offering to install them. Smart controls make taking action easier by removing the need to set and adjust heating controls. |

**Possible variants**

There is no obvious reason to prefer these variants or the one in the table above.

- Suppliers could focus on vulnerable consumers or those with high energy consumption (especially consumption for heating and hot water if this can be identified).
- Local authorities/housing associations could contact consumers and offer them help to set their heating controls and to give one-to-one advice based on smart meter data at the same time.
- Contact eligible consumers when they are due to receive a winter fuel payment to suggest that they look into ways of saving energy to make their winter fuel payment go further.

**Role of smart meter data**

To provide personalised advice online.

### Package 5. Support for retirees to use less energy, supported by personalised energy advice and practical assistance to reduce energy use

| *Interventions* | *How the interventions help consumers to save energy* |
|---|---|
| *Promoting the package*<br>- Contact consumers who are due to retire shortly and suggests they look into ways of saving energy.<br>- The contact (1) refers them to Simple Energy Advice for energy advice and (2) suggests they look into getting a smart meter if they do not already have one. | - Acts as a trigger for taking action.<br>- Boosts motivation by targeting consumers at a time when saving money might be of particular interest.<br>- Makes taking action easier by targeting consumers when they probably have more time than when in employment to pay attention to their energy use, and when some consumers could have a lump sum to invest or an interest in DIY. |
| *Building knowledge and boosting motivation*<br>- As in Package 2, the website walks consumers through various energy efficiency improvements they could make to their home, based on information about their home plus their smart meter data, i.e. it provides personalised energy advice.<br>- One-to-one in-home advice is offered to anyone retiring on a state pension only. | - Builds knowledge by informing consumers about what they can do to use less energy. |
| *Making it easier to take action*<br>As in Package 2, website refers consumer to sources of technology, practical assistance, and financial assistance. | Makes taking action easier by showing how to do it and how easy it is; and by taking the effort out of finding someone trustworthy to carry out work. |

#### Possible variants

A similar approach could be taken with other people at moments of change, e.g. when expecting or having a baby (as having baby is an important moment of change for heating behaviour) or newly unemployed (as they are likely to be looking for ways to save money and might be spending more on their energy bills due to spending more time at home). A more general approach would involve using smart meter data to identify households where one or more members are spending more time at home.

#### Role of smart meter data

To provide personalised advice one-to-one and online. Possibly to identify households where one or more members are spending more time at home.

### Package 6: SMETER-based advice for home movers and improvers, supported by low-cost products and installation[8]

| *Interventions* | *How the interventions help consumers to save energy* |
|---|---|
| *Promoting the package*<br>Identify consumers who are likely to be making home improvements and refer them to advice about energy efficiency improvements. They could be identified through, for instance, property sales or applications for Planning approval. | - Acts as a trigger for taking action.<br>- Makes taking action easier – consumers are more willing to make large-scale energy improvements at these times, when there is already work being done on their home. |
| *Building knowledge and boosting motivation*<br>- Using SMETER, an energy advisor provides personalised advice about the most appropriate energy improvements (e.g. installing insulation or a new boiler) and the potential savings from making them.<br>- Ideally this would be done with the advisor visiting the consumer's home. The Simple Energy Advice telephone service could possibly be used, with consumers showing photographs of insulation and appliances to the advisor if needed. | - Builds knowledge by informing consumers about what they can do to use less energy.<br>- Boosts motivation by telling them how much they can save by taking action and engaging other motives. |
| *Making it easier to take action*<br>Could offer low cost installation and products, using Eco Flexible Eligibility (in which suppliers partner with local authorities) and/or collectively negotiated deals. | - Makes taking action easier by reducing the cost; and by taking the effort out of finding someone trustworthy to carry out work to their home. |

**Possible variants**

Consumers who are keen to make energy improvements could be identified in various ways (e.g. through Simple Energy Advice or any of the other packages) and then directed to the SMETER-based energy advice service and low cost installation and products.

**Role of smart meter data**

Essential for SMETER-based advice.

### Package 7: Social comparison and advice

| *Interventions* | *How the interventions help consumers to save energy* |
|---|---|
| *Promoting the package*<br>Suppliers (or a third party authorised by suppliers) offer customers ongoing information on their energy use, relative to a sample of comparable households. Those who opt in would be asked to provide sufficient information to allow a fair comparison group to be defined and for advice to be tailored. The comparison information is provided with monthly billing statements, together with tailored advice and referral to Simple Energy Advice for more general advice. | - Acts as a trigger for taking action, when opting in and when receiving statements. |

[8] See Annex B on SMETER.

| *Interventions* | *How the interventions help consumers to save energy* |
|---|---|
| *Building knowledge and boosting motivation*<br>- The advice would, as far as possible, be tailored to the household. The fact that it would be linked to the comparison data should mean that consumers see it as more relevant to them than generic advice.<br>- The principal motive (over and above any existing desire to reduce consumption) would be the social comparison. On the one hand this would be a signal that there is potential to reduce consumption, while also generating a light peer pressure or competitive drive. | - Builds knowledge by informing consumers about what they can do to use less energy, and how to do it.<br>- Boosts motivation by social comparison. |
| *Making it easier to take action*<br>The advice could include availability of financial support and/or sources of energy efficiency products and services. | - Could reduce the cost and/or take the effort out of finding someone trustworthy to carry out work to their home. |

**Possible variants**

Statements could be independent of billing statements. Delivery could be by email, post, app, text or web portal. Consumers could be given some facility to analyse the detail of the feedback or vary the comparison groups. An opt-out version could be used with reduced demand on consumers to provide information.

This is a package on its own but it could also be combined with other packages. Social comparison could, for example, make use of SMETER.

**Role of smart meter data**

Smart meter data would be required to support frequent feedback and tailored advice.

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