



Department  
of Energy &  
Climate Change

# DECC Smart Meter Small-scale Behaviour Trials Synthesis Report

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Small-scale Behaviour Trials Synthesis Report

# DECC Smart Meter Small-scale Behaviour Trials - Synthesis Report 6.0

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Research



The views expressed in this report are those of the authors, not necessarily those of the Department of Energy and Climate Change (nor do they reflect Government policy).

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# Executive summary

## Background and context

This report presents the findings of an evaluation of five small scale community based consumer engagement behaviour change trials. The work was commissioned by the Department of Energy and Climate Change (DECC) in 2013 as part of the Foundation Stage of the Smart Meters Implementation Programme (SMIP).

These trials were designed to test different community-based consumer engagement approaches aimed at reducing household energy consumption (gas and electricity), and that could potentially be deployed alongside the roll-out of smart meters. The work stems from the government's response to the consultation on the Consumer Engagement Strategy (CES) which is proposed to accompany the roll-out.

Contractors were invited to develop and implement trials that explored the impact of one or more of six drivers of energy behaviour contained in the framework set out within the CES:

- Energy literacy
- Knowledge of behaviours
- Self-efficacy
- Beliefs about outcomes
- Salience
- Social and household norms.

The CES also suggest that these drivers of energy behaviour can be influenced through six main levers, of which two were to be the focus of these community-based trials:

- Advice and guidance; and
- Motivational campaigns.

## Outline of the trials

Four contractors were appointed by DECC to develop and deliver the five community-based mini-trials over the winter in 2013/14. Four of these ran to completion and were evaluated in full:

- Global Action Plan - 'Hot Tips and Radiate Heat' projects
- Groundwork - 'Green Doctor' project
- Community Energy Direct - 'Kid Power' project
- Centre for Sustainable Energy - 'Energy Six-Pack' project.

A fifth trial was cancelled early in its implementation period due to difficulties with volunteer and participant recruitment:

- Community Energy Direct - 'Big Ask' project.

Each trial included a number of the key drivers of behaviour within the intervention design and the two levers of advice/guidance and motivation. None of the trials was able to test the effectiveness of the potential drivers of providing consumers with direct and indirect feedback on their consumption using smart meters. This was because the trials took place before the main period of smart meter installation and it was also not practicable to install and run them within the trials over a period long enough to test their impact on behaviour.

The trials are therefore only a partial test of the thinking underlying the community-based element of the CES. Other work would be needed over a longer period for the full potential of community-based initiatives in supporting behaviour change during and following smart meter roll-out, to be wholly determined.

## Synthesis of evaluation results

The evaluation study reported here was undertaken by M·E·L Research and an overall synthesis of the research evidence and evaluation findings from the four trials that ran full term is presented under the six key research questions prescribed by DECC for this work:

- Effectiveness
- Common features of success
- Adaptations to improve the trials
- Barriers to behaviour change
- Scalability
- More rigorous future evaluation

The evaluation methodology was largely qualitative due to the small size of the trials and limited participant numbers, and short time period for delivering the trials. Primary research evidence for the purposes of this evaluation was based on semi-structured personal interviews with participants, contractors and partners delivering the trials. Questions centred on implementation process (formative) and self-reported (summative) impacts. Outcomes in terms of quantitative energy consumption changes were not measured for the reasons stated above.

The main findings from the evaluation evidence were as follows.

### a) Effectiveness

The most effective interventions tested here appear to be those that:

- increased the target audiences' knowledge of ways to save energy where this knowledge was previously unknown;
- and where this was also associated with an increase in the consumer's self-belief that actions/measures were relevant and easy to undertake;
- and where certain specific motivational devices (prompts and free practical aids) also aided change.

From the trials conducted it is not possible however to distinguish the most impactful interventions in terms of the effect of the behaviour changes on eventual energy consumption as the trials did not measure this.

## **b) Common features**

The common aspects that apply to the intervention strands that meet the above criteria for effectiveness appear to be:

- a target audience which is more likely to comprise economically inactive or low income households, households in fuel poverty, and vulnerable adults; these characteristics tend proportionally to be found clustered within social housing neighbourhoods;
- effective partnership working between intervention contractor and the partner through which the consumer audience is accessed;
- where advice and guidance has been personalised and delivered at a local level; and
- where this local delivery included free practical motivational aids.

## **c) Adaptations**

Five further adaptations can be made, that could increase the effectiveness of the community-based intervention approach to behaviour change:

- incorporation of a direct feedback mechanism;
- involving trusted energy suppliers in a stronger direct relationship with the target audiences;
- longer preparation period to set up the intervention;
- deployment of enough resources appropriate to the scale and requirements of the engagement activity;
- ensuring the content of advice and guidance is more specifically focussed on what has most impact with the customer segment.

## **d) Barriers**

Several common themes have been identified as barriers that actively hold people back from making energy saving behaviour changes within community-based interventions. These are:

- lack of knowledge (low energy literacy and knowledge of behaviour);
- resistance of other family members;
- overcoming the inertia arising from current established behavioural patterns;
- other barriers relating to personal situation and circumstances.

## **e) Upscaling**

Community-based behaviour change interventions could potentially be delivered at the time of smart meter installation, but appear to have their best prospects for achieving sustained behaviour change during the post-installation follow-up advice stage.

The evidence points to the need for four principal criteria to be considered when envisaging community-based initiatives accompanying the national smart meter roll-out:

- The role of partnerships in enabling effective roll-out, i.e. third parties with local knowledge of communities;

- There needs to be adequate development of the skills and competences required by third party delivery organisations (e.g. community energy advisors) working with energy consumers;
- The costs and timescales for delivery need to be fully appreciated;
- Local or regional variations could or should be applied depending on the type of scheme.

The Hot Tips Radiate Heat intervention model, Green Doctor-type household advice, and the Kid Power school based initiatives all are potentially scaleable and could potentially have a role in supporting household energy behaviour change in the context of smart meter roll-out.

#### **f) More rigorous future testing**

These small scale trials have not provided evidence for a rigorous full-scale demonstration testing of the most promising approaches. To do this would involve:

- undertaking trials in association with smart meters and direct feedback;
- planning and delivering the trial interventions over a time period sufficient for quantitative analysis (ideally 12 months to counter seasonal effects);
- more rigorous establishment of control and intervention arms and consistent campaign delivery over the trial period;
- more rigorous application of the intervention logic model and use of evaluation data including consumer research survey data, to test cost-effectiveness, attribution, and additionality;
- inclusion of better metrics to measure the reach of the trials within the target audience, and the relative impact of individual behaviour changes on the energy consumption outcome;
- extending the scope of trials to further defined target groups such as BME and recent migrant communities; private renting tenants; early forming households and young families.

## Conclusions

The evaluation allows the following conclusions to be reached:

- community-based consumer engagement interventions are deliverable (if practical barriers are appropriately addressed) and can make a difference.
- the behaviour change logic model (based on the principle of focusing messages on the proposed drivers which produce a desired behaviour change, and using the levers of advice/guidance and motivation), appears broadly to work.
- the theoretical behaviour change frameworks (MINDSPACE and the COI behaviour change framework) are useful for designing the community-based interventions but should not be applied too restrictively.
- there needs to be a real-world test using smart meters and quantitative energy consumption data within the evaluation (for both direct and indirect feedback).
- partnerships and established community relationships are a pre-condition of the most successful community engagement work in these trials.

- there are merits in targeting the intervention on consumers within communities where there are most likely to be readily tangible benefits arising from energy behaviour change - where the perceived benefit is important, evident and achievable to the consumers.

**This research report is one of five which have been published concurrently<sup>[1]</sup>, containing the findings of DECC's programme of 'early learning' smart meter research and small-scale trials.**

**A further Policy Conclusions report summarises the key findings, and sets them in the context of further progress, since the research was conducted, to establish the delivery framework for smart metering. This report also provides the Government's conclusions about future consumer engagement policy and delivery priorities, and the steps to implement them, working with Ofgem, Smart Energy GB, suppliers and other parties.**

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<sup>[1]</sup> All publications available here: <https://www.gov.uk/government/publications/smart-metering-early-learning-project-and-small-scale-behaviour-trials>

# 1. Introduction

## Background

This report presents a synthesis of the findings of an independent evaluation of five small scale community based consumer engagement behaviour change trials, commissioned by the Department of Energy and Climate Change (DECC) as part of the Foundation Stage of the Smart Meter Implementation Programme (SMIP). These trials were designed to test different community-based consumer engagement approaches to reducing household energy consumption (gas and electricity) that could potentially be deployed alongside the roll-out of smart meters.

These community-based consumer engagement trials form part of the Government's response to the consultation undertaken in 2012 on the proposed Consumer Engagement Strategy (CES) to accompany the smart meter roll-out<sup>1</sup>. As noted in that response, "*consumers will only receive the full benefits of smart meters if ... they use [it] to change their energy consuming behaviours*" (para 3.1). The CES noted that providing information alone would be unlikely to change attitudes and behaviours. Instead, consumer engagement should seek to use a full range of six drivers of energy behaviour:

- **Energy literacy** – e.g. understanding how energy is wasted; the benefits of energy efficiency; likely candidates for energy-hungry appliances
- **Knowledge of behaviours** – a wider knowledge and understanding than energy literacy, including comfort with technology and how to go about home improvements
- **Self efficacy** – the extent of control an individual has over their behaviour, including whether they feel empowered to change their behaviour or not; it is underpinned by energy literacy and knowledge of behaviours
- **Beliefs about outcomes** – beliefs about the desirability of the new behaviour
- **Salience** – personal relevance and how high a priority energy saving is; recognising the link between energy and tangible concepts like cost and waste
- **Social and household norms** – how others act and how we believe they act; this incorporates cultural habits and the concepts of social proof and peer pressure

Following consultation DECC concluded that supplier engagement would be supported by a programme of centralised engagement undertaken by a Central Delivery Body (CDB), now established as Smart Energy GB. The role of trusted third parties is also acknowledged in the CES, which Smart Energy GB could facilitate and coordinate.

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<sup>1</sup> Smart Metering Implementation Programme: Government Response to the Consultation on the Consumer Engagement Strategy, DECC, 2012

The DECC CES consultation also elicited views from some respondents, who argued that an element of geographical coordination of consumer engagement, involving a community-based approach, might be particularly effective especially for vulnerable and low income consumers, and those from more disengaged communities that are harder to reach.

The trials evaluated here were therefore designed to test the effectiveness of a number of simple, cost effective, engagement materials, propositions or interventions that might be delivered by Smart Energy GB and suppliers, potentially with the involvement of third parties and/or a community component. They were designed to contribute to the knowledge base from which Smart Energy GB and energy suppliers may judge which types of community-based customer engagement approaches have most potential to encourage energy saving when carried out as part of or alongside or following installation for smart meters, in particular for low-income, pre-payment meter and vulnerable consumers.

The DECC CES consultation document also originally indicated that the main drivers of energy behaviour, listed above, could be influenced through six main levers:

- Direct feedback (e.g. via In Home Display devices)
- Indirect feedback (e.g. historic consumption data contained on energy bills)
- Advice and guidance
- Motivational campaigns
- Consumer incentives
- Market levers.

DECC concluded that the Consumer Engagement Strategy should not focus on the last two of these levers, while the first two (direct and indirect feedback) were not feasible to examine within the timescales set for the trials. It should also be noted that as the trials were conducted over a period prior to the main installation stage of the smart meter roll-out, they do not provide a test of the effectiveness of community-based interventions within this operational context. The trials therefore focus on tests of community-based interventions that centre on advice/guidance, and motivational campaigns, which also included provision of associated physical devices to aid motivation. The trials also test the practicability and logistics behind community engagement – a further purpose highlighted for testing in the CES consultation response (para 3.21).

## Operational description of the trials

The trials examined in this report were therefore based upon testing a range of interventions centring on advice/guidance, and motivational campaigns and devices. The trials were also targeted in large part on communities in which vulnerable consumers were likely to be particularly prevalent.

The design guidance issued by DECC for the trials also required that the nature of the intervention should reflect current knowledge on behaviour change as identified within the Central Office of Information (COI) behaviour change framework and the MINDSPACE behaviour change model (for further details of this see Technical Appendix 1).

Four contractors were appointed by DECC to deliver five community based mini-trials over the winter in 2013/14. Four of these ran to completion and were evaluated in full:

- Global Action Plan - 'Hot Tips and Radiate Heat' projects
- Groundwork - 'Green Doctor' project
- Community Energy Direct - 'Kid Power' project
- Centre for Sustainable Energy - 'Energy Six-Pack' project.

A fifth trial was evaluated up to the point it was cancelled due to difficulties with volunteer and participant recruitment:

- Community Energy Direct - 'Big Ask' project

## Summary of Trial Delivery

### Hot Tips/Radiate Heat Trial

Target audience	Housing association tenants on pre-payment meters
Location	Bolton, Blackburn and Darwen
Intervention group size	500 households split into 5 equal intervention groups
Timing and duration of trial	w/c 6 <sup>th</sup> January to w/c 13 <sup>th</sup> January 2014

#### Summary of intervention methodology

Delivered by Global Action Plan, this Trial consisted of the following intervention strands:

**Sub-group 1: Hot Tips leaflet with general ask by letter** – 100 participants received by post the '8 hot tips for winter' leaflet, '8 hot tips for winter' magnet, sticker, and the pass it on card.

**Sub-group 2: Hot Tips leaflet with peer ask by letter**– 100 participants received by post the '8 hot tips for winter' leaflet, 'peer ask' by letter, '8 hot tips for winter' magnet, sticker, and the 'pass it on' card.

**Sub-group 3a: Hot Tips leaflet with peer ask in person (community peer)** – 50 participants received in person the '8 hot tips for winter' leaflet, 'peer ask' in person from a community peer, '8 hot tips for winter' magnet, sticker, and the pass it on card.

**Sub-group 3b: Hot Tips leaflet with peer ask in person (ambassador)** – 50 participants received in person the '8 hot tips for winter' leaflet, 'peer ask' in person from a paid ambassador, '8 hot tips for winter' magnet, sticker, and the pass it on card.

**Sub-group 4: Hot Tips + Radiate Heat leaflets and radiator key** – 100 participants received by post the '8 hot tips for winter' leaflet, bleed your radiator information sheet, '8 hot tips for winter' magnet, radiator key, magnet, sticker, and the pass it on card.

**Sub-group 5: Radiate Heat leaflet and radiator key** – 100 participants received by post the bleed your radiator information sheet, radiator key, sticker, and the pass it on card.

#### Behavioural hypotheses tested

The COI behavioural hypotheses being tested were whether 'Advice and Guidance' based interventions can address barriers of:

- Energy literacy and knowledge of behaviour
- Self-efficacy
- Salience
- Social and Household Norms

The Trial also tested the 'Messenger' and 'Incentives' aspects referenced by the

MINDSPACE behaviour change framework.

## Green Doctor Trial

Target audience	Those living with Long Term Conditions and those living in fuel poverty
Location	London (Islington and Tower Hamlets) and Leeds
Intervention group size	600 households in total. 300 in London, 300 in Leeds.
Timing and duration of trial	Phase A: w/c 4 <sup>th</sup> Nov – w/c 9 <sup>th</sup> Dec 2013 Phase B [co-creation]: w/c 9 <sup>th</sup> Dec-w/c 30 <sup>th</sup> Dec 2013 Phase C: w/c 6 <sup>th</sup> Jan – w/c 10 <sup>th</sup> Feb 2014
<p><b>Summary of intervention methodology</b></p> <p>Delivered by Groundwork UK, this Trial consisted of the following intervention strands:</p> <ol style="list-style-type: none"> <li><b>Green Doctor Door Knock</b> – This involved 50 participant households in each area for phase A &amp; C of the Trial and consisted of a Green Doctor providing information, products, and instructions regarding pledges, after a short conversation with residents on their doorstep.</li> <li><b>Green Doctor In-home</b> – This involved 50 participants in each area for phase A &amp; C of the Trial and consisted of a Green Doctor providing in-home advice and guidance, demonstrating and fitting products, and requesting five simple pledges to undertake new behaviours</li> <li><b>Community peer</b> – This involved 50 participants in each area for phase A &amp; C of the Trial and consisted of a Community Peer providing in-home advice and guidance, demonstrating and fitting products, and requesting five simple pledges to undertake new behaviours</li> </ol> <p>The Trial was split into three phases;</p> <ol style="list-style-type: none"> <li>Implementation Phase A – 150 household visits in London, 150 visits in Leeds</li> <li>Implementation Phase B – Audience testing, co-design and campaign refinement</li> <li>Implementation Phase C – 150 visits in London, 150 visits in Leeds using revised materials</li> </ol>	
<p><b>Behavioural hypotheses tested</b></p> <p>An 'Advice and Guidance' intervention, addressing barriers of:</p> <ul style="list-style-type: none"> <li>Energy literacy and knowledge of behaviour</li> <li>Self-efficacy</li> <li>Salience (specifically personalisation and messages)</li> </ul> <p>Also testing the following factor referenced by the MINDSPACE behaviour change framework:</p> <ul style="list-style-type: none"> <li>Messenger</li> </ul>	

## Kid Power Trial

Target audience	Pupils in Year 5 and 6
Location	York
Intervention group size	134 pupils across 2 schools
Timing and duration of trial	w/c 4 <sup>th</sup> November – w/c 16 <sup>th</sup> December 2013
<p><b>Summary of intervention methodology</b></p> <p>Community Energy Direct worked with two local schools to provide a programme of eight sessions (a school assembly, six in-curriculum maths lessons and a final community/after school performance session). There were 2 classes participating in one school, and 2 classes participating in the other school.</p> <p>The pupils in one school were provided with a clip-on energy monitor to monitor their electricity use, as well as taking part in the lessons; these are highlighted in this report as the IHD School. The pupils in the other school received exactly the same course of lessons but did not receive an energy monitor; these are highlighted in this report as the Control School.</p>	
<p><b>Behavioural hypotheses tested</b></p> <p>An 'Advice and Guidance' and 'Direct Feedback' intervention, addressing barriers of:</p> <ul style="list-style-type: none"> <li>• Energy literacy and knowledge of behaviour</li> <li>• Beliefs about outcomes</li> <li>• Self-efficacy</li> <li>• Salience</li> <li>• Social and household norms</li> </ul> <p>Also tested the following factors referenced by the MINDSPACE behaviour change framework:</p> <ul style="list-style-type: none"> <li>• Messenger (information delivered as part of school curriculum)</li> <li>• Affect (will parents' behaviour be influenced more because they care about their children)</li> </ul>	

## Energy Six Pack

Target audience	5,000 dual fuel OVO customers who have a fuel bill in excess of £2,500 per year
Location	Nationwide
Intervention group size	90
Timing and duration of trial	w/c 2 <sup>nd</sup> December 2013 – w/c 13 <sup>th</sup> January 2014
<p><b>Summary of intervention methodology</b></p> <p>5,000 OVO customers were invited to sign up to a supported email programme (via regular email over a six week period) designed to prompt and support them to make changes to their behaviours.</p> <p>This Trial was split into two intervention strands.</p> <ol style="list-style-type: none"> <li>1. <b>Direct sign-up</b> – 2,500 OVO customers were sent an email inviting them to sign-up and participant in the Trial.</li> <li>2. <b>Quiz sign-up</b> – 2,500 OVO customers were sent an email with an online smart energy consumer quiz prior to being invited to sign-up and participate in the Trial.</li> </ol>	
<p><b>Behavioural hypotheses tested</b></p> <p>The COI behavioural hypotheses being tested were whether ‘Advice and Guidance’ and ‘Motivational devices’ based interventions can address barriers of:</p> <ul style="list-style-type: none"> <li>• Energy literacy and knowledge of behaviour</li> <li>• Belief about outcomes</li> <li>• Self-efficacy</li> <li>• Social and household norms</li> </ul> <p>Also tested the following factors referenced by the MINDSPACE behaviour change framework:</p> <ul style="list-style-type: none"> <li>• Priming</li> <li>• Commitment</li> <li>• Ego</li> </ul>	

## Big Ask

Target audience	General Public
Location	Bradford
Trial sample	Trial Cancelled
Timing and duration of Trial	4 weeks (rolling recruitment beginning w/c 4 <sup>th</sup> October 2013 and ending w/e 29 <sup>th</sup> November 2013)

The premise of the Trial centred on whether, if someone was asked to give a small show of support for an energy-saving cause, this will increase the likelihood that they would act on a bigger energy-saving request soon afterwards.

Community Energy Direct planned to work with their Energy Smart Champions to encourage a sample of their local community to show support for a small linked cause; a petition to support local households to reduce their energy usage and manage their energy costs. Energy Smart Champions would visit local community events to recruit participants to sign the petition (Test Group).

A Control Group would be recruited in the same way as the Test Group but participants would not be asked to sign the energy efficiency petition.

Two weeks later, both groups of participants would be asked to undertake an energy saving action - using their heating for one hour less a day for four consecutive weeks (the "Big Ask").

Practical difficulties in implementing The Big Ask meant that it was not possible for CED to deliver the Trial within the required timescales. The Trial was cancelled on 6<sup>th</sup> December 2013

### **Behavioural hypotheses intended to be tested**

A 'Motivational campaigns' intervention, addressing barriers of:

- Energy literacy
- Salience

Also intended to test the following factors referenced by the MINDSPACE behaviour change framework:

- Priming
- Commitment
- Ego

M·E·L Research was commissioned in the summer for 2013 to provide an evaluation of the programme of community-based consumer engagement trials. An individual project evaluation had been completed for each of these trials and the specific intervention arms or sub-strands within them. These are reported separately using nine research questions:

- Does the intervention appear to lead people to actively reduce (or manage) their energy consumption or not?
- Why did (or didn't) the intervention appear to work?
- Which barriers to changing behaviour (if any) did participants identify?
- Which benefits of changing behaviour (if any) did participants identify?
- Were apparent changes in behaviour associated with changes in any drivers from the COI model (e.g. energy literacy, salience)?
- How was the intervention delivered? Was it delivered as intended?
- How might the intervention have been more effective or more efficient?
- Were there any unintended consequences of the intervention?
- What is the cost of the intervention per person reached?

## Objectives of the Synthesis report

M·E·L Research was also asked to provide an overall synthesis of the evidence generated by the individual trials, with the objectives to:

- Learn which interventions are potentially effective for supporting energy use reduction.
- Understand how interventions were delivered and worked in practice.
- Understand whether inferred or indicative changes in behaviour are associated with changes in the drivers of behaviour set out in the Central Office of Information review of evidence.
- Learn which approaches could potentially be implemented as part of a smart meter roll-out.
- Bring together process and impact findings to make an overall assessment about which interventions might be worth further experimental testing.

In meeting these key objectives, DECC identified six specific research questions to be addressed within the overall synthesis:

1. Which interventions appear to be most effective at driving energy saving (or managing) behaviour?
2. What do the most apparently effective interventions have in common, if anything?
3. What common adaptations might make interventions work better?
4. Which barriers commonly hold back people from actively reducing their energy consumption (if any)?
5. Which interventions could be scaled up for national delivery? What would be required for local, regional or national roll-out?
6. What can we learn about how the most impactful interventions could be tested more rigorously in future?

This report presents the synthesis of evidence against each of these six research questions.

## Structure of report

The synthesis report is in two parts: Part A contains a summary of the evaluation methodology in the following section 2, followed by the main research findings in section 3 for each of the six synthesis research questions answered sequentially. The final section 4 presents a brief discussion and final conclusions from the evaluation.

Technical Appendix 1 contains a more detailed explanation of the trial hypotheses and the evaluation methodology, while Technical Appendix 2 contains examples of the communications materials used within the trials. The findings from the five individual trials themselves are presented in a set of separate reports accompanying this overall Synthesis Report.

# Overview of Methodology

This section presents a brief overview of the evaluation methodology, full details of which are provided in Technical Appendix 1.

## Features and constraints intrinsic to the intervention method

The community-based consumer engagement trials were formulated on some basic principles and assumptions intrinsic to this approach to securing behaviour change within target audiences. Part of the purpose of the trials and associated evaluation was to examine these assumptions and limitations.

Social marketing has emerged as a method used to influence social behaviour by adapting marketing and behavioural sciences to the task of seeking to influence population behaviour towards a desired social norm. It is applied in fields as diverse as health behaviours, transport modal shift, pro-environmental behaviours and recycling. Various theories of social and behavioural change (such as the Theory of Reasoned Action<sup>2</sup>) have been developed and the trials reported here sought to use the MINDSPACE<sup>3</sup> and COI behaviour change frameworks. The evidence justifying the use of these approaches was contained in the CES and it has been assumed the approaches are valid in this context.

More generally the theories of behaviour change suggest the use of communications should ideally be accompanied by changes to the physical and / or economic environment in order to facilitate the desired changes in behaviour. In the trials reported here, the scope for adding any wider enabling measures for energy saving was very limited. The trials were largely restricted to communicating messages in a motivational context.

As discussed in further detail below and in the following section 3, the impact of the trials was measured only through self-reported behaviours. No independent validating observations were made so the evidence is intrinsically limited by this fact.

The extent of the impacts of these assumptions and limitations on the trial methodology as a whole is considered in the discussion section later in the report.

## Practical constraints on the trial design and evaluation methodology

In the specification set out by DECC for this work, it was originally envisaged that the trials would be designed to allow for a robust and rigorous evaluation framework to be constructed, with matched control and intervention groups, and with comparisons between pre-intervention baselines and post-intervention changes. This design would have allowed a summative (impact)

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<sup>2</sup> Cabinet Office (2010) *Influencing Behaviour Through Public Policy*. Mindspace Behavioural Insights Team, [www.cabinetoffice.gov.uk](http://www.cabinetoffice.gov.uk).

<sup>3</sup> MINDSPACE is an acronym for a behaviour change framework developed by the Cabinet Office (2010) comprising the themes of Messenger, Incentives, Norms, Defaults, Salience, Priming, Affect, Commitments, and Ego. <http://www.instituteforgovernment.org.uk/publications/mindspace>

evaluation to be made against clearly defined counterfactuals; trials would be observed, and participants and stakeholders engaged, in order to derive data on the ways the trials worked out in practice (process evaluation).

It was therefore intended that the trials would be carried out in a relatively tightly controlled environment and that both qualitative and quantitative data would be produced, including quantitative data on self-reported energy behaviours.

In practice the trials were undertaken in the context of community-based activity that was not controllable to the degree originally envisaged by DECC. This in itself is a key learning point from the trials. As the interventions took place in a 'real world' setting, few of the instruments necessary to allow for a controlled external environment were available to the trial delivery contractors:

- They were faced with the need to make pragmatic everyday changes to the detail of their project delivery, and to respond to external constraints placed upon them by partners beyond their direct control (for example, third party volunteer recruitment in the Big Ask trial and the Leeds site of the Green Doctor trial).
- Trial participants did not have smart meters. These trials were undertaken in the Foundation Stage of the smart meter rollout which began in April 2011. The main installation stage and consumer engagement activity - during which most GB households will become aware of and receive their smart meters - begins in late 2015 and runs until 2020. Whilst a few energy suppliers have been installing significant numbers of smart meters during the Foundation stage, the vast majority of GB energy consumers at the time when these trials were undertaken (late 2013 to early 2014) would not have had a smart meter. These small-scale trials were set up in order to provide evidence on effective approaches to energy saving that could be deployed alongside the smart meter rollout in advance of the main installation stage (late 2015) - this required setting them up and delivering them in a short time period which would not have been sufficient to coordinate for all trial participants to have smart meters installed. Indeed it would have meant significantly altering the trials to include this requirement and to reflect the fact that participants would have needed to be customers of the two main suppliers installing smart meters at the time.
- As consumer participation in the trials was voluntary, and recruitment to the trials was largely opportunistic, the numbers of participants in the evaluation and their socio-demographic composition could not be systematically controlled and so varied from trial to trial, and also between separate intervention arms within each trial.
- Each trial tested a range of variations in the intervention approach, but these intervention strands could not in practice be constructed so that they were run on matched samples; comparison of the results from these intervention arms could not then confirm the observed differences were attributable to the differences in intervention.
- In only one trial (Kid Power) was a control group established and in that case it was still not feasible to select participants rigorously enough to be sure that the control was a matched replica of the intervention group.
- For the most part, numbers of participants in the trial were not large enough to allow for quantitative statistical surveys to be undertaken; instead the participant experience was measured largely qualitatively through semi-structured interviews, with a limited degree of quantification made possible through content analysis to create respondent categories (mainly limited to dichotomous data in the form of 'claimed behaviour change made: yes or no').

- Quantitative energy consumption data was not used to measure impacts thus limiting outcome measurement to the qualitative reporting of self-perceived behaviour changes. The rationale for this was that in order to robustly measure any change in energy consumption, ideally twelve months of energy consumption data would be required pre and post intervention (to control for seasonal effects). This was not possible due to the short period available for set up and reporting of the trials.
- Although the degree of ‘reach’ of the trials to their target audience was envisaged in the project concept as an indicator of the capacity of the intervention model to efficiently engage members within a target community, the contractors (with the exception of OVO within the Energy Six Pack trial) were not able to supply reliable measures of this.
- Finally, the experimental and developmental nature of the trials meant that adaptations to the approach and content of the trials needed to be made as the trial progressed. While this is an essential feature of developmental trials, which are learning to adapt previous models to this new energy setting, by the same token these real-time variations erode the degree of systematic rigour in the evaluation evidence.

For all these reasons, the evaluation eventually undertaken for these trials was substantially constrained from that originally envisaged. The evidence has been refocused on the aspects of the trials that could be reliably observed largely through qualitative, post-intervention participant and contractor / partner survey interviews using semi-structured questionnaires. The survey research design, which delivered this evidence, is summarised below.

## Field research design, delivery and analysis

Evaluation data was gathered in qualitative semi-structured interviews with a sample of participants in the four completed trials and with contractors and their partners involved in delivering all five trials. Contractor progress reports, risk reports, email correspondence and meeting notes for all five trials were analysed, along with a limited amount of quantitative demographic profiling data gathered about the characteristics of trial participants.

### Quantitative pre- and post-intervention, control and intervention data

Pre-trial and post-trial structured questionnaire survey data from 217 participants in the Hot Tips and Radiate Heat trial was compared to responses from 392 people from a loosely matched sample who did not take part in the trial. A small number of participants in the Energy Six-Pack trial completed an online questionnaire survey.

### Qualitative data from semi-structured post-intervention interviews

The sample for the semi-structured interviews with trial participants consisted of:

- **Hot Tips & Radiate Heat:** 124 interviews (sampled from 500 trial participants - housing association tenants on pre-payment meters).
- **Green Doctor:** 134 interviews (sampled from 609 trial participants - housing association tenants that were fuel poor or had long term health condition).
- **Kid Power:** Interviews with fifteen families (sampled from the families of c.130 children from four classes at the two schools that participated in the trial).
- **Energy Six-Pack:** 32 interviews (sampled from 90 trial participants – OVO Energy customers with energy spend of over £2,500 a year).

Semi-structured interviews were carried out according to a design that was intended to elicit evidence on participants' perceptions of trial performance, following lines of enquiry set out in Part B. Interviews were recorded digitally and key parts then extracted and entered into an electronic database for further analysis.

The pattern of response was further examined through a content analysis in which the qualitative evidence from trial participants was systematically categorised, coded and counted to provide a categorical measure of the effectiveness and impact of the trials (see Technical Appendix, Section 2, sub-section 2.3.5: Measuring outcomes). The results of this analysis were tabulated to provide a broad overview of the comparative effectiveness of different aspects of the trials, in driving energy-saving behaviours.

# Findings

## Synthesis question 1: Which interventions appear to be most effective at driving energy saving (or managing) behaviour?

This research question is the most fundamental and multi-faceted of the six specified for this project. We have interpreted the question and sought evidence to answer it, by reference to the fundamental logic model for the trials.

All of the trials, in one way or another, sought to stimulate new energy saving behaviours amongst the trial participants within a community setting, by providing advice and guidance on energy saving behaviours, and/or by offering a range of stimulus devices, physical or motivational, to complement the advice and guidance. The logic model behind each trial is essentially that by increasing:

- people's knowledge of good energy-saving behaviours;
- their belief that these were simple and easy, and effective to carry out; and
- and their motivation for doing it (inputs); and
- by delivering this in an effective and engaging way (process);

then positive energy-saving behaviour changes would result (outputs), leading to reduced energy consumption (outcome).

The evaluation sought to measure the effectiveness of these inputs and processes on consequent behaviours, by using the data gained from semi-structured qualitative interviews. The data from these interviews was analysed by thematic patterning and content analysis in order to associate comments from the participants' responses on the new knowledge acquired, the ease of applying it to their behaviour, and the perceived relevance and motivation within their own lives, and the consequent self-declared changes in the relevant behaviours.

As the trials did not include an absolute measure of any changes in the household energy consumption (see 'Practical constraints on the trial design and evaluation methodology', p.12), the measures of change effected by the trials were gained through an assessment of the 'driver variables', such as knowledge, self-efficacy and motivation, and then by asking respondents to 'self-report' any behaviour change. The trials that were found to be effective in achieving improvements in the driver variables were deemed by implication to be the most effective in producing actual energy-saving behaviour change. The evidence validating the logic model supporting this presumption was set out in the Government's response to the consultation on the Smart Metering Consumer Engagement Strategy.

A further consideration in assessing the relative effectiveness of the trials is their ability to effectively reach the target audience within the community setting. A consideration of this aspect of trial effectiveness is therefore also included in answering this research question.

### Summary of the most effective interventions

To summarise, the most effective types of interventions tested appear to be those that have:

- increased the target audiences' knowledge of ways to save energy where this knowledge was previously unknown;
- where it was also associated with an increase in the self-belief that actions/measures were relevant and easy to undertake;
- and where certain specific motivational devices (prompts and free practical aids) also aided change.

Interventions that triggered the above appear to have led to greater prevalence of claimed energy saving behaviour amongst participants. Personalised message delivery appears to have created added impact compared to passive materials.

Linked to these findings, the two most effective trials are therefore logically those that have been most successful in combining these intervention elements within their trial design:

- The first of these involved the intervention delivered in-home by either a trained professional or by a local volunteer within the Green Doctor trial. In these interventions, participants were provided with one-to-one advice and received demonstrations on the use of energy saving measures.
- The second most effective intervention is offered in two variants of the Hot Tips Radiate Heat trial. '*Sub-group 2 (Hot Tips peer ask by letter)*' showed the biggest impact in getting participants to claim a change in behaviour, although '*Sub-group 1 (Hot Tips general ask by letter)*' had a similar proportion of respondents reporting having made an energy saving change.

The detailed evaluation evidence justifying these overall conclusions, is now discussed in more detail below.

### Effectiveness in increasing knowledge of energy-saving behaviours

The first element of the logic model to be considered is the improvement of knowledge on positive energy saving behaviour. Table 1 shows the number of respondents that claimed to have learnt something new following an intervention. It should be noted that the nature of this data is qualitative, and as such it gives a broad sense of the relative effectiveness of the different trials in increasing knowledge of energy saving behaviour. Using content analysis, each respondent was classified into a 'did/did not claim increased knowledge' dichotomy, and a 'did/did not claim to change behaviour' dichotomy, with the results as shown in this table.

**Table 1: Number of respondents claiming to have learnt something new**

Trial	Intervention	Number interviewed	Claimed increase in knowledge	Claimed change in behaviour
Green	Green Doctor in-home	47	28	41

Doctor	Green Doctor door knock	38	18	25
	Community Peer	49	33	41
	<b>Total</b>	<b>134</b>	<b>79</b>	<b>107</b>
Hot Tips / Radiate Heat	Sub-group 1: Hot Tips leaflet with general ask by letter	19	9	15
	Sub-group 2: Hot Tips leaflet with peer ask by letter	24	9	19
	Sub-group 3a: Hot Tips leaflet with peer ask in person (Community Peer)	14	6	9
	Sub-group 3b: Hot Tips leaflet with peer ask in person (Ambassador)	13	3	5
	Sub-group 4: Hot Tips leaflet + Radiate Heat leaflets and radiator key	25	11	12
	Sub-group 5: Radiate Heat leaflet and radiator key	29	13	13
	<b>Total</b>	<b>124</b>	<b>51</b>	<b>73</b>
Energy six-pack	Direct sign up	20	2	9
	Quiz sign up	12	4	9
	<b>Total</b>	<b>32</b>	<b>6</b>	<b>18</b>
Kid power	Lesson and device school	10	5	8
	Lesson only School	5	0	5
	<b>Total</b>	<b>15</b>	<b>5</b>	<b>13</b>

The primary target audience for the Green Doctor and Hot Tips & Radiate Heat Trials focused on those who had a long-term health condition, were fuel poor or were on a pre-payment meter. There were only a small number of respondents who participated in the evaluation that had previously proactively looked for energy saving advice. Therefore these two trials appear to be targeted on an important audience with a low pre-existing level of knowledge, and also a high personal benefit potentially gained from applying the knowledge to reduce energy consumption.

Where respondents had previously undertaken any energy saving measures prior to participating in these trials, the measures were seen to be mainly passive in nature. For example, their housing association had made changes for them or they had been given low energy lightbulbs from their energy supplier. This context may actually diminish consumers' inclination to actively seek out ways of adapting their own behaviours, as illustrated in the

following quotation from a respondent in the Hot Tips & Radiate Heat Sub-group 2 (HT peer ask by letter) intervention:

*“I didn’t get any [information about saving energy in my home prior to participating]. I don’t remember receiving any or seeing any information on TV. I’ve not really looked, because the housing association has given us fantastic insulation and double glazing.”*

The advice and guidance given in both of these trials had the greatest impact in improving energy literacy. To give a sense of comparative scale across the trials, around six out of ten respondents in the Green Doctor Trial and four out of ten respondents in the Hot Tips & Radiate Heat Trial claimed to have learnt something new. This compares to around two out of ten respondents in the Energy Six Pack Trial, and around three out of ten families in the Kid Power Trial.

The interventions which feature within the Green Doctor Trial and the Hot Tips & Radiate Heat Trial are broadly similar with regard to their impact in increasing energy literacy and for both of these trials, increasing energy literacy had a positive impact on apparently driving energy saving behaviour change. This is demonstrated by a comment made from a fuel poor respondent in the Green Doctor, London Phase A, In-home visit intervention. This respondent claimed to have made an energy saving behaviour change which was expected to help reduce their energy bill as a result of learning something new.

Figure 1: Green Doctor Trial Advice and guidance leaflet

*“A lot of the advice was new to me. It was useful in telling me that I should have a 4 minute shower instead of a bath... also to turn plug sockets and lights off. It was very relevant in how to bring my bills down. It was the right advice.”*

By comparison with these two trials, the target audience for the Energy Six Pack Trial were OVO Energy customers with a high energy spend of over £2,500. Of all the interventions, respondents from the Energy Six Pack trial were the most likely to claim to have made energy saving changes prior to participating in an intervention and to have already actively looked for a range of information regarding saving energy.

This is illustrated by a comment made by one respondent who had proactively looked for information regarding saving energy and made an energy saving change prior to participating in the Trial.

*“I previously installed any insulation and low energy light bulbs I could find, pvcs on the roof and trying to set up meters to record energy consumption.”*

Note that this respondent had installed these physical measures and behaviours actively, on his own initiative, in comparison with the housing association tenant illustrated earlier who had not then been prompted to consider personal behaviour change, and where the trial intervention had made much more impact

Due to the high proportion of Energy Six Pack respondents that had previously actively looked for information, only 6 of the 32 respondents interviewed in this intervention evaluation claimed to have learnt something new as a result of participating in the Trial. This may also be a



particular feature of the type of customer segments of this specific supplier (OVO). Few participants claimed to have made an energy saving behaviour change as a result of the trial and it would appear from the consumer interviews that this prior knowledge was the primary reason for this lower level of further behaviour change (although the email-based delivery mechanism was a further contributory factor as outlined later). A telling comment below, was made by a respondent who was already knowledgeable about saving energy and therefore did not learn anything new by participating. It shows that in this instance the respondent did not go on to make an energy saving behaviour change as a result of the Trial; this is typical of the views of many respondents in this group:

*“Good, but I’m already knowledgeable in that area so wasn’t expecting to be blown away by it, I could have done with a bit more in-depth information with some issues and a bit more of the pros and cons of some of the issues. For example LED bulbs, they’re very efficient but not worth upgrading to if you’ve already got energy efficient bulbs.”*

For the Kid Power interventions, respondents indicated that they did not generally look for energy saving advice and information as they were already aware of things they could do; they claimed their existing energy saving behaviour was relatively good. This existing energy saving behaviour was primarily linked to the objective of reducing on-going costs.

Following their child’s participation in an intervention, respondents did not necessarily identify an increase in their knowledge, yet they did often indicate a greater relevance to their own lives (salience) resulting from energy saving behaviours. This centred on a better appreciation of the potential to achieve additional cost savings, related to actions the household could take including adjustments to the usage of different appliances within their home. Making cost savings (achieving salience, primarily in the eyes of the parent bill-payer) appeared to be the driving force behind the apparent claimed household changes in behaviour, rather than learning more about energy usage per se (increased knowledge, acquired directly by the children).

One parent also valued the increased knowledge that his child had gained which would hopefully help in their energy saving:

*“I don’t think I learnt anything that I wasn’t aware of. I think for him to learn that at school and to be aware of it increases our knowledge in the home of energy use... If you don’t know how much things are costing you... if you don’t have a monitor... you’re just not aware of really the impact of doing lots of things... like constantly leaving a light on in the house or forever using your tumble drier.”*

In summary, from this evidence, the interventions which appear to have been the most effective at driving energy saving behaviour change through improved knowledge, are those where the target audiences had the least prior knowledge of actions/measures they could take. Typically, they had not previously actively sought energy saving advice and guidance. Starting from in effect a low baseline, it is logical that this is where the biggest impacts from a knowledge-boosting intervention are to be made.

A further key conclusion from this section is the benefit to be gained from matching the appropriate degree of complexity and applicability of the advice, to the consumer’s prior level of knowledge. The trials were not devised to provide this degree of customisation except that it will be implicit in the more personalised one-to-one model for the Green Doctor and Hot Tips / Radiate Heat delivery mode versus that of, for example, the Energy Six Pack trial. In that trial the delivery mode was an electronic communication involving a standard worded email with

weblink to further standard guidance. The trial did not test for customisation of its contents, such as a personal energy consumption statement for the householder.

### Effectiveness of prompts and free physical aids (motivational devices)

Participants in most of the trials received a range of physical devices, prompts and/or gifts designed by the trial operator to act as motivators for changing behaviour. These incentives cover two main categories: physical devices, and trigger stimuli (psychological motivational devices). This section explores the role of such devices in driving energy saving behaviour.

#### a) Physical devices aiding motivation

Physical motivational devices, in the form of gifts and equipment, were used in three of the four Trials: four devices in Green Doctor (snuggle blanket, temperature gauge, shower timer, and hot water temperature gauge), one in Hot Tips & Radiate Heat (radiator key) and one in Kid Power (clip-on energy monitor). The aim was to drive energy saving behaviour change through usage of the devices, although each operating in very different ways.

In the Green Doctor Trial, the most commonly used piece of equipment was the ‘Snuggle Blanket’. Around two out of three respondents claimed to have used it. However, when looking at the intended outcome of turning down heating by one degree, the impact of the ‘Snuggle Blanket’ decreases, with only four out of ten respondents having claimed to have undertaken this associated action. Nevertheless, use of the ‘Snuggle Blanket’ provided a level of wellbeing and comfort and appeared to reduce the need to regularly increase the level of heating. For example, a fuel poor respondent in the Leeds Phase A In-home visit intervention, described the way the blanket was used to save energy:

*“My blanket to keep me warm... because it keeps you warm when it's chilly. It saves you turning the heating up, where normally I would bang the heating up full... but now I think I can leave the heating and put my blanket on to keep warm so I don't have to bang the heating up. Unless it's really cold, then I have the heating up a bit and blanket because I hate being cold.”*

Although usage rates were lower, the temperature gauge used in the Green Doctor Trial appears to be a stronger motivator for intended energy saving behaviour change. Over half of respondents who used the temperature gauge also turned down their heating, as a respondent in the Leeds Phase C Door-step visit intervention told us:

*“I made changes because I use the temperature card, if it says 18 I turn down the heater.”*

Of the remaining two devices used in the Green Doctor Trial, a shower timer and a hot water temperature gauge, evidence suggests that neither were extensively used nor did they prompt many to undertake the associated energy saving behaviour.

The radiator key which featured in the Hot Tips & Radiate Heat trial, although not as impactful as the Snuggle Blanket and Temperature gauge used in the Green Doctor Trial (in terms of usage and impetus to change energy saving behaviour), was used by around half of respondents. However this over-states the additional contribution made by the intervention towards additional energy saving, as half of these had already previously bled their radiators within the last 12 months.

Notwithstanding this more limited scale of campaign impact, it should be further noted the radiator key was also found to make participants feel enabled and more likely to enact the subsequent behaviour; 8 of the 17 respondents who already had a radiator key and had already

claimed to having bled their radiator in the previous 12 months (with their own key) also claimed using the radiator key given to them as part of the intervention to bleed their radiators. The following comment is nevertheless typical of those respondents who bled their radiator as a specific result of receiving the radiator key:

Figure 2: Hot Tips Radiate Heat radiator key

*“I didn't have a radiator key, so it was useful. At least I can bleed my own radiator now, before I couldn't. It was useful to make sure the heat is constant... I've never done it in the 4 years I've been living here because I didn't think about it... I used the radiator key just after I got it to make sure the radiators work well.”*



This motivational tool was also used to test whether giving people a gift makes them feel indebted and more likely to then do the subsequent behaviour. Of the 54 respondents in Sub-group 4 and 5 respondents, 8 already had a radiator key and had already claimed to having bled their radiator in the previous 12 months (with their own key). Nevertheless, these 8 respondents also claimed using the radiator key given to them as part of the intervention to bleed their radiators.

The physical device used within the Kid Power Trial was a clip-on energy monitor for families to use at home to monitor their electricity use. [Note that this is not equivalent to an energy company provided in-Home Device (IHD) and the accompanying installation experience, and was not explicitly used in the school lesson, so the trial does not fully explore the potential effects of the eventual introduction of IHDs during smart metering rollout], Seven of ten respondents managed to install and use the device. For these respondents, most found it a useful visual prompt. For example, during an interview with a pupil and his father, the pupil said:

*“I think it was quite useful to me but it was more useful to my Mum and Dad because they could look at it and if they were angry about how much money their bills were they could look at it and start turning things off so they could get the amount they thought was good for them.”*

But evidence from several trial respondents suggests the device may have a more limited short-term interest and impact for some, suggesting the effect may not be sustained over time once the novelty has worn off. For example this is illustrated by the further comments in the above conversation, where the father added:

*“It's in a bag in his bedroom... we haven't got it attached at the moment. We had it attached for about 2 weeks or something like that. I think we used it as an awareness thing really just to realise what was possible by turning things off... but we don't continue to use it.”*

Thus, overall the evidence suggests that physical aids act as effective motivational devices; the snuggle blanket is popular while the temperature gauge appears to trigger more behaviour change. The clip-on monitor had a supportive contribution to Kid Power. Greater potential may have been possible had the device and the information gathered from it have featured more heavily within the lessons.

## b) 'Prompt' style motivational stimulus devices

Figure 3: Photo of reminder magnet used in Hot Tips Radiate Heat trial

Prompt style stimulus devices, to act as aide-mémoires, were used in three of the four Trials: Green Doctor (prompt card), Hot Tips & Radiate Heat (reminder magnet, and ticking commitments on '8 hot tips for winter' leaflet), and Energy Six Pack (clicking on a commitment on the web portal). These devices were designed to prompt energy saving behaviour change via a commitment to undertake certain actions or being reminded of the advice and guidance given.

The reminder magnet used (Figure 3) in the Hot Tips & Radiate Heat Trial appeared to be the most effective form of prompt style motivational device used across the Trials. Three out of four respondents claimed to have put up the magnet. Two out of three indicated that the magnet had a positive effect in reminding / prompting them to change their behaviour, and its permanence on the fridge worked as a continuous reminder. This is evidence in the comment by a respondent from the Sub-group 3 (HT peer ask in person) intervention:

*“I put it up. It says that you can put it up so you can remember the tips. I put it on the fridge with my other magnets. It does remind me, without it I would forget to turn off lights. It is a good size, it's quite big. I think if it was small you wouldn't see it. I can see it every day.”*



Figure 4: Pledge card used in Green Doctor trial

In the Green Doctor Trial 'pledges' (Figure 4) were made by participants to undertake energy saving actions. However, during the evaluation interviews, few spontaneously (i.e. without the interviewer prompting them) reported that they had taken any energy saving action that related directly to their pledges. Very few could actually recall that they had a pledge card

For the Hot Tips & Radiate Heat Trial, the impact of making a pledge or ticking a commitment was found to be somewhat limited. Only a small proportion of respondents (14 of the 95 respondents) claimed to have completed the '8 hot tips for winter' leaflet to specify the energy saving changes that they planned to undertake.

Although a higher proportion of participants clicked on a commitment in the Energy Six-Pack Trial the impact this had on participants making an energy saving change related to that commitment is limited; only 7 of the 18 respondents who clicked on a commitment claimed to make an energy saving change related to that commitment.

It would appear therefore, that 'pledges' may not be a useful mechanism to help many people change their behaviour when used in this way.



An interesting case in contrast to this finding is shown below; this respondent selected tips from the '8 hot tips for winter' leaflet which created a positive impact in changing their energy saving behaviour.

*“I selected 3 tips, the one about spending 3 minutes less in shower, turning the computer off and bleeding the radiators... The only thing [energy saving behaviour] that was new and that I changed was the radiator bleeding and trying to spend 3 minutes less in the shower. I did this to save costs.”*

In summary, the use of physical devices and motivational triggers to stimulate behaviour change did appear to strengthen the overall effectiveness of the trials. The physical devices appear more impactful than the prompt-style psychological stimuli of pledges and tip-lists.

### Effectiveness of different delivery mechanisms

As well as the substantive content of the trials, based on inputting advice and guidance to consumers supplemented with supportive motivators, two trials - Green Doctor and Hot Tips & Radiate Heat – also tested the impact of three different pairs of approaches to the process of message delivery:

- delivered by paid energy professionals / ambassadors, compared to community peer volunteers (in both trials)
- delivered in person compared to by letter (Hot Tips & Radiate Heat)
- messages delivered on the doorstep compared to in-home (Green Doctor)

For both the Green Doctor Trial and the Hot Tips & Radiate Heat Trial, there was found to be little evidence of difference in the impact of delivering the intervention through an unpaid community volunteer and a paid professional/ambassador in terms of the proportion of participants who claim to go on to undertake an energy saving behaviour change (within each separate trial). This is illustrated by comments made by two respondents about the Hot Tips & Radiate Heat 'Peer Ask' visits. The first comment is about the community peer volunteer intervention, while the second reinforces the point from the paid ambassador intervention:

*“I thought it was fine, it lasted about 10 minutes. I think it's better to have a visit because you are told to do things there and then. With post you put it off but because she went through it with me I knew about it straight away and I could ask her things like about washing towels at 30 degrees. I hadn't seen her before but she showed me her ID badge.”*

And on the paid ambassador approach:

*“It was better [than if they would have received the pack in the post], it made me more likely to read and put up the pack contents. I didn't know the person who delivered it. It didn't make any difference.”*

The data was explored to identify any detectable differences in the impact of receiving a request to make an energy saving change through personal contact, as compared to receiving this request through a letter.

- For Hot Tips and Radiate Heat the evidence is inconclusive. This is due to similar outcomes in the proportion of respondents who claimed energy saving change for both these intervention types – delivered in person and delivered by letter. Note that little additional input to the consumer came from the personal delivery, except that of the

personal contact with an individual deliverer as compared to standard non-contact postal delivery.

- By comparison, for the Green Doctor Trial, respondents who received an in-home visit were more likely to claim to have made an energy saving change (over 8 out of 10) than those respondents who had a doorstep only visit (over 6 out of 10). This is probably attributable to the additional time spent with participants in an in-home visit, where motivational devices were also fitted and demonstrated, providing a clearer and more interactive intervention. In contrast, in the doorstep approach, items were simply handed over following a short discussion.

Overall, the evidence indicates that the in-home delivery of messages within the Green Doctor approach adds considerable value to the intervention, noting however that a commensurate level of additional resource is entailed in this form of delivery.

### Trial take-up

As discussed in the introduction where the scope of this research question on trial effectiveness was discussed, an important factor is the effectiveness of each trial in reaching its target audience. This was not a very thoroughly or systematically measured element of the trials and as a result the evidence on relative effectiveness of reach is limited.

The overall effectiveness of the Energy Six Pack Trial approach was limited due to the low sign-up rates to the Trial. In the original Trial design, the delivery partner CSE expected 250 participants to sign up out of the 5,000 OVO customers who were invited to participate. However, only 90 OVO customers in the end signed up to the Energy Six Pack Trial, which meant there was a far lower than expected sign up rate. The Quiz sign-up intervention route seemed to further depress sign up rates compared to the standard invitation; only 29 participants out of 2,500 invited signed up through this mechanism compared to 61 out of 2,500 who signed up to the email invitation without being offered the quiz entry route.

The Kid Power Trial was the easiest route for take-up by its target audience due to the captive nature of audience it was targeting - children in schools. When exploring take-up of the Trial by schools themselves, four of the six schools that were invited to participate expressed an interest in running the Kid Power Trial. Of these four, two similar schools were selected to participate in the Trial. The first hurdle of take-up therefore seemed to be relatively easily surmounted, particularly when relating the energy content to the basic curriculum, and then the classes / parents selected by the school participated more or less fully. This is therefore a highly managed and controlled take-up route, with predictable results in participation, once the motivation to secure school participation has been attained through a direct link to the established curriculum, rather than proposing it as an add-on.

The Green Doctor Trial originally aimed to reach its target audience (fuel poor and long-term health condition) through establishing links with community, resident and other local groups. The study found working in partnership with the Housing Association to be an easier and more accessible way to identify and reach the target audience than the less formal community groups. The interventions in Leeds eventually also took this route, although community links to a suitable Housing Association were not as well established as those in the London setting. This resulted in the recruitment of less effective volunteers, who found it harder securing good take-up than those in the London trial. This trial model therefore found it was most effective at reaching its target audience through the intermediary role of social housing providers, especially those where a strong community infrastructure also already exists. Although evidence is thin, in broad terms the contractors felt that for a given level of resource, the use of the established housing association relationship probably doubled the reach of this approach.

Unfortunately, a profile of tenants from the Housing Associations involved was not available for this evaluation, nor was the incidence rate of the number of door-knocks to participant sign-up from the contractor. This means we are therefore unable to fully assess how far the participants were representative of the overall tenant base, and we cannot estimate the absolute reach of this Trial proportional to the size of the target audience. However it should be noted that the aim was to select priority customers (fuel poor and / or with disabilities) through the recruitment process – the aim was not to reach as many tenants as possible but to identify the key households for targeting. The evidence elsewhere in this section appears to suggest that this method of reaching a highly targeted sub-group, within which the intervention was then introduced, was relevant and effective.

For the Hot Tips & Radiate Heat Trial, Global Action Plan used an external agency 'Place First' to help aid recruitment of both the Housing Associations and Trial participants. Recruitment of individuals involved an initial postal mail out to invite tenants to participate, which was then followed up by phone call to encourage participation. Around 100 participants were recruited through the postal mailing, with the subsequent 400 recruited from a phone call. The suppliers were not required to produce data on the reach as a proportion of the target audience approached so there is no substantive evidence to draw upon.

To summarise the evidence on take-up, each trial used a different method for recruitment and laid down different criteria for defining their target audience. A simple comparison of reach and achieved audience profile is therefore not achievable in this evaluation. Nevertheless, with the exception of Kid Power conducted in schools, it is possible to observe that there were challenges in meeting target numbers for take-up; the greater the resource expended on personalisation of the recruitment approach, the more clearly the trials secured their target audience, and that the use of intermediary agencies (schools and housing associations) have also added to the effectiveness of the trial in terms of reach and securing the target audience.

### Summary of the most effective types of intervention

To summarise, the interventions which appear to have been most effective at driving reported energy saving behaviour change are those whose target audience had the least prior knowledge of any energy saving actions. This was most prevalent in the Green Doctor and Hot Tips & Radiate Heat Trials where the primary target audience were fuel poor and/or living with long term health conditions. The advice, guidance and motivational devices used within these two trials have impacted on a greater proportion of participants, increasing their levels of energy literacy, salience and self-efficacy.

This is based upon the premise that the most effective interventions appear to be those that have increased the target audiences' knowledge of ways to save energy:

- where this knowledge was previously unknown;
- where it was also associated with an increase in the self-belief that actions/measures were relevant and easy to undertake;
- and where motivational devices (prompts and gifts) also aided change.

Overall, the specific interventions delivered in-home as seen in the Green Doctor Trial, appeared to be the most effective with proportionally more respondents claiming to have made a change in their energy behaviour as a result of the intervention, compared to all others. These interventions, whether delivered by either a trained professional or by a local volunteer, both appear to be equally effective. This suggests that effective delivery of one-to-one advice and demonstrations on the use of energy saving measures is not primarily dependent on the degree of professional expertise of the advisor. There are different forms of relevant experience and

expertise, all with the potential to assist householders to make positive behaviour changes through the direct face-to-face engagement approach.

It should also be borne in mind that these interventions were specifically targeted at audiences where the financial benefits of energy saving will have had high salience and the existing baseline of knowledge is likely to be particularly low. These factors will also have contributed to the effectiveness of this trial, partly by virtue of the audience selected and not just through the substantive nature of the delivery mechanism.

The comparatively lower levels of effectiveness apparently demonstrated by the Kid Power and Energy Six Pack Trials would appear to be due to the less intensive level of advice and guidance being delivered. In the case of the Kid Power trial, this could be due to the advice and guidance not being delivered directly to the bill payer, although the use of children as 'messengers' within the home, e.g. using appliance labels did generate impact and could be an effective component of a local smart meter roll-out. In the Energy Six Pack interventions, the information was already known to most of the audience and the content could be deemed to be too low level/simplistic for this target audience. The sign-up rates for the Energy Six Pack Trial were also much lower than expected, possibly accentuated by the remote and non-personal method of contact; low take-up of this trial was also exacerbated in the Quiz sign-up intervention, which seems to have acted as an obstacle rather than incentive to sign-up. No other Trial suffered from a lower than expected participant base.

For any further interventions designed to be delivered to high energy spend audiences, careful consideration needs to be given to developing a more appropriate level of advice and information and more effective delivery mechanism for this group.

The use of simple motivational devices has also appeared to have helped promote and reinforce energy saving behaviour. The most commonly used physical motivational device was the 'Snuggle Blanket' used in the Green Doctor Trial, although the temperature gauge used in the same Trial appears to be a stronger motivator for intended energy saving behaviour change. The magnet used in the Hot Tips & Radiate Heat Trial appeared to be the most effective prompt style motivational device for encouraging energy saving behaviour used across the Trials.

Overall the physical motivational devices appeared more effective than the psychological prompt-style stimulus triggers such as pledges, and tip lists.

## Synthesis question 2: What do the most apparently effective interventions have in common, if anything?

The previous section assessed the effectiveness of interventions by comparing reported energy saving behaviour changes associated with the different interventions. The most apparently effective interventions are the two in-home forms of intervention delivered by either a trained professional or by a local volunteer within the Green Doctor trial, and the Sub-group 2 (Hot Tips peer ask by letter) and Sub-group 1 (Hot Tips general ask by letter) within the Hot Tips Radiate Heat trial. There are a number of common aspects to the four individual arms of these interventions.

### Target audience

Firstly, the target audiences for the interventions were broadly similar. The Green Doctor interventions targeted social housing tenants that were classified as fuel poor and/or living with long term health conditions. For the Hot Tips Radiate Heat interventions the target audience were social housing tenants on pre-payment meters, who were potentially more likely to be economically inactive households, low income households, households in fuel poverty, and vulnerable adults.

These audiences, living as housing association tenants, appear to benefit from advice and guidance they previously had not had; salience in terms of experiencing efficient heating and lower costs; and self-efficacy in believing they can achieve the behaviour changes required.

### Effective partnership working

The second common element between these two trials/four interventions was an established and trusted partnership between delivery contractors and Housing Associations. This enabled both parties to collaborate effectively in identifying the target audience and enabling an accessible and mutually trusted way of approaching consumers to participate. The most successful interventions used these existing relationships with housing associations; either a one-to-one direct working relationship (Green Doctor) or brokered through a relationship with a third party organisation (Hot Tips Radiate Heat).

Aside from identifying and accessing the target audience for participation in an intervention, both these trials also sought volunteers to train and deliver interventions. The strength of the existing working relationship had a direct bearing on the quality and reliability of the volunteers that were recruited to provide the on-the-ground delivery of the intervention. This was most apparent in the Green Doctor trial; the London site involved a good relationship with a housing association, resulting in the recruitment of a reliable and consistent volunteer team. By comparison, the relationship with the housing association used in Leeds was much less well developed, and this appeared to contribute to the recruitment of less reliable volunteers, and operational delays in securing arrangements for trial delivery.

The problems arising from a lack of partnership working/use of existing relationships were also highlighted in the least effective trial, The Big Ask. This trial also required the use of volunteers to deliver community engagement. Problems with sub-contractors led to delays in recruitment and the small number of volunteers eventually recruited ultimately led to the cancellation of this trial. The two extracts below from interviews with the contractor project managers illustrate the contrasting experiences in approaches to partnership working and the resourcing of volunteers. Where the relationship already exists:

***“They [HA partner] were very quick in recruiting the number of people that we wanted. They’re the organisation that initially had the contacts***

*with the housing providers so they're the ones that negotiated the involvement of the specific housing providers."*

*Project Manager, Hot Tips Radiate Heat trial*

However where the relationship is poorly developed:

*"We had intended for them to be one of our project partners in effect, so we had seen them as being an integral part of the delivery team.... but after four weeks of the program we just felt they weren't able to offer the program management we had understood that they could offer so that's why we cancelled that contract and moved it back in-house."*

*Project Manager, The Big Ask trial*

### **Personalised relationships with consumers**

A further common element in approach across the four most apparently successful intervention strands, was the personalisation of the interventions. Within the most effective Green Doctor interventions, this personalisation was delivered as one-to-one advice in a participant's home. For the most effective Hot Tips Radiate Heat intervention, Sub-group 2 (Hot Tips peer ask by letter), participants received a letter, which featured a photo and the signature of the 'peer'<sup>4</sup>. The peer requested that recipients join them in participating in the trial, shared which of the tips they would be acting on and asked the participant to choose tips on the hot tips for winter leaflet, suggesting energy saving changes that they will be trying.

This compares to the Energy Six Pack trial where participants were sent an email requesting participation by their energy supplier. The receipt of an email request was much less personalised than the two approaches discussed above. This resulted in just 90 people signing up to the trial out of 5,000 invitees.

What is further implied in this analysis is the use of peers and trusted third parties in achieving the personalisation. The trials were not structured in a way that allows the influence of personalisation to be separated from the role of the trusted peer relationship, as the interventions packaged these two characteristics together in the offer. What can be said however, is that the delivery of personalisation through the role of peers and trusted third parties is a common feature of the most apparently effective intervention strands.

### **Use of motivational devices**

The final common element for the four interventions was the use of physical devices that acted as motivators for changing behaviour. These were designed to supplement the advice and guidance, and make it easier for participants to make changes to their energy usage behaviour. The range of devices is covered in more detail in Synthesis question 1: Effectiveness of prompts and free physical aids (motivational devices).

The forms of physical device, and the ways in which the motivational devices work to enhance intervention effectiveness, varied across the trials and were specific and integral to the individual trial. They were not replicated across different trials and for this reason it is not possible to tell which physical device was more instrumental in success than others. However, as already highlighted in the findings related to Synthesis question 1 earlier across the four

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<sup>4</sup> The definition of a 'peer' for this trial was someone who lived in the same geographical region in housing stock managed by the same Housing Association.

most apparently successful intervention strands, it is evidence that a motivational device is present somewhere within the mix.

## Summary

As highlighted in Synthesis question 1, the most effective interventions increased the target audiences' knowledge of ways to save energy where this knowledge was previously unknown, associated with an increase in the self-belief that actions/measures were relevant and easy to undertake, and where certain specific motivational devices (prompts and free practical aids) also aided change.

The common aspects that apply to the intervention strands that meet the above appear to be:

- a target audience of low income households, households in fuel poverty and vulnerable adults; these characteristics tend proportionally to be found clustered within social housing neighbourhoods;
- effective partnership working between intervention contractor and the partner through which the consumer audience is accessed;
- where advice and guidance has been personalised and delivered at a local level;
- and where this local delivery included free practical motivational aids.

## Synthesis question 3: What common adaptations might make interventions work better?

This section draws upon the evidence from the trials to consider adaptations to the community-based customer engagement interventions that might improve the effectiveness of the delivery and impact on behaviour.

Five overarching conclusions on further adaptations can be made:

- Incorporation of a direct feedback mechanism;
- Involving an energy supplier in direct relationship with the target audiences;
- Longer preparation period to set up the intervention;
- Deployment of resources appropriate to the scale and requirements of the engagement activity;
- Ensuring advice and guidance is more specifically focussed on what makes most impact.

These are now discussed in further detail.

### Use of direct feedback as an instrument to drive behaviour change

The provision of direct feedback to the household on levels of energy consumption was originally envisaged in the customer engagement project concept, as it is a key element underpinning the smart meter behaviour change programme.

However no participants in the trials had a smart meter, and the Kid Power trial was the only trial that included an intervention with an IHD mechanism, (a clip-on electricity monitor) for participants to access energy/cost saving data. This means that a key element in the COI behaviour change model, direct feedback, potentially a powerful driver of behaviour change, was not tested in four of the five trials, and only partially in the fifth.

Trial contractors suggested, during evaluation briefing meetings and stakeholder interviews, that the lack of a direct feedback device on energy usage may have weakened the 'beliefs about outcomes' and 'salience' aspects of their intervention. Their perception was that this weakened the credibility of the benefits being promoted in the trials, as the actual achieved benefits for participants from behaviour change were un-evidenced to consumers and therefore relatively 'unknown'.

Contractors also indicated they would have preferred to have included some energy performance measures in their trials that could have achieved more noticeable savings, such as cavity wall and/or loft insulation. However, they also recognised the cost constraints for some within the community, e.g. the fuel poor.

- A key adaptation is therefore to add a direct feedback mechanism, both as an immediate real-time trigger, and also with easily-accessed historic time series trends to show the sustained cost and energy consumption benefits resulting from behaviour change.
- The possibility of integrating the customer engagement process, of advice and guidance coupled with motivational devices, with further physical adaptations, could also be considered.

### Incorporation of an energy supplier in direct relationship with the target audiences

The DECC CES anticipates that energy suppliers may wish to integrate community-based consumer engagement techniques within the Smart Metering roll-out, with particular reference to engagement with target audiences such as the fuel poor, hard to reach and people with disabilities. While one energy supplier (OVO) was involved in a trial (Energy Six Pack), their

customer base did not incorporate the target audience demographic. The communication channel from that trial (email/online) is also less well suited to the above groups who may be disproportionately excluded from digital communication so the trial does not test whether this approach would work with the target audiences highlighted in the DECC CES. By the same token, as discussed earlier, the content of the message (advice and guidance) was not appropriately tailored for OVO's customer base and so the trial does not test the full extent to which the approach might work with this audience had a more advanced level of customer knowledge been assumed.

As a result:

- To provide a robust test of the capability for an energy supplier to engage directly with consumer groups in the target demographic groups highlighted above, a different supplier would need to be chosen for this, and a different means of consumer engagement would need to be developed and tested, in order to allow the potential of this model to be adequately evaluated.
- To test the ability of energy suppliers to engage and change the behaviours of consumers who already have relatively high levels of knowledge, a more sophisticated version of the advice and guidance needs to be offered than in the CSE/OVO trial.
- Both of these adaptations are needed in order to come to a more robust conclusion about the potential for this kind of intervention to produce effective results.

### **Adequate lead-in times to develop partnerships to deliver the interventions**

It appears that some important aspects of the trials were designed with over-optimistic expectations of the time required in practice to engage partners, and to drive through subsequent implementation. To implement the interventions in a real-world setting this learning needs to be incorporated in the preparation time allowed in the project delivery plan.

From the information recorded in the evaluation risk registers and stakeholder interviews, it is evident that unanticipated delays to project implementation of the trials often occurred as a result of the unexpected length of time required to get agreement from multiple other stakeholders, where a diverse range of these partners were involved.

For example, the Big Ask and Green Doctor trials were delayed by greater than anticipated difficulties recruiting volunteers to deliver the interventions and this was a contributing factor in the decision to cancel the Big Ask.

- In adapting the interventions for more effective future delivery, more time should be provided to set up the intervention and get partners on board, and this need should be reflected in any delivery plans.

### **Resourcing for the needs of community engagement and partner activity**

Community-based consumer engagement often relies on securing the voluntary participation of delivery ambassadors and local partners. By definition, voluntary engagement is not directly controllable by delivery contractors and a somewhat unpredictable level of resource is required to secure this engagement. The trials have shown that an adequate provision of this resource is a key requirement for success, and the intervention designs need to be adapted to allow for this.

For example, the use of volunteers from within the community was a delivery challenge for the Leeds Green Doctor interventions. Similarly, one of the Hot Tips Radiate Heat interventions needed to be undertaken by the contractor's own community engagement team due to a lack of volunteers. The inability to recruit sufficient volunteers was the main contributory factor in the cancellation of the Big Ask Trial. Evidence gathered in the stakeholder interviews for all three of

these trials suggests the willingness, availability and competence of the individual volunteers varied substantially.

Sufficient resources, including time are required to find, recruit, train, supervise, coach and support suitable volunteers to effectively deliver these programmes, in a consistent manner. As found in earlier research for DECC – the Role of Community Groups in Smart Metering-Related Energy Efficiency Activities<sup>5</sup> (undertaken by the Energy Saving Trust) - the resources required need to be assessed and in place prior to wider roll-out of community led advice and guidance initiatives.

This important learning point in relation to community-based consumer engagement delivery mechanisms has been encountered elsewhere, for example in community recycling, composting and waste prevention schemes<sup>6</sup>.

Within the Kid Power Trial, the success of engaging with pupils appears to be linked to the experience and enthusiasm of the externally-provided energy saving teacher who delivered the intervention. If existing school teaching staff are used to deliver this type of intervention, they may need to be provided with resources to enable additional (and potentially on-going) support and training, which will need to be timetabled and in place prior to any wider roll out.

- In summary, it is easy to underestimate the resources required to deliver community engagement effectively, and future interventions need to more adequately provide for this – See the Cabinet Office report ‘Energising communities: Working with volunteers to talk about energy’<sup>7</sup>.

### **Focussing the advice and guidance on where it potentially makes most impact**

The trials indicated the value gained from centring the advice and guidance on where it makes the most impact, given the individual consumer’s socio-demographic circumstances, and their personal level of knowledge, awareness and motivational drivers. In adapting the approaches to improve their future effectiveness, an important common learning point is to shape the message (advice and guidance) around the person, and align the delivery approach to selectively engage the target audience segment. Examples of this are discussed below.

As already identified in the answer to Synthesis question 1, the effectiveness of advice and guidance appeared to be greatest where the advice and guidance was not previously known to participants, yet resonated as being relevant in producing a desired personal benefit (salience), and where the behaviour was seen to be easy and within the ability of the consumer to undertake (self-efficacy). These appear to be the conditions most conducive in prompting a declared change in behaviour.

Similarly, within the Kid Power interventions, it was not the advice and guidance that was new to participants, but rather the increased appreciation (salience) of the cost savings resulting from taking certain actions. This resonance of cost was mainly attributed to a home activity challenge that required the children to attach ‘cost’ tags to appliances around the home. These tags indicated the cost per hour of operating these appliances thus making ‘cost’ the explicit driver for change. It should be noted that the evidence is inconclusive as to whether the supply of a home energy monitor aided the salience of costs savings (this is due to the relatively low

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<sup>6</sup> WRAP 2011 ‘An Evaluation of the Impact of Recycling Advisors’, M·E·L Research for WRAP, Banbury.

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[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/355924/Energising\\_Communities\\_e-book-final.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/355924/Energising_Communities_e-book-final.pdf)

number of participants included in the evaluation sample that actually managed to set-up and use the supplied device and the relatively low level of time dedicated to the devices during the lessons).

The approach taken by the Green Doctor trial was to target the fuel poor and those living with long term health conditions. This involved a face-to-face conversation where advice and guidance could be tailored effectively and directly to the individual and their personal circumstances. Note that a key pre-condition for achieving this was that people were pre-identified as falling in this category through a door-to-door neighbourhood approach, facilitated by working in partnership with housing associations who were able to identify the target audience from their customer base. A similar approach was taken within the Hot Tips Radiate Heat trial, again with customised and personalised advice and guidance directed to the target audience of those on pre-payment meters; once again the pre-qualification of customers was facilitated by partnering with housing associations; Both Green Doctor and Hot Tips Radiate Heat show the effectiveness of highly personalised methods that can explicitly target and recruit participation from the priority consumer segments.

By comparison, the Energy Six Pack trial partnered with an independent Energy Supplier and utilised email as the delivery mechanism. This did not attract a high sign up rate (just 90 of 5,000), nor a high prevalence of behaviour change. The latter was primarily due to participants' reported prior awareness of the advice and guidance that was provided, and participants were looking for more insightful new ideas and resulting savings rather than the relatively low level advice and guidance supplied within this trial. Neither the message nor the recruitment approach were well targeted on the audience

- To conclude: interventions need to be adapted to ensure that the advice and guidance is targeted and tailored to the needs and current knowledge and awareness of the customers; and the approach delivered as personally as is practicable within the type of intervention model deployed to connect best with the target audience.

### **Summary of common adaptations to make interventions work better**

Overall, evidence from the trials has shown that the intervention approaches could be made more effective, in both operational delivery and behavioural impact, if a range of adaptations were made.

These common adaptations have been listed and should be incorporated by Smart Energy GB, suppliers or third parties who may look to these trials for evidence on how to undertake community-based consumer engagement more effectively.

## Synthesis question 4: Which barriers commonly hold back people from actively reducing their energy consumption (if any)?

A number of common barriers were identified across and between the four completed trials. These include lack of knowledge on what (more) could be done, resistance by other family members, awareness of possible actions yet a need to overcome inertia.

There were also a small number of other barriers identified by specific target audiences and from specific interventions. These barriers included people with physical limitations caused by long term health conditions within the Green Doctor interventions and where households lack control over making physical improvements to social housing homes, such as cavity wall insulation or fitting of solar panels.

### Lack of knowledge (energy literacy and knowledge of behaviour)

Interviews conducted with social housing tenants in both the Green Doctor and Hot Tips / Radiate Heat trials identified general low awareness of energy saving measures amongst this target audience, as well as a lack of knowledge of current behaviour. This is demonstrated in the comments given by two participants:

*“I wouldn't have thought to myself to turn the thermostats down in the rooms I'm not in. That would not have dawned on me... I wouldn't have considered doing that. I wouldn't have thought about timing my showers. I wouldn't have thought about turning the heating down even further, I thought it would be too cold. I wouldn't have thought about washing my clothes at 30 degrees. There are loads of things that he told me that I wouldn't have thought about doing.”*

*Green Doctor Leeds, In-home visit, Phase A*

*“I didn't do anything, I didn't realise things were left on standby wasting as much energy as if they're on. We left lights on because of the lamps. We were careful with heating, we only left it on for a few hours.”*

*Hot Tips Radiate Heat, Sub-group 2 (HT peer ask by letter)*

The research showed that advice and guidance given to social housing tenants was associated with evidence of improved energy literacy and knowledge of behaviour, and with positive reports around energy saving change within the home. Poor energy literacy and lack of knowledge about how to reduce their energy consumption may therefore be holding this population group back from actively changing their energy use behaviour.

By contrast, lack of energy literacy was not a barrier for participants interviewed in the Energy Six Pack or Kid Power trials. As discussed in research question 1, the target audiences for these two trials were much more aware of actions they could take to reduce their energy, associated to the cost. Their bigger barriers were appreciating the salience of the advice, and the difficulties of engaging the whole family in behaviour change, as discussed below.

### Resistance of other family members

The existence of social and household norms, where patterns of energy use behaviour and (bad) habits have been formed, appears to be a barrier within some households with multiple family members. The barrier mentioned most frequently in the interviews with participants from the Green Doctor and Hot Tips / Radiate Heat trials was the problem of getting other family members to make energy saving changes. This was also identified as a barrier within the Kid Power trial, with the behaviour of children in the household specifically mentioned. Although the

use of energy-cost tags on appliances appeared effective for adult behaviour, they did not have much impact on the behaviour of the children within these family households.

***“They’re children so they’re not really bothered. They just see the heat, they see the light. My little son is probably quite aware of the environment and stuff but my big son probably isn’t.”***

*Green Doctor Leeds, In-home visit, Phase A*

***“It is important to me, because I’m trying to save. The kids don’t turn off lights. It has changed... before the information we used to leave everything on but as a result of the information we don’t. This is true for the older children but not for the younger ones.”***

*Hot Tips Radiate Heat, Sub-group 1 (HT general ask by letter)*

***“Well one thing I did do was I went around the house and told other people to save energy... and the person who most didn’t do it was my sister.”***

*Kid Power, Pupil, Lesson and device school*

Barriers relating to household norms were not specifically identified by other survey respondents in the Energy Six Pack trial, although there is insufficient evidence to rule out such a barrier.

### **Overcoming inertia**

A reluctance to adopt or maintain energy saving behaviours, even when aware of the benefits of taking such action, was also demonstrated in all four trials. In some cases, the advice and guidance given in the trials seemed to act as a prompt or a reminder, providing impetus which motivated a small number of respondents to claim to have made an energy saving change, but for many, inertia meant that little or no action was taken.

***“Yes, I saw that leaving things on standby can cost a lot of money but it’s a hassle turning things off and on so I just leave it on standby.”***

*Green Doctor London, In-home visit, Phase A, Fuel Poor*

***“It’s one of those things that if you’re just getting on with your life you put it to the back of your mind (energy saving). You become a bit complacent I suppose... yes, complacent is probably the right word... so it’s a bit of a 50/50 thing really.”***

*Kid Power, Mother, Lesson and device school*

***“I would have liked to insulate the loft but it is full of stuff. I’ll do it when we next move house.”***

*Energy Six Pack, Quiz sign-up participant*

### **Other barriers**

A small number of situational and/or environmental barriers were identified by survey respondents participating in specific interventions/trials.

Within the Energy Six Pack trial, the type of property that people live in was indicated to be a barrier to changing behaviour. A number of participants indicated that their property was not suitable for some energy saving measures; homes being a listed building, an old house with solid walls, large size of home, and having sash windows were all given as examples.

***“(Would like to install) Cavity wall insulation... but we can’t do that as the house has a single brick wall. Also the house is listed so there’s a lot we can’t do.”***

*Energy Six Pack, Direct sign-up participant*

By comparison, participants interviewed in the Green Doctor and Hot Tips Radiate Heat trials suggested that certain energy saving measures were not practical for them to implement. Draught proofing, cavity wall insulation and solar panels were mentioned as measures they would like to take. However as social housing tenants, they believed these kinds of measures needed to be agreed and undertaken by their landlord. From the small number of survey respondents making comments, there is little evidence to suggest that they had approached their landlords to investigate such actions.

***“In terms of draught proofing, we wanted to do that ourselves but I think it’s up to the landlord. We were looking at how much it will cost and I don’t think it would be fair if we did it ourselves.”***

*Community Peer London, In-home visit, Phase C, Long Term Health Condition*

***“This is a council property so I can’t change anything. But there is a loss of heating through the windows, they are cheap double glazing.”***

*Hot Tips Radiate Heat, Sub-group 4 (HT general ask with Radiate Heat)*

Some participants in the Green Doctor trial gave reasons related to their physical circumstances as explanations of why they had not made or continued with changes to reduce their energy consumption, such as poor health:

***“I had energy saving light bulbs but I found it to be very bad for the eyes so I went back to have normal lights.”***

*Community Peer London, In-home visit, Phase C, Long Term Health Condition*

In summary, several common themes have been identified as barriers that actively hold people back from making the energy saving behaviour changes. These are:

- Lack of knowledge (low energy literacy and knowledge of behaviour);
- Resistance of other family members;
- Overcoming the inertia arising from current established behavioural patterns;
- Other barriers relating to personal situation and circumstances.

## Synthesis question 5: Which interventions could be scaled up for national delivery? What would be required for local, regional or national roll-out?

The SMIP consumer engagement strategy Foundation Stage involves exploring whether community-based customer engagement approaches could be scaled up to accompany the national delivery of the smart meters rollout. Synthesis question 5 therefore seeks to address that issue. It involves considering the evidence from the trials to identify lessons that might assist energy suppliers and Smart Energy GB in making their programmes more effective, by adding successful and scalable elements of community engagement to the customer journey of installation and post-installation support.

The Energy Six-Pack has produced little evidence of additional energy saving behaviour change within its audience of high energy consumers, although this may be because the messages were not adequately customised to the audience. Similarly there has been no test of involving an energy supplier with a low income or fuel poor audience, so the best step forward is to consider a further and more rigorous trial of this approach before determining its potential for scaling up and rolling out. From our analysis thus far, it is clear that the Big Ask approach fell short operationally of what was required of a successful scheme and therefore we have been unable to fully evaluate this community led model.

The three trials that have been considered as showing evidence of possibly containing effective approaches that might be applied by suppliers or other third parties to enhance behaviour change during and after Smart Meter and IHD installation, are therefore:

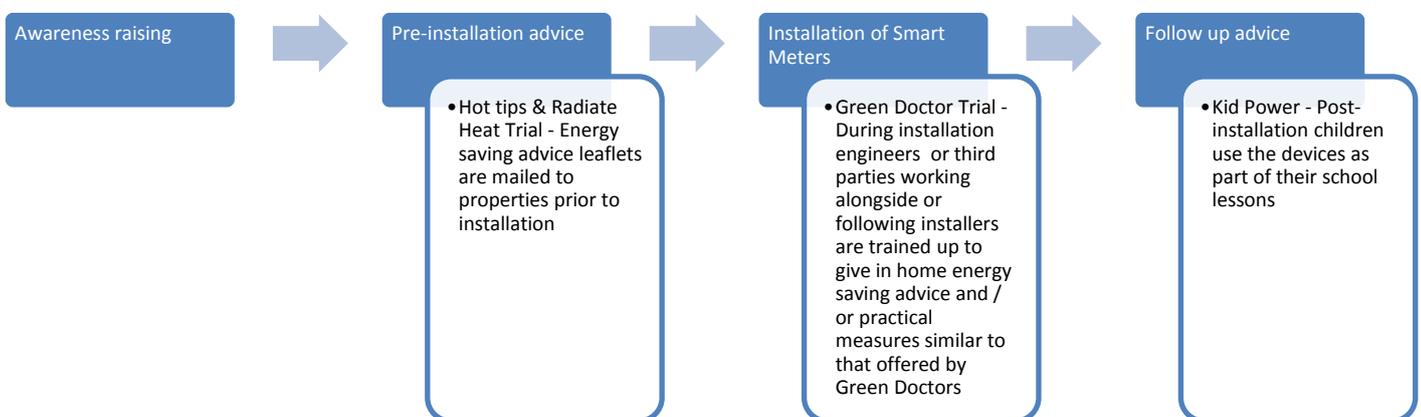
- Green Doctor
- Hot Tips / Radiate Heat
- Kid Power.

In the remainder of this section we have therefore restricted consideration of the possible scalability, and practical applicability of the lessons, to the evidence from these three trials.

### Application to stages in national roll-out

Figure 5 summarises the potential role that might be envisaged for various elements of the three trials, within the context of the four smart meters national roll-out stages.

**Figure 5: Stages of Smart Meter national roll-out**



In short, the trials have tested community-based behaviour change approaches that might best be used to support installation and post-installation support. This is partly because that is the context in which the trials have been designed (none were designed particularly around the stages of awareness-raising and sign-up) but this in itself is a reflection of the offerings felt to be most appropriate by the intervention providers.

We have considered the evidence from the trials in terms of four principal criteria relating to their potential applicability to the national roll-out:

- The role of partnerships in enabling roll-out
- The skills and competences required
- The costs and timescales for delivery
- Local or regional variations that could or should be applied

### The importance of partnerships and relationships

Each of the three trials considered here involves ‘on-the-ground’ community partners as key agents in successful delivery. This was mainly housing associations (for Green Doctor and Hot Tips / Radiate Heat) and schools (Kid Power). In each case the partner was a crucial element, in fact a gatekeeper (the trials could not have proceeded without their active engagement).

Trials used existing relationships with other organisations to access participants and the trial contractors reported positive feedback from their partner organisations. From our contact with the partner organisations it was evident that those that participated were positive about their role (e.g. some housing associations were present during our consultations and had created special ‘certificates of engagement’ for their tenants), although some partners that were approached dropped out for various reasons before entering the trial (e.g. through concerns about data protection). This partnership approach also has the potential for cost savings in roll-out, as existing staff and resources are deployed to secure consumer engagement, and the approach uses partners’ influence to reach different sectors of the community to attract consumer engagement.

In view of this evidence however, energy suppliers or Smart Energy GB would need to develop trusted relationships with the intermediary partners, in order to access this community route as a potentially successful element during roll-out. For schools, the commitment of the head teacher is an important contributory success factor along with other local partners, as discussed below.

Securing local engagement of partners from a ‘standing start’ could prove a large practical obstacle to an energy supplier and so in the context of a wider roll-out, preliminary work would be advisable in developing relationships with the partner sector at a more aggregate level. Housing associations are engaged in national groupings such as the National Federation of Housing Associations, Confederation of Cooperative Housing, BME Housing Group, and often individual associations focus their offering on particular customer group segments, around ethnicity in particular. Early relationship-building at this level could help oil the wheels prior to approaching specific associations.

Similarly, suppliers or Smart Energy GB working with suppliers could consider working across local authority schools partnerships, and developing relationships with existing organisations working with schools already, such as EcoSchools, the Co-ops Green School Revolution, the Fairtrade Foundation or Global Learning. Similarly with maths, there are a number of existing providers who would bring credibility to such an intervention such as the National Centre for Excellence in the Teaching of Mathematics.

To motivate schools to proactively take part, it would be advantageous to provide evidence of improved progression and attainment for pupils in maths through this intervention. This would take time to set up and evaluate and perhaps this could be achieved through a smaller local or

regional roll-out, or a more comprehensive trial of the Kid Power project. The contractor engaged in delivering this trial reported that the school partners felt that it would help the process if Ofsted were seen to be supportive of the idea, and that this would help in engaging schools during any scaling up of the approach during the smart meter roll-outs.

### **The skills and competences required**

The design of the Kid Power intervention could be developed by the organisations involved and be assisted by a marketing/PR company who would add the 'visual elements' for the teachers, pupils and parents. Competencies would include: delivering educational programmes; lesson planning; experience of working in primary schools; practical energy efficiency; and creating successful websites. By utilising teachers within primary schools, the indirect staffing levels are high and there is a need for training, mentoring and support (and the appropriate resources to enable this) to ensure a consistency and high quality of delivery from all schools. Staff employed to train and support teachers could be appointed on a regional basis and deliver specialist training sessions to groups of schools.

Whether delivered through housing associations or through volunteers, 'ambassador' style interventions (e.g. similar in nature to the Green Doctor approach) must ensure the advisors are suitably trained in practical energy efficiency to fit equipment and give appropriate advice. Likewise with The Hot Tips/Radiate Heat intervention, the housing association staff would need customised training to deliver the intervention effectively. Ambassador and green doctor type and Hot Tips / Radiate Heat schemes are the two interventions that would need most professional and technical resource to roll out effectively.

### **The costs and timescales for delivery**

Table 2 summarises the evidence on the cost for delivering each trial and intervention type, and the total cost per participant reached. This is not of course the same as the costs that would be entailed in implementing the interventions at scale, so Table 2 should not be taken as an absolute estimate of those costs. The trial delivery costs do however give some indicative evidence on the potential relative costs of implementing the interventions more widely. This is indicated in the right hand column labelled 'run-on costs'. These were calculated as the marginal additional cost of interacting with each participant, derived from dividing the delivery cost by the number of individual participants, i.e. by removing design and management costs from the unit cost calculation. Note that there would be further economies of scale likely to occur in any wider roll-out of the intervention, resulting in an operational run-on cost lower than that represented in Table 2.

**Table 2: Cost of each trial and intervention type per participant reached**

Trial	Intervention	Design / project management cost	Delivery cost	Total Cost	Total cost per trial particip't reached	Run-on unit cost per trial particip't reached
Hot Tips & Radiate Heat	Sub-group 1: Hot Tips leaflet with general ask by letter	£4,262	£8,164	£12,427	£124	<b>£81</b>
	Sub-group 2: Hot Tips leaflet with peer ask by letter	£4,262	£9,236	£13,499	£135	<b>£92</b>
	Sub-group 3: Hot Tips leaflet with peer ask in person	£4,262	£13,894	£18,157	£182	<b>£140</b>
	Sub-group 4: Hot Tips leaflet + Radiate Heat leaflets and radiator key	£4,262	£9,650	£13,912	£139	<b>£97</b>
	Sub-group 5: Radiate Heat leaflet and radiator key	£4,262	£8,593	£12,856	£129	<b>£86</b>
	<b>Total</b>	<b>£21,312</b>	<b>£49,538</b>	<b>£70,850</b>	<b>£142</b>	
Green Doctor	Green Doctor in-home	£19,131	£16,702	£35,833	£158	<b>£72</b>
	Green Doctor Doorstep	£19,132	£8,701	£27,833	£165	<b>£52</b>
	Community Peer in-home	£19,132	£11,014	£30,146	£142	<b>£52</b>
	<b>Total</b>	<b>£57,395</b>	<b>£36,417</b>	<b>£93,812</b>	<b>£154</b>	
Kid Power	Lesson and device school	£14,560	£15,990	£30,550	£449	<b>£231</b>
	Lesson-only school	£14,560	£10,890	£25,450	£424	<b>£182</b>
	<b>Total</b>	<b>£29,120</b>	<b>£26,880</b>	<b>£56,000</b>	<b>£438</b>	

From Table 2 within Hot Tips/Radiate Heat for example, it can be seen that the run-on unit cost of the personal visit is around 55% higher than the leaflets options, but it may be that this produces better overall value given that the personal visit appears to add extra impact. The Green Doctor trial appears to show a relatively lower unit cost than Hot Tips Radiate Heat, even for the in-home version. This may come about from the very well developed relationships that existed resulting in a high hit-rate in this trial; clearly, more detailed cost analysis should be carried out during further field tests of the intervention, so that these detailed judgments about relative cost-effectiveness of the interventions can be made on a more solid evidence base.

It is assumed that existing classroom teachers would deliver Kid Power, rather than the directly engaged individual whose costs are reflected in the data in Table 2. Under that assumption, the

main additional costs to a supplier will be associated with training, mentoring and supporting teachers and providing cover for them to take part in the training. These costs could be met by individual suppliers or Smart Energy GB but there is a probable further potential disruption or opportunity-cost impact on schools. To avoid the impression that the intervention is shifting an additional knock-on burden onto the schools, it would be helpful if evidence showed that the intervention also achieved better educational outcomes as a result – in other words that the school generates its own return-on-investment by participating<sup>8</sup>. The development of lesson plans, websites, and resources for teachers and pupils could be classified as largely one off costs; as would the time needed to bring partners together to develop and deliver the intervention. However, ongoing staff turnover means some provision would still be needed to cover training and induction of new staff.

A national roll-out of a Green Doctor type approach as a paid service would be more costly per person contacted than the other two trial models, although the evidence of extra potential impact on energy consumption amongst important targeted customer audiences might make this more cost-effective. Delivery by volunteers or Housing Association staff would be less costly. Similar to using teachers to deliver Kid Power, the main costs would be associated with training, mentoring and supporting Housing Association staff to deliver the intervention. For a volunteer approach, a number of volunteer co-ordinators would need to be employed, and individual volunteers incentivised / accredited and compensated for incidental expenses, so it could not be assumed that the volunteer delivery model is 'free', although it would undoubtedly be cheaper than relying fully on trained professionals.

The timescales involved in a larger scale roll out for both the Green Doctor type and Hot Tips/Radiate Heat interventions would depend on signing up and negotiations with housing associations. The trials have shown that this can be done within around three months, but this was largely undertaken where the trial contractors already had an established relationship with the association. For an energy supplier or Smart Energy GB to establish the relationship a longer lead time would be required. However, equally, suppliers do already in some cases have preferred relationships as suppliers to housing associations and this could provide early leverage and some may already have existing relationships with certain charities etc. which could be built upon. Green Doctor takes longer to set up because there would be slightly more training required, such as fitting and demonstrating motivational products, for the Green Doctor type intervention as there are more practical elements to the scheme.

The trial contractor suggested a minimum six month lead-in time for Kid Power, to allow for negotiation with potential partners, and further development of lesson plans, websites, and resources for teachers and pupils. The scheduling of approach is also important, as it is best to have the intervention agreed before the start of the academic year in September.

### **Area-based, local or regional variations that could or should be applied**

One of the fundamental questions to be considered in this section of the synthesis, is the degree to which it is practicable for an energy supplier to adopt a community-based customer engagement element within the national smart meter roll-out programme. As there is a diversity of suppliers operating within any local community, and indeed national governmental policies may structurally be trending towards a greater diversity in supply, it is not possible for a supplier to operate locally as if the community can be 'commandeered' by one supplier. This limits the potential scope for a purely area-based application of the lessons from the trials, as several suppliers will be operating installation programmes according to their own individual schedules. However the CES discusses the case for some level of coordination between suppliers, Smart

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<sup>8</sup>. Note that the Kid Power trial involved an external teacher, so the costs and implications of training existing teachers in-school has not yet been tested, and the contributory impact to wider educational outcomes has similarly not yet been tested.

Energy GB and third parties, and clearly this could be a means of improving the delivery of the community-based interventions which appear to have potential for scaling up.

Installation work is likely to be done on an area basis by installation engineers 'working a patch'. Installation is likely to be operationally delivered on an area basis by suppliers so an individual supplier has the opportunity to take an entrepreneurial lead in getting community engagement in the patch, associated with their installation programme. Other suppliers might then follow suit, encouraged by Smart Energy GB. It is also possible to envisage suppliers taking the lead on market segment specialisms, for example in relation to the schools or housing association-based types of intervention.

Suppliers and Smart Energy GB considering their opportunities in adding a distinctive community engagement element to their roll-out and engagement strategies, can therefore draw from the learning here to help them make these choices. They may not opt for a nationally universal mode – instead they may selectively identify areas where the exploitation of 'social capital' adds special enhanced value with selected target audience segments, but in certain neighbourhoods, localities or regions only.

With that in mind, we have looked at how the benefits of local / neighbourhood or regional identity could enhance the chances of consumer engagement being successful. For example, Kid Power could be amalgamated into a number of existing environmental education programmes. There are regional variations in school take up of these programmes. To avoid alienating geographical areas, an intervention that dovetails into the different existing schemes may be beneficial.

The Green Doctor approach (tested in these trials with fuel poor and long term condition consumers) could be targeted at localities rating high in fuel poverty and people with long term illness. These areas could be identified by fuel poverty profiling or through data on long term conditions held in social care or local public health information datasets (e.g. Public Health England ward health profiles). Housing associations should have the ability to target the Green Doctor delivery within their stock based on their own customer knowledge working with an energy supplier, to maximise the intervention locally and regionally. Similarly with Hot Tips/Radiate Heat, housing associations can tailor the intervention to the need of their residents using their own CORE tenant databases<sup>9</sup>.

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<sup>9</sup> CORE is an acronym standing for the **C**Ontinuous **R**Ecording of lettings and sales within social housing in England. It is a national database resource funded by DCLG and describes the characteristics of new social housing tenants and the homes they rent and buy. It covers both housing associations and local authority rented stock.

## Synthesis question 6: What can we learn about how the most impactful interventions could be tested more rigorously in future?

The trials were practical, small-scale pilot tests of different approaches to reducing household energy consumption through community based consumer engagement. Necessarily, the trials were exploratory and a range of different variations were used, providing several different 'intervention arms' within each trial, as summarised in the report on Research Question 1. The important point to emphasise, is that none of the trials amounted to a full scale test of a finalised 'best case' project concept.

In this section of the report we consider ways in which a stronger and more rigorous testing and evaluation could now be undertaken, for the most promising interventions. This would allow those forms of intervention to be tested against their 'best case' intervention specification, and to structure an evaluation to test an approach in a range of replicable settings, using larger samples and with quantitative behavioural measures of outcome and impact. These 'extended trial interventions' would provide a better demonstration of the 'best case' version of the intervention type, and would allow a more robust and quantitative evaluation of their effectiveness and impact to be made.

To allow the most promising interventions to be tested and evaluated more rigorously in this way, it would be necessary in each case that:

- a) A **validated, pre-tested and standard replicable model** of the intervention project concept should be signed off before a full scale demonstration project was then undertaken;
- b) The design should include an **evaluation framework** more robust and 'higher level' than was possible with the exploratory trials reported here; where possible there should be matched control and intervention groups, replicable pre- and post-intervention comparisons, and a clear and shared agreement of the counterfactual;
- c) The delivery contractor needs **adequate planning time and resources** to secure committed engagement of participating stakeholders, and the selection and engagement of participant consumers meeting specified criteria (e.g. that allow control and intervention groups to be matched). The trials reported here have shown how much work is needed to do this properly; this was underestimated in the trials and for a more robust evaluation to be undertaken there is a need for the preparatory time and resources to be acknowledged by both funder and provider;
- d) Realistically the evidence from the small scale trials suggests it may entail **anything up to 6 months** for this to set up, and the pre-intervention baseline measurement phase needs ideally around 3 months to complete within this period;
- e) It is essential that the intervention design and delivery **should not then be altered /adapted** during the full demonstration trial delivery period;
- f) Trial designs must include **sampling and recruitment**; designers should consider the population they wish to generalise to and the types of sub-groups they may wish to draw inferences about and ensure these are sufficiently represented, with a sufficient sample size to detect significant differences;
- g) Devise a more rigorous method for **measuring the reach** of the active consumer participation in the trial out of the potential target audience; this comprises a two-stage test of reach, firstly considering the partners engaged out of the partners approached, and then the consumer participants in the intervention as a proportion of those eligible and invited to take part;

- h) In the design of the evaluation, survey questions and monitoring data need to be clearly designed and agreed by partners around an agreed evaluation framework which **establishes the test criteria for quantitatively measuring the impact against counterfactual, and an agreed 'logic model'** so that attribution of benefits plausibly deriving from the intervention can robustly be inferred;
- i) Given the underlying policy objectives, it would be most useful to use 'before and after' energy data as part of the evaluation, in addition to measuring stated behavioural changes (which are subject to biases). 'Before' data may be available to suppliers, while 'after' data will require a post-intervention evaluation period of at least a year;
- j) As noted, none of the trials was accompanied by a **smart meter installation, and the use of direct and indirect feedback** as levers of behaviour change was limited only to the case of one Kid Power project. It is not possible to fully evaluate the possible benefits of using community based consumer engagement activities to accompany smart meter roll-out, without this dimension being included. This omission needs to be redressed for a more rigorous testing of the most promising interventions is to be undertaken.

These ten enhancements are essential requirements to any larger scale demonstration testing of the community based consumer engagement concept.

In addition to these general observations, the trials reported here have their own individual features that should be more rigorously tested in order for a fuller judgment to be made about their effectiveness and potential within the wider smart meters roll-out:

- **Green Doctor:** test more fully the comparative benefits of using professional vs community ambassadors to provide the in-home advice and guidance.
- **Hot tips / radiate heat:** test with a housing association and energy supplier partner in collaboration, and use a broader range of consumer engagement partners to involve the target audience in the scheme.
- **Kid Power:** test the model with established teachers taking on the project delivery, test the potential to use wider learning partnerships covering a range of schools, to generate school commitment, and test other curriculum options than maths as the setting for the learning.

A further consideration for more rigorous future testing is segmentation - developing motivational approaches for specific target audiences. Two segments not previously highlighted clearly emerge from this evaluation of the trials to date:

- **Busy young families** with children under 16;
- The fuel-poor, especially those living in poorly insulated properties in the **private rented sector (PRS)**. PRS householders were not tested in these interventions, but this is the UK's fastest growing tenure group and now exceeds the size of the recognised social housing sector.

Two further segments not specifically identified in these trials, but with community-based potential for engagement, are:

- **First time householders**<sup>10</sup>, who are starting to learn for the first time how best to control their use of energy within the home and minimise their household energy bills;
- **BME and culturally diverse communities**, whose energy behaviours, and response to the behavioural triggers of energy literacy, beliefs about outcomes, salience, and social

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<sup>10</sup> These might be identified through the Help to Buy Scheme or other lending vehicles provided that appropriate data protection measures could be agreed.

and household norms may be culturally influenced in a way not explicitly tested in the trials to date.

Cultural differences in household behaviour, beliefs about efficacy, decision making and the 'division of labour' in terms of the related decision-making within the household, may constrain the transferability of community based consumer behaviour change across diverse communities. The trials were delivered in areas with large ethnic minority populations but the evaluation did not explore the extent to which ethnic and cultural factors may affect individual household response to the intervention. This should be addressed in any future testing, to find out how far the interventions are generalizable across cultures, and the extent to which it might create more impact if the interventions were more culturally relevant and specific.

# Conclusions

## Discussion and Conclusions

This evaluation has shown that the five small scale community based consumer engagement behaviour change trials have each generated valuable evidence and learnings from which the potential viability and future application of such approaches can be considered.

### **Practicability of constructing a viable community-based consumer engagement approach**

The trials have shown that it is feasible to mount a community-based consumer engagement approach to energy-related behaviour change, although there are many practical constraints and limitations. The trials have mainly covered 'communities of place' (neighbourhoods and resident groups especially those associated with social housing), with one further 'community of interest' (an energy supplier customer sub-group). In both instances the trials have shown that consumers can be viewed not just as isolated atomised individuals or households, but as 'communities' - collections of people who have things in common and can be influenced through the extra energy and relationships that define a community as more than the sum of its parts.

A key test of the whole project concept is that by considering consumers within their social and societal context, levers of influence can be exploited that are additional to those that exist through mass advertising communications. While a lot of the power of 'community' as examined in these trials rests on communities of geographical association (people living in close physical proximity to one another and deriving a sense of common identity from this), there has been some indication through the CSE Energy Six-pack project that a geographically dispersed customer group can also be defined and approached with a consumer engagement offer.

The consumer engagement element proposed within the CES to enhance the prospects of energy behaviour change in the context of smart meter roll-out, is based on the concept of impacting on the individual 'customer' household; this work shows that it can also be helpful to define and approach people collectively as customer segments defined as 'communities'.

Delivering community-based engagement rather than individualised messages is however beset by difficulties associated with the 'uncontrolled' and to a degree unpredictable nature of people in community settings. The abandoned Big Ask trial hit problems when the expected presence and interest of people at community events did not materialise to the extent that the trial organisers had originally envisaged.

One important factor underlying the potential impact of community-based consumer engagement is the extent of 'reach' of such schemes on the target population. Little is known about the proportions of the target audience actually reached by these trials as metrics for it

were poorly developed, and as a result there was insufficient data collected on this. More needs to be known about the extent of reach achievable through these kinds of intervention, before a final view can be taken on the potential viability of these approaches within the context of a wider application.

It can be concluded therefore that community-based consumer engagement approach to behaviour change is operationally viable and practically deliverable, but implementation needs to be pragmatic and adapted to reflect wider good practice in community engagement that has been developed in other spheres (for example community regeneration projects, voluntary action and empowerment schemes).

### Applicability of behaviour change frameworks

The trials also rest on another fundamental proposition, that behaviour change interventions are more effective if the communications delivery mechanisms are organised around the current theoretical psycho-social models of behaviour change. Two conceptual frameworks deriving from this theory, the MINDSPACE and the COI behaviour change frameworks, were applied in the design stage of the trials. Contractors bidding to deliver the trials were invited to develop their initiatives through making specific use of these frameworks in shaping the 'logic model' behind their specific initiative.

The frameworks have not been applied rigorously and systematically, and it is evident that to do so would artificially constrain the creative essence of the interventions that were designed. As a result the trials could not be evaluated systematically with reference to these frameworks, as the various elements and dimensions within them are difficult to isolate and distinguish clearly enough within the trials for a systematic compilation of research evidence relating to them to be achieved.

However the limited extent of the (largely qualitative) evaluation evidence does suggest salience, self-efficacy, and the credibility of the messenger, are three elements within the frameworks that appear to be linked with the potentially more successful behaviour changes.

It can therefore be concluded that:

- the internal logic assumptions of these behaviour change frameworks can be loosely but helpfully deployed in shaping a community-based consumer engagement intervention;
- by doing so it helps to give form, shape and plausibility to the logic underpinning a behaviour change intervention;
- however, this cannot be applied too mechanistically as this is counter to the essentially fluid, creative, free-flowing and adaptable nature of real-world community-based working.

### Research evidence

The independent evaluation of the small scale trials has shown the following principal findings.

#### a) Effectiveness

The most effective interventions tested here appear to be those that:

- increased the target audiences' knowledge of ways to save energy where this knowledge was previously unknown;
- where it was also associated with an increase in the self-belief that actions/measures were relevant and easy to undertake;

- and where certain specific motivational devices (prompts and free practical aids) also aided change.

From the trials conducted it is not possible however to distinguish the most impactful interventions in terms of the effect of the behaviour changes on eventual energy consumption as the trials did not measure this.

## **b) Common features**

The common aspects that apply to the intervention strands that meet the above appear to be:

- a target audience of social housing tenants, which are more likely to be economically inactive households, low income households, households in fuel poverty and vulnerable adults;
- effective partnership working between intervention contractor and the partner through which the consumer audience is accessed;
- where advice and guidance has been personalised and delivered at a local level; and
- where this local delivery included free practical motivational aids.

## **c) Adaptations**

Five further adaptations can be made, that could increase the effectiveness of the community-based intervention approach to behaviour change:

- Incorporation of a direct feedback mechanism;
- Involving an energy supplier in direct relationship with the target audiences;
- Longer preparation period to set up the intervention;
- Deployment of resources appropriate to the scale and requirements of the engagement activity;
- Ensuring advice and guidance is more specifically focussed on what makes most impact.

## **d) Barriers**

Several common themes have been identified as barriers that actively hold people back from making the energy saving behaviour changes within community-based interventions. These are:

- Lack of knowledge (low energy literacy and knowledge of behaviour);
- Resistance of other family members;
- Overcoming the inertia arising from current established behavioural patterns;
- Other barriers relating to personal situation and circumstances.

## **e) Upscaling**

Community-based behaviour change interventions can be delivered at the time of smart meter installation but appear to have their best prospects for achieving sustained behaviour change during the post-installation follow-up advice stage.

The evidence points to the need for four principal criteria to be considered when envisaging community-based initiatives accompanying the national smart meter roll-out:

- The role of partnerships should be included in enabling effective roll-out;
- There needs to be adequate development of the skills and competences required;
- The costs and timescales for delivery need to be fully appreciated;
- Local or regional variations could or should be applied depending on the type of scheme.

#### **f) More rigorous future testing**

These small scale trials have not provided enough evidence for a rigorous full-scale demonstration testing of the most promising approaches. To do this would involve:

- undertaking trials in association with smart meters;
- planning and delivering the trial interventions over a time period sufficient for quantitative analysis (for example, 12 months to counter seasonal effects);
- more rigorous establishment of control and intervention arms and consistent campaign delivery over the trial period;
- more rigorous application of the intervention logic model and use of evaluation data including consumer research survey data, to test cost-effectiveness, attribution, and additionality;
- development of better metrics to determine the reach of the trial within the target community, and the proportional impacts of the behaviour changes made, on the energy consumption outcome;
- extend to further defined target groups such as BME and recent migrant communities; private renting tenants; early forming households and young families.

### **Final conclusions**

Overall therefore, the evaluation allows the following conclusions to be reached:

- community-based consumer engagement interventions are deliverable and can make a difference.
- the behaviour change logic model (drivers produce desired behaviour change) and levers appear to work.
- the behaviour change frameworks (MINDSPACE and the COI behaviour change framework) are useful for designing the community-based interventions but should not be applied too restrictively.
- there needs to be a real-world test using smart meters and evaluated using quantitative energy consumption data (direct and indirect feedback).
- partnerships and established community relationships are a pre-condition of the most successful community engagement work.
- there are merits in targeting the intervention on consumers within communities where there are most likely to be readily tangible benefits arising from energy behaviour change - where the perceived benefit is important, evident and achievable to the consumers.

# Appendices

# Technical Appendix 1

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# 1. Introduction

## 1.1. Background

This document outlines the methodology used to evaluate the five Trials undertaken for the Department for Energy and Climate Change (DECC) Smart Meter Behaviour Change Trials, as well as the evaluation methodology used for the overall synthesis report.

The Contractor and name of each Trial were:

1. Global Action Plan: 'Hot Tips and Radiate Heat'
2. Groundwork: Green Doctor
3. Community Energy Direct: Kid Power
4. Centre for Sustainable Energy: Energy Six Pack
5. Community Energy Direct: Big Ask

## 1.2. Evaluation questions

### Individual Trial evaluation

The synthesis draws together evidence from within and across the five Trials. Each individual Trial has been evaluated against evidence relating to nine research questions, which covered both process and impact measures for that Trial.

It should be noted that the Big Ask Trial was cancelled part way through implementation. Nevertheless, the learning from relevant questions relating to process evaluation have been included within the synthesis report.

### Process evaluation for a Trial

The seven specific questions addressed as part of the process evaluation for individual Trials were:

- Why did (or didn't) the intervention appear to work?
- Which barriers to changing behaviour (if any) did participants identify?
- Which benefits of changing behaviour (if any) did participants identify?
- Were apparent changes in behaviour associated with changes in any drivers from the COI model (e.g. energy literacy, salience)?
- How was the intervention delivered? Was it delivered as intended?
- How might the intervention have been more effective or more efficient?
- Were there any unintended consequences of the intervention?

## Impact evaluation for a Trial

The two specific questions addressed as part of the impact evaluation were:

- Does the intervention appear to lead people to actively reduce (or manage) their energy consumption or not?
- What is the cost of the intervention per person reached?

The evaluation reports for each Trial are contained in the appendix.

## Synthesis evaluation

It was the intention of DECC that the overall synthesis of the Trial interventions would be approached through six core research questions, applied to the evidence from within and across the four Trials:

1. Which interventions appear to be most effective at driving energy saving (or managing) behaviour?
2. What do the most apparently effective interventions have in common, if anything?
3. What common adaptations might make interventions work better?
4. Which barriers commonly hold back people from actively reducing their energy consumption (if any)?
5. Which interventions could be scaled up for national delivery? What would be required for local, regional or national roll-out?
6. What can we learn about how the most impactful interventions could be tested more rigorously in future?

## 1.3. Behavioural Change Models being tested

### Central Office of Information (COI) behaviour change model<sup>11</sup>

It can be seen that each Trial seeks to test a number of elements within the COI behaviour change model. Broadly the COI framework lists six key drivers of behaviour:

- Direct feedback on energy consumption
- Indirect feedback on energy consumption
- Advice and guidance
- Motivational campaigns
- Consumer incentives or disincentives
- Market (non-consumer) levers.

Of these interventions, the ones tested through the Trials in this project are:

- Indirect feedback on energy consumption
- Advice and guidance
- Motivational campaigns.

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<sup>11</sup> Cabinet Office (2010) *Influencing Behaviour Through Public Policy*. Mindspace Behavioural Insights Team, [www.cabinetoffice.gov.uk](http://www.cabinetoffice.gov.uk).

The COI behaviour change framework lists a range of consumer engagement intervention instruments which potentially influence these drivers. These interventions centre on:

- Energy literacy
- Knowledge of behaviour
- Beliefs about outcomes
- Self-efficacy
- Salience
- Social and household norms

### Institute of Government MINDSPACE behaviour change model<sup>12</sup>

A number of the Trials also tested aspects of the Institute of Government MINDSPACE behaviour change model; the Messenger, Affect and Commitments elements.

<b>MINDSPACE</b>	
<b>Messenger</b>	We are heavily influenced by who communicates information
<b>Incentives</b>	Our responses to incentives are shaped by predictable mental shortcuts such as strongly avoiding losses
<b>Norms</b>	We are strongly influenced by what others do
<b>Salience</b>	Our attention is drawn to what is novel and seems relevant to us
<b>Priming</b>	Our acts are often influenced by sub conscious cues
<b>Affect</b>	Our emotional associations can powerfully shape our actions
<b>Commitments</b>	We seek to be consistent with our public promises , and reciprocate acts
<b>Ego</b>	We act in ways that make us feel better about ourselves

Figure 3 provides a summary of the behaviour change intervention instruments that were tested across each of the five Trials.

<sup>12</sup> <http://www.instituteforgovernment.org.uk/our-work/better-policy-making/mindspace-behavioural-economics>

**Figure 3: Summary of behaviour change interventions being tested by each of the five Trials**

COI framework	Hot Tips /Radiate Heat	Green Doctor	Kid Power	Energy Six-Pack	Big Ask
Beliefs about outcomes			✓	✓	
Energy literacy/knowledge of behaviour	✓	✓	✓	✓	✓
Saliency	✓	✓	✓	✓	✓
Self-efficacy	✓	✓	✓	✓	
Social & household norms	✓		✓	✓	
<b>MINDSPACE</b>					
Affect			✓		
Commitment		✓		✓	✓
Ego				✓	✓
Incentives	✓				
Messenger	✓	✓	✓	✓	
Priming				✓	✓

The operational summaries that follow show the way Trials were designed, the evaluation sample breakdown and the specific behaviour change interventions being tested.

### 'Hot Tips and Radiate Heat' Trial

Target audience	Housing association tenants on prepayment meters
Location	Blackburn with Darwen and Bolton
Trial sample	500 households split into 5 equal intervention (sub) groups
Timing and duration of Trial	w/c 2 <sup>nd</sup> December 2013 to w/c 13 <sup>th</sup> January 2014
<b>Evaluation sample:</b>	
<ul style="list-style-type: none"> <li>• 609 x 5 minute pre-intervention structured quantitative telephone surveys amongst random sample of target audience</li> <li>• 232 x 10 minute post intervention structured quantitative telephone surveys with participants and non-participants</li> <li>• 124 x 15-20 minute post intervention semi-structured qualitative telephone interviews with participants <ul style="list-style-type: none"> <li>– 19 x Sub-group 1: Hot Tips leaflet with general ask by letter</li> <li>– 24 x Sub-group 2: Hot Tips leaflet with peer ask by letter</li> <li>– 27 x Sub-group 3: Hot Tips leaflet with peer ask in person</li> <li>– 25 x Sub-group 4: Hot Tips + Radiate Heat leaflets &amp; radiator key</li> <li>– 29 x Sub-group 5: Radiate Heat leaflet &amp; radiator key</li> </ul> </li> </ul>	

## Green Doctor Trial

Target audience	Housing Association tenants living with Long Term Health Conditions or living in fuel poverty
Location	London (Islington and Tower Hamlets) and Leeds
Trial sample	608 households in total, split into three intervention groups in two geographic locations; 305 in London, 303 in Leeds.
Timing and duration of Trial	Phase A: w/c 4 <sup>th</sup> Nov – w/c 9 <sup>th</sup> Dec 2013 Phase B [co-creation]: w/c 9 <sup>th</sup> Dec-w/c 30 <sup>th</sup> Dec 2013 Phase C: w/c 6 <sup>th</sup> Jan – w/c 10 <sup>th</sup> Feb 2014
<p><b>Evaluation sample:</b></p> <ul style="list-style-type: none"> <li>• 134 x post intervention face to face semi-structured qualitative interviews with participants: <ul style="list-style-type: none"> <li>Intervention 1: Green Doctor Advisor doorstep <ul style="list-style-type: none"> <li>– 20 x London and 18 x Leeds</li> </ul> </li> <li>Intervention 2: Green Doctor Advisor in-home <ul style="list-style-type: none"> <li>– 13 x London and 34 x Leeds</li> </ul> </li> <li>Intervention 3: Community Peer Advisor in-home <ul style="list-style-type: none"> <li>– 20 x London and 29 x Leeds</li> </ul> </li> </ul> </li> <li>• 69 x interviews undertaken covering Phase A</li> <li>• 65 x interviews undertaken covering Phase C</li> </ul>	

## Kid Power Trial

Target audience	Pupils in Year 5 and 6 (aged 9-11)
Location	York
Trial sample	134 participants across 2 primary schools
Timing and duration of Trial	w/c 4 <sup>th</sup> November – w/c 16 <sup>th</sup> December 2013
<p><b>Evaluation sample:</b></p> <ul style="list-style-type: none"> <li>• 15 x face to face semi-structured qualitative interviews with participant and family: <ul style="list-style-type: none"> <li>– 10 x Test Group school</li> <li>– 5 x Control Group school</li> </ul> </li> </ul>	

## Energy Six Pack

Target audience	OVO Energy customers - high energy users spending >£2,500 per annum
Location	Nationwide
Trial sample	94
Timing and duration of Trial	w/c 2 <sup>nd</sup> December 2013 – w/c 13 <sup>th</sup> January 2014
<p><b>Evaluation sample:</b></p> <ul style="list-style-type: none"> <li>32 x qualitative semi-structured telephone interviews with participants, plus 22 x online structured quantitative survey responses</li> </ul> <p>Intervention 1: Direct sign-ups</p> <ul style="list-style-type: none"> <li>20 x semi-structured qualitative telephone interviews, plus 14 online surveys</li> </ul> <p>Intervention 2: Quiz sign-ups</p> <ul style="list-style-type: none"> <li>12 x semi-structured qualitative telephone interviews, plus 8 online surveys</li> </ul>	

## Big Ask

Target audience	General Public
Location	Bradford
Trial sample	Trial Cancelled
Timing and duration of Trial	4 weeks (rolling recruitment beginning w/c 4 <sup>th</sup> October 2013 and ending w/e 29 <sup>th</sup> November 2013)
<p>The premise of the Trial centred on whether if someone was asked to give a small show of support for an energy-saving cause, this will increase the likelihood that they would act on a bigger energy-saving request soon afterwards.</p> <p>Community Energy Direct planned to work with their Energy Smart Champions to encourage a sample of their local community to show support for a small linked cause; a petition to support local households to reduce their energy usage and manage their energy costs. Energy Smart Champions would visit local community events to recruit participants to sign the petition (Test Group).</p> <p>A Control Group would be recruited in the same way as the Test Group but participants would not be asked to sign the energy efficiency petition.</p> <p>Two weeks later, both groups of participants would be asked to undertake an energy saving action - using their heating for one hour less a day for four consecutive weeks (the "Big Ask").</p>	

Practical difficulties in implementing The Big Ask meant that it was not possible for CED to deliver the Trial within the required timescales. The Trial was cancelled on 6<sup>th</sup> December 2013.

## 2. Evaluation methodology

### 2.1. General approach

This section of the report explains the evaluation methodology adopted for this study. It is divided into five parts:

- Evaluation design
- Evaluation data
- Limitations
- Methodology used for the synthesis evaluation
- Limitations to the synthesis analyses

### 2.2. Evaluation design

Each individual Trial has been evaluated against evidence relating to nine research questions, which covered both process and impact measures for that Trial:

#### 2.2.1. Process evaluation for Trial

The specific questions addressed as part of the process evaluation for individual Trials were:

- Why did (or didn't) the intervention appear to work?
- Which barriers to changing behaviour (if any) did participants identify?
- Which benefits of changing behaviour (if any) did participants identify?
- Were apparent changes in behaviour associated with changes in any drivers from the COI model (e.g. energy literacy, salience)?
- How was the intervention delivered? Was it delivered as intended?
- How might the intervention have been more effective or more efficient?
- Were there any unintended consequences of the intervention?

#### 2.2.2. Impact evaluation for Trial

The specific questions addressed as part of the impact evaluation were:

- Does the intervention appear to lead people to actively reduce (or manage) their energy consumption or not?
- What is the cost of the intervention per person reached?

## 2.3. Evaluation data

Evidence to answer the nine research questions, relating to each Trial, was gathered through a mix of methods including structured quantitative survey data and qualitative interviews (semi-structured face-to-face interviews or telephone interviews).

In addition, contractor progress reports (highlight reports), Trial risk reports (risk registers), email correspondence and meeting notes have been reviewed to inform the process evaluation.

Table 1 summarises the available data used within each individual Trial report. It excludes the Big Ask Trial as this was cancelled part way through implementation.

**Table 3: Evaluation data available for each Trial**

Data type / source	Hot Tips /Radiate Heat	Green Doctor	Kid Power	Energy Six Pack
Quantitative:				
• Pre-Trial telephone survey	609	-	-	-
• Post-Trial telephone survey	232	-	-	-
• Online survey	-	-	-	22
• Online activity data collected as part of the Trial	-	-	-	60
Qualitative				
• Pre-Trial stakeholder Interviews	3	4	3	1
• Post-Trial stakeholder Interviews	3	3	3	3
• Post-intervention semi-structured face-to-face interview	-	134	15	-
• Post-intervention semi-structured telephone interview	124	-	-	32
• Highlight reports and risk registers	✓	✓	✓	✓
• Email correspondence and meeting notes	✓	✓	✓	✓

Table 2 provides a summary with examples of how evidence for each of the nine Trial research questions was gathered.

**Table 4: Evaluation questions and examples of evidence to support analysis**

Trial evaluation question	Evidence base
	Semi-structured interview examples
1. Does the intervention appear to lead people to actively reduce (or manage) their energy consumption or not?	Quantitative data pre and post (frequency of energy saving behaviour) Qualitative data - what respondent was doing previously vs. what they are doing now, what are they planning to do <a href="#">Could you start by telling me your general thoughts about</a>

	<p>managing your energy use? For example, how important is managing your energy usage to you (and your family)?</p> <p>What sort of things did you do to manage your energy use, before the [Trial/intervention]?</p> <p>Do you intend to carry on with the tips to manage your energy use that the [Trial/intervention] gave you?</p> <p>Who is most likely to carry on doing these things?</p> <p>How likely are other people in your household to carry on with the changes?</p> <p>What effect do you think the [Trial/intervention] has had on the way you use energy in your home?</p>
2. Why did (or didn't) the intervention appear to work?	<p>Qualitative data on the reasons for change, the reasons for not changing</p> <p>What sort of things did you do to manage your energy use, before the [Trial/intervention]?</p> <p>Do you intend to carry on with the tips to manage your energy use that the [Trial/intervention] provided?</p> <p>Who is most likely to carry on doing these things?</p> <p>How likely are other people in your household to carry on with the changes?</p> <p>What effect do you think the [Trial/intervention] has had on the way you use energy in your home?</p>
3. Which barriers to changing behaviour (if any) did participants identify?	<p>Quantitative data - reasons for not undertaking energy saving behaviours</p> <p>Qualitative data - what had the respondent attempted to do previously however struggled/couldn't do</p> <p>What sort of things did you do to manage your energy use, before the [Trial/intervention]?</p> <p>Are there any other measures to manage your energy use that you have considered in the past but decided not to do?</p>
4. Which benefits of changing behaviour (if any) did participants identify?	<p>Qualitative data - what are the benefits of making a change</p> <p>What benefits have you seen due to the energy saving changes you have made?</p>
5. Were apparent changes in behaviour associated with changes in any drivers from the COI model (e.g. energy literacy, salience)?	<p>Quantitative data - comparing pre and post data what they knew about what they can do to save energy in the home</p> <p>What sort of things did you do to manage your energy use, before the [Trial/intervention]?</p> <p>What did you think of the information/advice given? Why do you say that?</p> <p>Was it new to you?</p>

	<p>Was it easy to understand?</p> <p>Was it interesting/useful?</p> <p>Was there anything you would like more information on?</p> <p>How relevant did you feel the information was to you and your family?</p> <p>Which of the [products/information] did you think would be most useful?</p> <p>Did you fit any of the products? Did you use them? Why/Why not?</p> <p>Which have you found in practice to be most useful? Why?</p> <p>What effect do you think the [Trial/intervention] has had on the way you use energy in your home?</p>
6. How was the intervention delivered? Was it delivered as intended?	<p>Process evaluation – comparing planned activity against delivered activity</p> <p>Stakeholder interviews, pre and post</p> <p>Highlight Reports and Risk Registers</p>
7. How might the intervention have been more effective or more efficient?	<p>Stakeholder interviews, pre and post</p> <p>Highlight Reports and Risk Registers</p> <p>Qualitative data – likelihood to make change, how easy would have been to make change, extent of making the change</p> <p>How likely would you have been to make these changes anyway? Why do you say that?</p> <p>How easy would it be to make these changes anyway? Why do you say that?</p>
8. Were there any unintended consequences of the intervention?	<p>Qualitative data – difference between planned outcomes/activity compared to actual outcomes/activity</p> <p>Have you passed on any of the advice you were given to anyone else?</p>
9. What is the cost of the intervention per person reached?	<p>Financial information provided by Contractors</p>

### 2.3.1. Qualitative data

Qualitative data was gathered to help understand meanings, experiences and behavioural and attitudinal views of participants and other stakeholders. Semi-structured qualitative interviews were conducted either face-to-face or via telephone as follows:

- 134 x 30-45 minute, in-home, face-to-face informal semi-structured interviews with participants in the Green Doctor Trial
- 15 x 30-45 minute, in-home, face-to-face informal semi-structured interviews with families for the Kid Power Trial

- 124 x 15-20 minute semi-structured telephone interviews with participants in the Hot Tips / Radiate Heat Trial
- 32 x 15-20 minute semi-structured telephone interviews with participants in the Energy Six-Pack Trial
- 4 x pre and 4 x post-Trial 30-45 minute semi-structured telephone interview with Contractor Project Managers. 15 x mix of pre and post-Trial interviews with other contractor staff, partners and stakeholders.

To guide and frame the qualitative engagement between the researcher and Trial participants during these interviews, semi-structured topic guides were developed that were designed to gain an understanding of participants' experience of the intervention. Specific questions, along with subsequent probing questions, were developed to help answer the evaluation research questions as set out in the table above. These were tailored to suit each Trial.

### 2.3.2. Quantitative data

Quantitative data, were gathered for the Hot Tips / Radiate Heat Trial (pre and post-Trial telephone surveys) and for the Energy Six Pack Trial (online activity and survey data). For the Hot Tips / Radiate Heat Trial, 609 pre-Trial and 232 post-Trial telephone surveys were completed.

The survey data were ordinal in nature (5-point Likert scales) and skewed to the lower/more positive end of each scale. These characteristics limited the types of statistical tests possible. M·E·L Research calculated 'change scores' for each participant on key survey items (i.e. pre-score was subtracted from post score). Change scores were calculated for following questions:

- Please rate on a scale of 1 to 5, where 1 is strongly agree and 5 is strongly disagree, to what extent do you agree or disagree with the following statements;
  - It takes too much effort to try and save energy in my home
  - I give a lot of thought into saving energy in my home
  - Saving energy is a low priority for me compared with a lot of other things in my life
  - It's only worth saving energy if it saves you money
  - It's not worth me doing things to help the environment if others don't do the same
  - I have tried to reduce the amount of energy I use at home
  - I think there is more I could do to reduce the amount of energy I use at home
  - I know what uses the most energy in my home
  - I feel in control of what I spend on my energy bills
- Please rate on a scale of 1 to 5 where 1 is manage very well and 5 is have severe difficulties, how you and your household are keeping up with your energy bills at the moment?
- How often; always, very often, quite often, occasionally, or never, do you do any of the following;
  - Switching off lights when leaving the room
  - Only boiling the water you in the kettle
  - Taking showers that a shorter than 5 minutes in length

- Washing clothes at 30 degrees
- Switch the TV off rather than leaving it on standby
- Switch off PC when not in use
- Switch off appliances

Statistical tests were performed to determine if the 'change scores' were different for the intervention and control groups. Different tests are appropriate depending on the distribution of the change scores (i.e. if the spread of scores is normal or skewed). Where change scores were normally distributed, mean scores were compared for the groups (independent samples t-tests). If change scores were skewed, statistical tests to compare the median between the two groups were performed (Mann-Whitney U-Tests).

It should be noted that the online survey data available for the Energy Six Pack Trial was more limited in scope; there were just 94 participants within the Trial overall. This reduced to 86 participants that could be included within the evaluation once data identifiable as 'test', 'do not contact' or where no/incorrect contact information was removed. For the online survey sent to these participants, just 22 responded. Due to the small sample size, no statistical tests have therefore been run on this data.

### 2.3.3. Qualitative data analysis

Analysis of participants' responses in the semi-structured interviews was conducted using content analysis<sup>13</sup>. This procedure for the categorisation of verbal or behavioural data, for purposes of classification, summarisation and tabulation was used to determine the relative prevalence of different categories of response in order to compare patterns of response for different intervention groups within and across different Trials.

An explanatory analysis framework grid was developed for each Trial, shaped by the research questions. Data from the semi-structured interviews was added to the framework grid to allow for content analysis.

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<sup>13</sup> Bryman, 2004, *Social Research Methods*, Second Edition, Oxford University Press, Chapter 9, p181, Krippendorff, 2013, *Content Analysis: An Introduction to Its Methodology*, Sage Publications  
Hsieh, Shannon, 2005, *Qualitative Health Research: Three approaches to qualitative content analysis*, Sage Publications

Figure 4: Screenshot of analysis framework grid

	A	B	C	D	E	G	H	I	J	K	L	M	N	O	P	Q	R	S	
1	Location	Phase	Intervention	Eligibility	ID	Could you start by telling me your general thoughts about	Prior to the visit from the Green Doctor/using your energy	What sort of things did you do to manage your energy	Are there any other measures to manage your energy	You were visited by the Green Doctor/using the Association	What prompted you to agree to the visit from the Green Doctor	Reasons for signing up - save money/ reduce bills	Reasons for signing up - benefit the environment	Reasons for signing up - energy saving products	Reasons for signing up - for more information	Reasons for signing up - prompted by phone call	Reasons for signing up - prompted by letter	Reasons for signing up - representative was from association/ friend	Reasons for signing up - aware of
2	Leeds	Phase A	Advisor - in home	Fuel Poverty	8	I think I	Ive	I basically	I can't	It might	My main	Yes							
3	Leeds	Phase A	Advisor - in home	Fuel Poverty	11	(How	Electricity	He said,	I don't	No. He's I	(So you	Yes							
4	Leeds	Phase A	Advisor - Doorknock	Long term	29	I don't	I didn't. I	The same	No. I'm	No. I	I got a								
5	Leeds	Phase A	Advisor - in home	Long term	38	I think it's	It was a	Turn my	No. I	No. (How	(You	Yes	Yes	Yes	Yes				
6	Leeds	Phase A	Advisor - in home	Long term	47	I try to be	Probably	I suppose	Not that	Yes, the	Because	Yes	Yes	Yes					
7	Leeds	Phase A	Advisor - Doorknock	Fuel Poverty	50	It's	I didn't.	The same	I can't	No. (How	Well just	Yes	Yes						
8	Leeds	Phase A	Advisor - Doorknock	Fuel Poverty	62	The	I didn't.	Nothing	Just	Yes.	He just	Yes							
9	Leeds	Phase A	Advisor - Doorknock	Fuel Poverty	68	A: It's	A: Yes	(Did you	B: If I	A: Yes I	(Did you	Yes	Yes						
10	Leeds	Phase A	Advisor - Doorknock	Fuel Poverty	74	Yes our	I didn't	Before the	Yes I	No that	Because	Yes							
11	Leeds	Phase A	Advisor - Doorknock	Fuel Poverty	95	I try to not	Well I	(Things	Not really.	No. That	He just	Yes	Yes						
12	Leeds	Phase A	Advisor - Doorknock	Fuel Poverty	101	I've never		As in	I used to	No never.	Because I	Yes							
13	Leeds	Phase A	Advisor - in home	Fuel Poverty	107	It's cost	I did get a	I tried not	That's a	No, I have	I'm	Yes	Yes						
14	Leeds	Phase A	Advisor - Doorknock	Fuel Poverty	110	When he	I didn't	Everythin	I can't	No.	Just to	Yes							
15	Leeds	Phase A	Advisor - in home	Fuel Poverty	116	We don't	Sometim	(You	So far I	No.	At first I	Yes							
16	Leeds	Phase A	Advisor - Doorknock	Long term	125	My main	From my	I took off		no. If they	Well the	Yes							
17	Leeds	Phase A	Advisor - in home	Fuel Poverty	140	Well it's	Just	For	No, not	No never.	I just	Yes	Yes						
18	Leeds	Phase A	Advisor - in home	Fuel Poverty	146	I'd like to	Well I	Not	No, not	No, this	I didn't	Yes	Yes						
19	Leeds	Phase A	Advisor - in home	Long term	155	I wasn't	I've not	Before I	Apart	No. (How	Saving	Yes		Yes					
20	Leeds	Phase A	Volunteer	Long term	161	Well I	I didn't.	Before,	The	No.	It	Yes							
21	Leeds	Phase A	Advisor - Doorknock	Fuel Poverty	170	I do try to	Just	Just	Not	No not	I think at	Yes							
22	Leeds	Phase A	Advisor - in home	Long term	173	Yes I	I didn't.	Nothing, if	I always	No. I	The	Yes	Yes	Yes					
23	Leeds	Phase A	Advisor - in home	Fuel Poverty	179	To be	To be fair	Well what	No. (What	No I	Because	Yes							
24	Leeds	Phase A	Advisor - in home	Long term	194	We do try	I didn't. I	No not	No not	No never.	It was the	Yes							
25	Leeds	Phase A	Advisor - Doorknock	Fuel Poverty	206	It is	I think it	Program	Not really	No, not in	The major	Yes	Yes						

Where additional evidential data was collected by Trial contractors/advisors, this has also been added to the framework grid. This includes:

- Information on the supply of ‘motivational’ products that aimed to prompt energy change behaviour fitted or provided during the Green Doctor Trial visits.
- Data on pledges made by evaluation participants during Green Doctor Trial visits, within the Hot Tips/Radiate Heat Trial and in the Energy Six Pack Trial.
- Email click through rates and online activity (web page visits) for the Energy Six Pack Trial.

The M-E-L Research Team met on a weekly basis to discuss the data and draw up outline/initial coding schemes and the principal lines of enquiry. Individual project team members then coded and labelled the qualitative data to enable content analysis. The M-E-L Research Team subsequently reconvened to review, refine and agree the coding schemes to assist with reporting.

The results of the content analysis are presented in the reports (see appendix). Raw data figures are used to indicate the prevalence of findings. Where relevant, findings are supported by anonymised verbatim comments made by evaluation participants.

### 2.3.4. Non-verbal indicators

It was anticipated that the face-to-face interview approach used for the Green Doctor and Kid Power Trials would also provide an opportunity to take account of non-verbal indications of changes in behaviour.

While this approach was intended to help identify any discrepancies between claimed behaviour and observations of the home environment, such as claimed use of energy saving light bulbs compared to visible evidence of their usage in the home, the data collected has proved to be incomplete and inconclusive.

In the Green Doctor Trial evaluation, the ‘pledge’ card was discussed with evaluation participants and M-E-L Researchers were asked to note whether the pledge card was visible.

The card read: 'Your Pledge Card - Simply tick as many pledges that you can. Then place this card where you'll see it all the time to remind you of simple ways to use less energy and still keep nice and cosy.'

However, visibility of the pledge card does not measure or indicate usage. The pledge card was also changed during the co-development phase of this Trial to 'My Action Plan'. This also changed how this resource was described by Advisors and how it was subsequently intended to be used.

### 2.3.5. Measuring outcomes

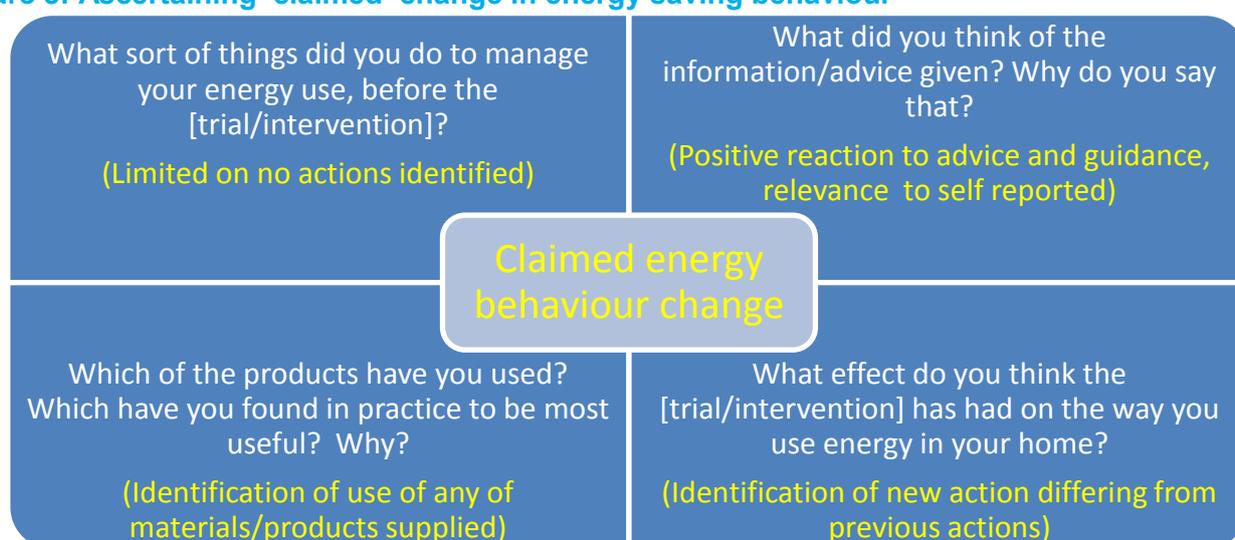
The following section describes the type of analyses conducted in order to ascertain specific outcome measures. It provides examples of the types of questions used to evidence increases in knowledge, relevance, importance and effectiveness. It does not, however, provide a definitive list of all the questions asked across all the Trials.

#### Ascertaining 'claimed' change in energy saving behaviour.

The measure of 'claimed' change in energy use behaviour has been attributed based upon evaluation of participants' claimed prior behaviour, subsequent views on the intervention, advice and guidance and any motivational devices supplied, and the reported effect on energy behaviour following the intervention.

For example in the Green Doctor Trial, where an evaluation participant indicated little or no prior energy saving actions, yet subsequently identified that the advice and guidance was useful, relevant and easy to undertake (relatively, depending on the evaluation participant), indicated some usage of any supplied products or materials and stated a different approach to that identified at the outset, then this has been associated with claimed behaviour change, as shown in the diagram below.

**Figure 5: Ascertaining 'claimed' change in energy saving behaviour**

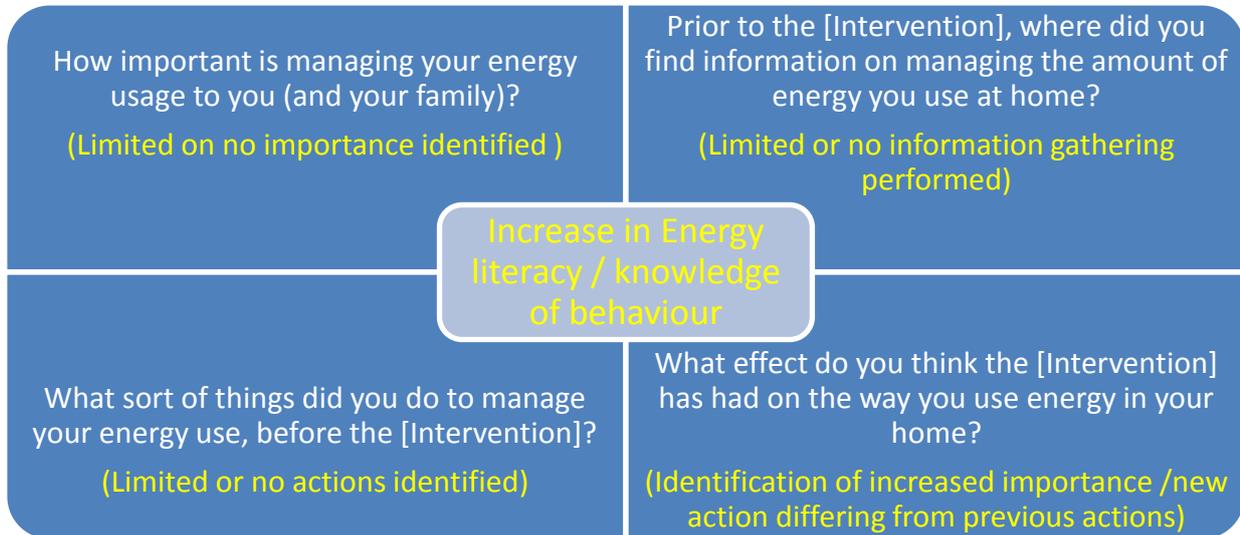


It should be noted that where an action was 'claimed' yet had also previously been undertaken, such as bleeding radiators in the previous 12 months in the Hot Tips / Radiate Heat Trial, then these actions were not attributed to the intervention as prompting behaviour change.

### Ascertaining 'Energy literacy and Knowledge of behaviour'

Levels of energy literacy and knowledge of behaviour have been established by comparing what an evaluation participant claimed they knew/did prior to an intervention with what they claimed they knew/did following the intervention.

**Figure 6: Ascertaining 'Energy literacy and Knowledge of behaviour'**



An example comment that demonstrates an increase in energy literacy and knowledge of behaviour is shown below.

*“Well I didn’t give it a lot of thought until they came round and that made me think more about what I was using and I turned the thermostat down a little bit and radiators off I didn’t need. It made me more aware of what I was using.”*

*Green Doctor London, In-home visit, Phase C, Long Term Health Condition*

### Ascertaining 'Self-efficacy'

Self-efficacy has been derived from an evaluation participant’s claimed change in behaviour compared to their claimed likelihood of making the change and the claimed relative ease or difficulty in making the change without participation in the intervention. An example comment that demonstrates this is shown below.

***How likely would you have been to make these changes anyway? Why do you say that? How easy would it be to make these changes anyway? Why do you say that?***

*“It would have been easy but you would have had to have that thought in the first place. What this has done is it has given me the consciousness and brought it to the front. I might have made some (changes) but I wouldn’t have made all the changes that we made. We didn’t think about saving energy and putting energy saving light bulbs in and turning off the heating when we’re not using it. We didn’t think like that. I might have decided to get energy saving light bulbs but I think that might have been it.”*

*Parent, Kid Power Test Group School*

## Ascertaining 'Saliency'

Saliency has been attributed where evaluation participants have provided positive comments regarding relevance, usefulness, ease of understanding and importance to the advice and guidance received, as shown in the example below.

### ***What did you think of the information/advice given?***

***"It was good information and advice. It wasn't new but because someone was telling me it... and I wasn't reading it... it makes you more aware. You listen more... I read things and forget about them after but they were here telling me about these things and it worked, it made me realise I was wasting energy. It's all common sense really... it just takes somebody to tell you about it for you to really take notice."***

*Community Peer Leeds, In-home visit, Phase A, Long Term Health Condition*

## Ascertaining 'benefits'

The key questions used to ascertain whether an evaluation participant claimed to have benefitted from the intervention were:

### *Kid Power Trial:*

***"What effect do you think having your child participate in the energy saving lessons has had on the way you use energy in your home?"***

***"What benefits have you seen due to the energy saving changes you have made?"***

***"Has the benefits increased your likelihood of continuing to do this energy saving measure?"***

### *Green Doctor Trial:*

***"What effect do you think the visit from the Green Doctor/Housing Association representative has had on the way you use energy in your home?"***

***"Do you intend to carry on with the tips to manage your energy use that the Green Doctor/Housing Association representative gave you? Why is that?"***

***"Has it prompted you to do other things to manage your energy use? Has it influenced the way that other people in your household use energy?"***

### *Energy Six-Pack Trial:*

***"What effect do you think using the energy six pack email scheme has had on the way you use energy in your home?"***

***"What benefits have you seen due to the energy saving changes you have made?"***

***"Has the benefits increased your likelihood of continuing to do this energy saving measure?"***

*Hot Tips / Radiate Heat*

***“Did you use this radiator key to bleed your radiators? What are the benefits of bleeding your radiators?”***

***“What effect do you think the energy saving information has had on the way you use energy in your home?”***

***“What benefits have you seen due to the energy saving changes you have made?”***

***“Has the benefits increased your likelihood of continuing to do this energy saving measure?”***

Other benefits identified by evaluation participants during the semi-structured interviews have also been noted, regardless of where in the interview these appeared.

### Ascertaining ‘Effectiveness’

Where comparative analysis between Trials and intervention strands has been undertaken, then ‘effectiveness’ has been measured by the proportion of those within a Trial and/or intervention strand that have claimed to have changed energy behaviour. The greater the proportion claiming to have made a change, the greater the effectiveness of the Trial/intervention strand.

## 2.4. Limitations

At the outset of the Trials a number of limitations were identified. There are a number of cross-cutting limitations that affect all Trials and other limitations that are specific to individual Trials.

### 2.4.1. Access to real-time information on energy usage

The Trials have not taken place with households who were on smart meters although some participants may have had access to in-home displays (IHD) devices.

- For the Hot Tips/Radiate Heat Trial, the type of prepayment meter in a tenants’ home was not known (i.e. prepayment meters with or without IHDs). Those with IHDs would have been able to monitor their energy use during the Trial more easily, which may have impacted on their motivation to continue the desired behaviour in the future.
- For the Kid Power Trial the two different intervention groups took place in different schools; pupils in one school received IHDs as well as a course of lessons; pupils in the other school only received the lessons. It is not possible to solely attribute differences in the different intervention groups to the nature of the intervention (presence or lack of IHD), as varying external factors may have influenced behaviour; the extent to which parents engaged with the school, the emphasis the school placed on homework, for example.

### 2.4.2. Accounting for the impact of seasonal differences in weather

The Trials were conducted in differing geographical locations, covering areas of southern and northern England. Some were undertaken in the lead up to Christmas 2013, while others spanned this period and continued until late February 2014. The propensity to change behaviour was likely to be different during differing periods of the year and the seasonal ambient temperatures. It was not possible to objectively review or quantify the effect that the difference in recruitment timings and/or season /weather conditions had on an individual’s propensity to adopt the energy saving behaviours.

- For the Green Doctor Trial, the majority of participants in Phase A had taken part in the intervention between November and December 2013, while the majority of participants in Phase C were visited mid-January to February 2014. Seasonal effects were likely to have confounded any observed differences between these Phases.

### 2.4.3. Risk of priming and/or recruitment/sample bias

- The Hot Tips/Radiate Heat Trial included a pre-intervention telephone survey with the same pool of tenants that were invited to participate in the Trial. Potentially, a tenant who completed the pre-intervention survey, and was then invited to take part in the Trial, might have been more likely (primed) to agree to participate, and then subsequently be more predisposed to undertake the new behaviours suggested by the intervention.
- Similarly, with a change to the Green Doctor Trial to partner with Housing Associations in both London and Leeds, we understand that some tenants received a pre-contact letter explaining that visits might take place, to help alleviate any safety or security concerns of tenants. Again, these tenants may have been more willing to participate as a result.
- The post-intervention research for the Kid Power Trial involved in-home interviews with the families of pupils who participated in the Trial. Families who were already interested in saving energy and in what their child had been learning in school may have been more likely to participate in the evaluation. Therefore, the provision of an incentive for taking part was designed to encourage participation from those parents who may have had less interest in saving energy, and for whom the intervention potentially may have had lesser impact.
- In the Kid Power Trial, the ability to interview a cross-section of families was dependent upon timely access to contact information, the interest of families to participate and the availability of family members during evenings and weekends.
- For the Energy Six Pack Trial, although emails inviting customers to participate were sent from the energy supplier, there was the potential for the sign-up emails and the energy quiz/support programme emails to have gone directly into a customer's junk mail/spam folder, thereby not reaching the potential participant at all.
- In the Energy Six Pack Trial, the energy suppliers' positioning was as a 'cheaper, greener, simpler' energy company; all its customer communication was done via email/online and its customer profile was biased towards professionals and managers. This bias towards higher socio-economic groups would need to be taken into account when considering the potential roll-out of this Trial for other socio-economic groups of customers of other energy suppliers.

### 2.4.4. External Influences on energy saving attitudes/behaviour

- For the Green Doctor Trial, both of the target audiences for this intervention (fuel poor / those living with long term health conditions) were likely to be priority audiences for energy companies, charities, healthcare organisations and government organisations, looking to help these groups manage their energy consumption effectively (e.g. the Keep Warm, Keep Well campaign<sup>14</sup>). Therefore, it was likely that they would have received other communication/contact around saving energy during the intervention period. Specific questions were included as part of the semi-structured interviews to help establish any external influences but it was not possible to control for the effect of other initiatives.

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<sup>14</sup> <https://www.gov.uk/government/publications/keep-warm-keep-well-leaflet-gives-advice-on-staying-healthy-in-cold-weather>

### 2.4.5. Over-claiming behaviour

As the Trials were not linked to the roll-out of smart meters, data was not available to establish actual energy usage. The methodology for the impact evaluation therefore relied instead on participants' self-reported claimed behaviour to assess the potential of the Trial to influence energy saving behaviour.

- While the Hot Tips intervention asked participants to fill out a pledge card, selecting behaviours to adopt over the coming 4 weeks, this pledge card was kept by the participant at home, and therefore it was not possible to independently verify whether respondents did actually fill out the pledge card, where/whether they kept it for the duration of the Trial, or which behaviours they pledged to adopt, beyond what they asserted during the semi-structured telephone interviews.

From other studies<sup>15</sup>, we know that there is often a significant difference between claimed and actual behaviour; respondents have a tendency to respond in a way which they know is socially acceptable. The evaluation cannot quantify the difference between claimed and actual behaviour.

### 2.4.6. Understanding the potential for sustained behaviour change

In order to understand how the Trials worked, we conducted post-intervention interviews roughly four weeks after the respondent participated in an intervention. This was necessary to ensure that the detail of the intervention was still fresh enough in the participants' minds to enable us to assess its impact and explore how the intervention was received by the participants. However, the minimum recommended time period for assessing whether sustained behaviour change has taken place would normally be at least 6 months, post-intervention. Therefore, judgements about reported sustained behaviour change are based on the respondents' stated intentions and motivation to continue with the newly adopted energy saving behaviour in the future.

## 2.5. Methodology used for the synthesis evaluation

The synthesis of the evidence generated through the Trials is based upon a comparative analysis of each Trial set against the six synthesis evaluation questions, and where data allowed, individual interventions within and across the Trials. Number counts of categories derived through post-interview content analysis have been used to indicate the relative prevalence of specific patterns of claimed behaviour.

Respondents' 'claimed' (self-reported) energy saving behaviours has been used to establish whether an intervention appeared to lead people to actively reduce or manage their energy consumption and whether there was a likelihood to continue to actively reduce or manage energy consumption in the long term, as a result of an intervention.

## 2.6. Limitations to the synthesis analyses

### 2.6.1. Differences in target audiences

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<sup>15</sup> Fisher, RJ, 1993 [Social desirability bias and the validity of indirect questioning](#), Journal of Consumer Research, 20: 303-315.

Nederhof, AJ, 1985 [Methods of coping with social desirability bias: a review](#), European Journal of Social Psychology, 15: 263-280.

It should be noted that each Trial was designed to target a specific audience, whether that be those with Long Term Conditions and the fuel poor (Green Doctor), those on pre-payment meters (Hot Tips/Radiate Heat), families (Kid Power) or high energy users (Energy Six Pack). It is therefore not possible to specifically compare Trials on a like for like basis. Instead, where possible, a comparative analysis of 'similar' approaches has been undertaken, e.g. a Community Peer approach taken in the Green Doctor and Hot Tips / Radiate Heat Trials.

### 2.6.2. Overall Trial and evaluation sub-sample (individual intervention strands) sizes

The Kid Power Trial evaluation, in particular, has suffered from low base sizes; just 5 out of 13 possible families from the control school are included in the evaluation. The Control Group school contact data only included child name, postcode and a contact telephone number; the names of parents or postal addresses were not supplied. In the Test Group school, 10 out of 27 possible families (only 27 correctly signed parental consent forms were received) have participated in a face to face post-intervention interview.

The Energy Six Pack Trial evaluation has a small sample base, with just 12 interviews conducted from the 26 participants that took the quiz and subsequently signed up to the Trial, and 20 interviews conducted from the 60 participants that signed up directly. Data supplied for the evaluation that identified 'test', 'do not contact' or was missing/had incorrect telephone data was excluded from the sample.

### 2.6.3. Organisational culture

The organisations that were contracted to undertake each of the trials vary considerably in their structure, reach (regional or national) and age. Every organisation has its own 'culture' - its personality or style of doing things. The differing experience and reach of each organisation is likely to have had an impact on how the Trials and interventions have been delivered.

The following information has been edited and summarised from each organisations' website to demonstrate the differences in ethos and approach:

**Energy Six Pack Trial:** *"The Centre for Sustainable Energy (CSE) is an independent national charitable company. CSE came into being in 1979, though in those days we were called the Urban Centre for Appropriate Technology (UCAT). We began as a sister organisation to the widely known and well-respected Centre for Alternative Technology, and have always been based in Bristol where we are putting down strong roots in the community.*

*CSE helps people and organisations from the public, private and voluntary sectors meet the twin challenges of rising energy costs and climate change.*

*Our vision is a world where sustainability is second nature, carbon emissions have been cut to safe levels and fuel poverty has been replaced by energy justice.*

*Our mission is to share our knowledge and practical experience to empower people to change the way they think and act about energy.*

*We do this by giving advice, managing innovative energy projects, training others to act, and undertaking research and policy analysis.*

*We are based in Bristol although much of our work has relevance and impact across the UK. Our clients and funders include national, regional and local government and associated agencies, energy companies and charitable sources. We are also a founder member of the charity-owned joint venture, Energy Advice South West Ltd."*

**Green Doctor Trial:** *“Groundwork (UK) was set up in 1982 as a ‘radical experiment to bring together communities, businesses and government in a joint effort to improve the quality of life and promote sustainable development in places that had become run-down and neglected’. We want to see a society of sustainable communities which are vibrant, healthy and safe, which respect the local and global environment and where individuals and enterprise prosper.*

*Creating these sustainable communities means developing initiatives which cut across economic, social and environmental issues. Our work is diverse, but it all helps to achieve our vision. The Groundwork approach is to start local, put the right tools in people’s hands, engage with everyone who has a stake in a place and address as many issues as possible with the same investment.*

*National reach, local action: Groundwork operates across the UK.”*

**Kid Power and Big Ask Trials:** *“Community Energy Direct (CED) is a non-profit support organisation for local volunteer-led groups (Energy Smart Clubs) to help households within the community to resolve energy issues. In December 2012 CED was awarded funding by the Department of Energy and Climate Change (DECC) which enabled the kick-start of the Energy Smart Club model. The CED programme is based on a tried and tested grassroots engagement model which seeks to support and empower local community champions.*

*We help our volunteers (Energy Smart Champions) to set up their own local knowledge hub (Energy Smart Club) for anyone who wants help to find out about energy and how to use their home in a more energy efficient manner.*

*CED is based and principally operates in the North East of England, covering Bradford, Kirklees, Leeds, Rochdale, Wakefield and York.”*

**Hot Tips / Radiate Heat Trial:** *“Global Action Plan (GAP) is a national charity that brings people together and inspires them to take practical environmental action. We work out the impact of their actions and share their stories so more people are inspired to change.*

*Working with businesses, schools and communities, we provide behaviour change programmes that help people live more sustainably. Since 1993, our award-winning partnerships have helped 750,000 people make practical changes for the environment. Through our events and communications, we’ve influenced a further 4 million people.*

*Our programmes are the UK’s only environmental behaviour change projects endorsed by the United Nations Environment Programme (UNEP).”*

#### **2.6.4. Limitations in the evaluation data available**

It should be noted that the Kid Power and Green Doctor Trials rely solely on qualitative data to answer some of the nine research questions. Due to a lack of quantitative data to help triangulate findings, the data is therefore limited; we are not able to draw conclusions around the impact of an intervention. Instead, inferred findings are used, based on the judgement of the authors.

# Technical Appendix 2

## Example materials used in the Trials

Material used in Hot Tips and Radiate Heat Trial  
 '8 hot tips for winter' leaflet

**HOT TIPS FOR WINTER**

Rising energy bills are in the news, so here are 8 simple tips to help you save money on electricity and gas this winter.

**We're asking residents to choose 3 to try, which could save up to £10 a month**

We've given you a fun magnet to put on your fridge and help you remember your tips.

We've also included a window sticker so you can remind neighbours to do their bit too.

You can save more than just energy. Turn over to find out about other benefits.

**WE'RE SAVING ENERGY THIS WINTER, ARE YOU?**

endorsed by **Bolton at Home**

We've teamed up with environmental charity Global Action Plan who've provided these tips. These are typical figures and some people may save more.

**8 tips to help save money on electricity and gas**

Tick box 'A' if you already do this and box 'B' if you'll try it this winter.

**TICK 3 TIPS**

- I'll switch electrical items off at the wall and not leave them on standby. Can save £3 a month and also reduces fire risk.
- I'll bleed my radiators to remove air. Can save £17 over the winter. Use the key in this pack.
- I'll only boil the water I need\*. Can save £1 a month and you'll get your tea more quickly.
- I'll switch lights off when they're not needed. Can save £1.50 a month.
- I'll wash my clothes at 30° for everyday washing. 30° is kinder to clothes. Can save £10 a year.
- I'll switch my TV off when I'm not watching it. Can save £7 a year and make the TV last longer.
- I'll spend 3 minutes less in the shower. Shorter showers can save £2 a month.
- I'll switch my computer and monitor off when I've finished with them. Can save £8 a year.

\*Just make sure to leave enough water in the kettle to cover the element.

## Bleed your radiator information tag

**How to... bleed your radiators**

For warmer homes and more efficient radiators

- Before you start make sure your central heating system is turned off, and the radiators are cool.
- You will need your radiator key, attached to this card, and a bowl or old towel.
- With your radiator key handy, locate the bleed valve. You should find this at the end of the radiator near the top.

- Have the bowl or towel ready to catch any drips. Insert the radiator key into the bleed valve and turn it about half a turn anticlockwise, you should hear a hissing sound which is the air escaping.
- Once water begins to leak out, close the valve by turning it clockwise.
- Repeat this with all other radiators in your home. Success – you're done!

Please see our YouTube channel [www.youtube.com/boltonathome](http://www.youtube.com/boltonathome) for help on your heating system or for repairs phone 01204 338200.

Bleed your radiator information sheet

**Use your radiator key to bleed your radiators**

## Did you know...

Air in your radiators means they don't heat your home as well as they could, and cost more to run. It's simple to fix with the right tool, so we've sent you a radiator key to bleed any air from your radiators. It will only take a few minutes.

- Save some money on your pre-pay meter
- Get rid of cold spots and noisy pipes
- Help make your heating system work better

**Use your radiator key to bleed your radiators**

We're sending these packs to lots of other residents. You can put the sticker in this pack on a front window to remind neighbours to bleed their radiators too.

**Bolton at Home**

**WE'RE SAVING ENERGY THIS WINTER, ARE YOU?**

We've teamed up with environmental charity Global Action Plan who've provided these tips.

8 hot tips for winter magnet

**HOT TIPS FOR WINTER**

## To save energy this winter I'll:

- Switch off properly at the wall
- Bleed my radiators
- Boil only what I need
- Only light rooms with people in
- Love my clothes and wash at 30°
- Not leave the TV talking to an empty room
- Spend 3 minutes less in the shower
- Log off then switch off

Circle the actions you're going to do and stick this to your fridge as a reminder

'Peer' ask letter

**Hello,**

My name is \_\_\_\_\_ and I live on the Highcroft Estate Blackburn, but am also a Twin Valley Homes Tenant Board Member and am actively involved in the community where I live.

I am writing to you to share a few helpful energy saving actions that you can do to save a tenner or two off your energy costs this winter.

Winter is a difficult time for many households, trying to keep warm without spending all your money on your gas and electricity can be a real challenge. But, the good news is that there are lots of ways that we can all save energy every day, without making big changes to our daily lives.

This energy gift pack has a few ideas of simple ways you can save energy and make your home warmer and cheaper to run.

*We've given you a few suggestions to get you started and help you save energy this winter.*

*We've also included a number of ideas on how you can help us to do this too.*

You're probably doing some of them already, which is great, and there might be a few that you've not tried yet. I'd like to encourage you to have a look through the list.

You can tick off those that you already do, as well as note down some new ones to try.

**See mine**

Personally, I have reduced the time I spend in the shower, only boil just enough water in the kettle to make a cuppa, turn off appliances and don't leave them on standby and turn off the lights when I leave a room.

I'm looking forward to seeing the colourful stickers popping up in house and car windows this week!

Hundreds of your Twin Valley Homes neighbours are taking part and saving energy and money this winter so please do get involved and spread the word to help others start saving too.

**Tenant Board Member**

Material used in Green Doctor Trial

Phase A 'Pledge' card / Phase C 'Action plan'

## Your pledge card

Simply tick as many pledges as you can. Then place this card where you'll see it all the time to remind you of simple ways to use less energy and still keep nice and cosy.

### Do it once

**I will:**

- Turn my heating thermostat down by one degree
- Use a thermometer to keep my home at 18-21 degrees.
- Turn down my radiator thermostats by one notch.
- Adjust my heating to come on only when I need it.
- Adjust my hot water so it only heats to 60-65 degrees.

### Day to day

**I will:**

- Only use my dishwasher or washing machine when they're full.
- Take showers rather than baths, and use a timer to limit myself to four minutes.
- Turn off appliances at the mains rather than leaving them on standby.
- Close the curtains when it gets dark.
- Put lids on saucepans when I'm cooking.
- Only fill the kettle with the amount of water I need.
- Leave food to cool before putting it in the fridge or freezer.
- Turn off the lights when I leave a room.



## My Action Plan

Carry out as many actions as you can. Put this card where you can easily see it to remind you of simple ways to use less energy and still keep warm and cosy.

### Day to day

**I will:**

- Only use my washing machine or dishwasher when they're full
- Take showers rather than baths, and use a timer to limit myself to a few minutes
- Turn off appliances at the socket rather than leaving them on standby
- Hang my clothes to dry rather than use a tumble dryer

- Put lids on saucepans when I'm cooking
- Only fill the kettle with the amount of water I need
- Leave food to cool before putting it in the fridge or freezer
- Turn off the lights and heaters when I leave a room
- Always switch taps off
- Close the curtains when it gets dark



8 page 'advice and guidance' leaflet

# Keep your home warm & cosy



AND WASTE LESS ENERGY - AND MONEY

## Wasted energy is wasted money

With winter approaching, it's a good time to take a look at how much energy you're using - and possibly wasting. Grab yourself a cuppa and spend a few minutes finding out more. Then turn to pages 6-8 for some quick and easy ways to start cutting down right away.

### Keeping warm and well

If you're watching the pennies, being more energy efficient around the home means that you can be more comfortable without having to cut down on other things.

And it can be better for your health and wellbeing too. By keeping your home cosy, you'll help to keep colds and flu at bay, and you may find it easier to manage some medical conditions.



## Know more to save more

**It's very easy to take energy for granted. We just switch things on but usually don't think about how much energy they use.**

By finding out a bit more about how you use energy around the home, and how much you get through, you can start to waste less. It will also help you to get more value from the money you do spend on your gas and electricity bills.

**Did you know** that an energy monitor is a simple way to keep track of exactly how much electricity you use?



Think about a typical day for a moment. Having your heating and lights on, making meals and hot drinks, watching TV or using a computer, taking a bath, and having the washing machine rumbling away in the background - together, they use a lot of energy.

Find out more from USwitch  
[www.uswitch.com/energy-saving/guides/energy-monitors](http://www.uswitch.com/energy-saving/guides/energy-monitors)

## What uses the most energy?

Do you know the main users of electricity in the average home, and what they cost to run? Some are obvious, but one or two may surprise you.

Heat and light	Food and drink	Wash and dry
Standard 100W light bulb (£14/year)	Fridge freezer (30p/day)	Washing machine (50p/wash)
Electric heater (30p/hour)	Electric oven (3p/week)	Dishwasher (15p-45p/load)
Iron (10p-20p/hour)	Kettle (2.5p per boil)	Tumble dryer (50p/hour)
		Hair dryer (30p/hour)

Most of us couldn't do without many of our power-hungry electrical appliances, but there are still plenty of ways to use them more efficiently.

For some top tips to get you started, turn to our energy-saving checklist on pages 6-8.

## Small changes, big difference

There are lots of things you can do to make your home cosier and more energy efficient.

You could consider using draught excluders and reflectors behind your radiators, or lagging your hot water tank. And as over half of your home's heat is lost through the roof and walls, you may want to put in loft or cavity wall insulation.

Learn more from the Energy Saving Trust [www.energysavingtrust.org.uk/insulation](http://www.energysavingtrust.org.uk/insulation)

**Did you know** that you may be able to get a grant from the government, your local authority or your energy supplier to pay for energy-efficiency improvements to your home?

Find out more at [www.energysavingtrust.org.uk/Take-action/Find-a-grant](http://www.energysavingtrust.org.uk/Take-action/Find-a-grant)

## It's easy to be cosy

But you can also start to use – and waste – a lot less energy today, for free, just by making a few simple changes to what you do every day.

- Read the checklist on the following pages for some simple, cost-free ways to use energy more efficiently.
- Tick the things you can do on your pledge card and stick it where you'll see it all the time – maybe on a noticeboard or your fridge?
- Keep looking at your pledges to remind yourself how you can use less energy.

**Your energy-saving checklist**

Even the simplest changes to your everyday habits can make a big difference to the amount of energy you use at home.

Here are a few easy ways to get you started. You can do some of them right away and they won't cost you a penny.

## Things you can do today

Turn your heating thermostat down by one degree and use a thermometer to check your home stays around 18-21 degrees.

If you have them, turn down individual radiator thermostats by one notch.

Adjust your heating and hot water timer so that they only come on when you need them.

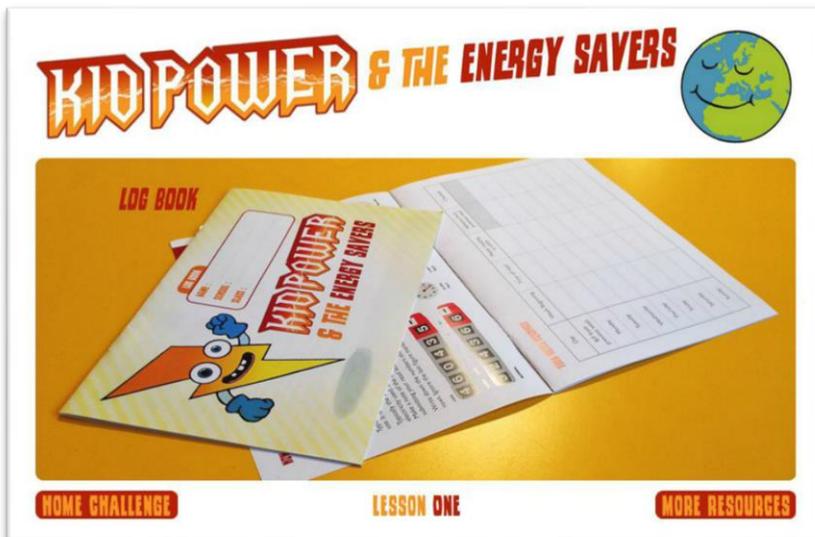
Adjust your hot water so it only heats to 60-65 degrees.

## Things you can do every day

- Only use dishwashers and washing machines when they're full.
- Take showers rather than baths if you can, and use a timer to limit yourself to four minutes.
- Turn off electrical appliances at the mains rather than leaving them on standby.
- Close the curtains when it gets dark, tucking them behind radiators to keep the heat in.
- Put lids on saucepans when cooking and don't fill the kettle with more water than you need.
- Leave food to cool before putting it in the fridge or freezer.
- Turn off the lights when you leave a room, even if it's for a minute.

Material used in Kid Power Trial

Example of visual aids, showing 'Kid Power' Cartoon character, energy log book and evil standby



Other example Kid Power classroom materials and completed log book

**KIDPOWER # THE ENERGY SAVERS** WORKSHEET

**USING PIE CHARTS TO DISPLAY DATA**

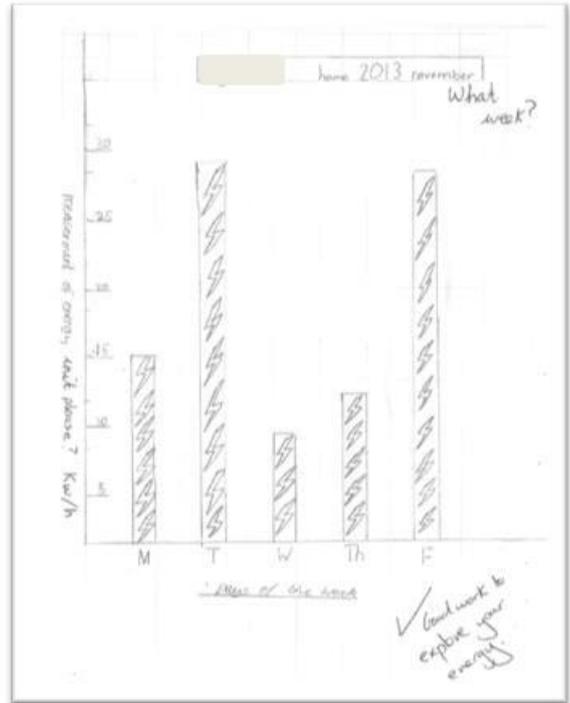
**EXAMPLE**

**Energy Sources UK** ESTIMATE PERCENTAGES!

**MATCH COLOUR TO USE!**

**FINAL ENERGY CONSUMPTION by SECTOR** SUGGEST CATEGORIES - YEARS!

I can check results and ensure that solutions are reasonable in the context of the problem.  
 I can interpret tables, lists and charts used in everyday life  
 I also know that.....



**KIDPOWER # THE ENERGY SAVERS** WORKSHEET

**HOW MUCH DO MY LIGHTS COST?**

Type of light	Cost per hour	Where is it?	How long is it left on for every day?	Total cost for these lights.
Conventional Incandescent bulb				
Total cost for these lights in my house on one day:				
Compact Fluorescent Lamp				
Total cost for these lights in my house in one day:				
Strip Light				
Total cost for these lights in my house in one day:				

I can interpret tables & charts  
 I can use appropriate calculation skills to solve problems  
 I know that I can change how much energy is used in my house

Total cost of one day's lighting in my house \_\_\_\_\_  
 Total cost of one week's lighting in my house \_\_\_\_\_  
 Total cost of one year's lighting in my house \_\_\_\_\_

Name ..... Date .....

**YOUR METER READINGS**

Day	Week Beginning	Time of read	Meter reading in kWh	Advance four previous read	Checked
Bill from previous week	17.11.13				
Monday		15:46	59876	10kwh	
Tuesday		15:49	59878	8kwh	
Wednesday		15:45	59885	7kwh	
Thursday		15:45	59892	7kwh	
Friday		15:45	59904	12kwh	
Saturday		14:00	59911	7kwh	
Sunday		8:00	59918	7kwh	

**YOUR METER READINGS**

Day	Week Beginning	Time of read	Meter reading in kWh	Advance four previous read	Checked
Bill from previous week	18.11.13				
Monday		15:45	59933	15kwh	
Tuesday		8:00	59939	6kwh	
Wednesday		15:55	59948	9kwh	
Thursday		16:00	59957	9kwh	
Friday		15:45	59964	7kwh	
Saturday		7:40	59974	10kwh	
Sunday		12:50	59985	11kwh	

Material used in Energy Six-Pack

Example of Energy Six-Pack web portal

# Energy Six-Pack



## Your six-week energy saving workout

**Week one: Keep the heat in**

Here are this week's energy saving actions. You can see what everyone else has decided to do. What will you take action on this week?

Have a read, tick some boxes and press **submit**.

And don't miss the resources at the bottom.

**34%** of people say they'll do this

**61%** of people say they'll do this

**59%** of people say they'll do this

I'll fill the cracks

▶ Suggestions please ...

I'll fix the floors

▼ Yes, but how?

If you have uncarpeted floors, get some rugs for the cold weather as a layer of insulation. If you like your wooden floor you can move them in the spring!

Fill the gaps between your floorboards to keep out the draughts. You can buy DIY plastic strips for this – information below.

I'll do something about my windows

▶ But what?

“Bring it on”



**Submit**

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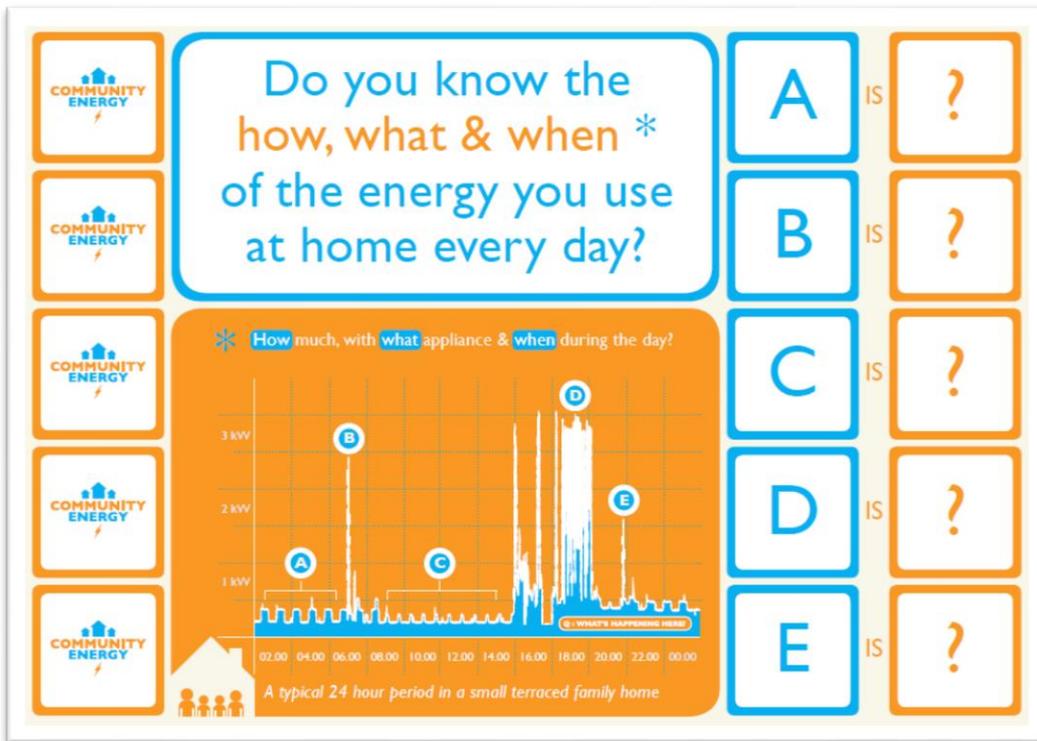
**Resources**

[How to do some DIY draught-proofing](#)

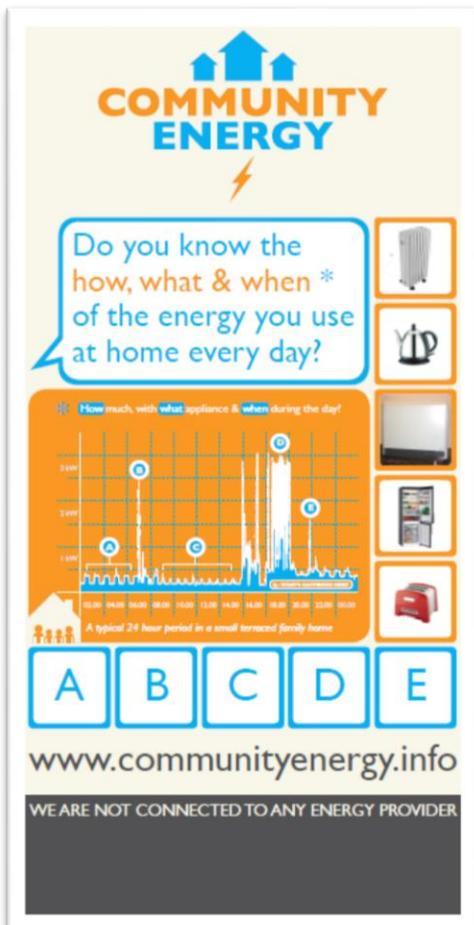
[Make a draught-proofing snake](#)

Material used in Big Ask Trial

Board Game used at recruitment events



Display stand used at recruitment events



Materials that were not used due to Trial being cancelled  
Energy log book



Name		
Address		
What is your main type of heating system?		
Gas boiler	Combi boiler	How old?
	Boiler with hot water cylinder	How old?
Electric	Storage heaters	How many?
	Under-floor electric heating	
Please complete the details above, circling options where applicable		
What other heating do you use (please circle)		
Wood Burning Stove	Electric Radiant Heater	Electric Oil Radiator
Electric Wall Radiator	Electric Fan Heater	Gas Fire

### YOUR HEAT LOG

DAY & DATE	IS YOUR MAIN HEATING SET ON A TIMER?	DO YOU TURN HEATING ON & OFF AS REQUIRED?	WHAT HEATERS DID YOU USE TODAY?	ENERGY CHALLENGE
Week One 00/01/2011-07/01/2011	What hours is it set for?	What hours did you use today?	What additional heaters did you have on & for how long?	Did you reduce your heating by one hour today?
Monday				YES / NO Which hour?
Tuesday				YES / NO Which hour?
Wednesday				YES / NO Which hour?
Thursday				YES / NO Which hour?
Friday				YES / NO Which hour?
Saturday				YES / NO Which hour?
Sunday				YES / NO Which hour?

### ABOUT THERMOSTATS

**Thermostatic radiator valve**

- Turn up or down to adjust the flow of hot water to the radiator
- If you don't really use a room, keep this on a low temperature
- Keep it low in bedrooms, then turn up an hour before you go to bed

**Digital Thermostat**

- This can be used to set the times and temperatures on your boiler
- An internet-connected thermostat also allows people to remotely control home heating

**Dial Thermostat**

- If you have one of these you may not be able to set a timer for the heating, unless the boiler can be directly programmed

Typically, only about 10% of people who have a programmable thermostat actually create a schedule

**TURN DOWN ONE DEGREE = 10% SAVING**

Home energy saving leaflet

To save money and create a warmer, healthier home, follow these handy energy saving tips:

**Kitchen**

- Only boil the water you need in your kettle. **Save 68\***
- Always try to put a full load in the washing machine, plus wash at lower temperatures like 30°C.
- Don't leave the fridge/freezer door open for long and defrost regularly.
- Remember to turn appliances off when not in use. **Save between £50 and £50\***

**Bathroom**

- Have a shower rather than a bath – it uses 5 times less hot water.
- Towel dry your hair to cut down on time with the hair dryer.
- Fix leaking taps.

**Loft**

- Try setting your hot water cylinder thermostat no higher than 60°C.
- Make sure your hot water cylinder has a thick jacket on and the pipes are lagged. **Save £20\***
- Get your loft insulated to 270mm (10.5") deep. **Save £175\***

**Outside**

- Dry clothes outside whenever possible. **Save 255\***
- Stop draughts by using sealants, brushes and rubber strips around doors and windows.
- Most heat is lost through walls. Install cavity wall insulation. **Save £140\***
- If your walls are solid, these can be insulated too. **Save £490\***

**General tips**

- Programme your boiler to turn on when you are home
- Close curtains at dusk
- Use radiator valves to control the heat in each room.
- Try turning your room thermostat down by one degree. Leave it for a day and if you still feel warm enough, try turning it down another degree until it feels a bit too cool and then turn it back up one degree.
- Buy energy efficient appliances and light bulbs.
- Keep extra blankets by your bed.

**Every degree that you turn it down could save you around £30**

\*Savings calculated by the Energy Saving Trust and are approximates and dependent on individual circumstances. Most are estimated as savings per year visit [www.energysavingtrust.org.uk/take-action](http://www.energysavingtrust.org.uk/take-action)

This guide will help you save money through saving energy in your home. It will also help you create a warm and cosy home.

If you are over 80, or have a disability, or have a long term illness, or have a child under 5, it is particularly important that you have a warm home. If you need help because your home is too cold due to lack of insulation or no/inefficient heating, you'll find advice from the following organisations:

**Yorkshire Energy Partnership**  
Provides advice and support with the cost of installing energy saving improvements. Tel: 01904 545 020 [www.yorkshireenergypartnership.org.uk](http://www.yorkshireenergypartnership.org.uk)

**Citizens Advice Bureau and Age UK**  
Offers information and advice on keeping warm and staying healthy in your home. Tel: 08444 111 444. [www.yorkcab.org.uk](http://www.yorkcab.org.uk)

**Age UK**  
Tel: 0800 169 6565 / 01904 627965. [www.ageuk.org.uk](http://www.ageuk.org.uk)

**City of York Council**  
visit [www.york.gov.uk](http://www.york.gov.uk) and search for 'climate change!'.  
The council also offers a range of housing support services.  
Please visit: [www.york.gov.uk/info/200171/housing](http://www.york.gov.uk/info/200171/housing) or contact the council on 01904 551550

**Save £165\*** Double glaze your windows

**Get paid for the energy you generate**

**Save £490\*** Generate your own free electricity or hot water

**Save £140\*** Install cavity wall insulation

**Save £175\*** Insulate your loft

**Save £20\*** Lag your pipes

**Save £140\*** Insulate your loft

On certain suitable properties, an alternative to cavity wall insulation is to install solid wall insulation to the exterior of the house.

**Save £140\*** Install cavity wall insulation

If you would like this information in an accessible format (for example in large print, on CD, by email or in another language) please contact us:

**01904 551550**

This information can be provided in your own language.  
我們也用你們的語言提供這個信息 (Cantonese)  
Ta informacja moze być dostarczona w swoim własnym języku (Polish)  
Bu bilgileri kendi dilinizde almanız mümkündür. (Turkish)

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