

Smart Metering Advice Project (SMAP)

Evaluation Report – Energy Saving Trust

March 2013

1. Background

Smart meters are the next generation of utility meters, and under the UK smart meter roll-out gas and electricity meters will be offered to every home in England, Wales and Scotland by 2019 and to all homes in Northern Ireland by 2020.

Over the course of 2011/12 and 2012/13 the Energy Saving Trust, with funding from the Northern Periphery Programme (NPP) and from the Scottish Government, developed and delivered the Smart Metering Advice Project (SMAP). This project was part of the wider [OCTES](#) project, and aimed to:

- **Develop the tools and personalised advice provided by the Energy Saving Trust so that it can take best advantage of smart meter data to provide householders with advice to deliver energy related behaviour change.**
- **Explore the extent to which these enhanced energy saving advice services, linked to smart meter data, can deliver local and national carbon and energy saving, and protect vulnerable people from fuel poverty.**

In total 33 households (16 heated electrically, 11 heated by gas, and 6 heated by oil), in Dumfries and Galloway and the Highlands and Islands¹ had smart metering equipment installed in their homes. Smart meters for oil will not form part of the national smart meter roll out. However, oil is a widely used heating fuel in rural Scotland – indeed heating oil is used to heat around one third of rural homes in Scotland. The SMAP project therefore developed a smart metering advice solution that would cover electricity, gas and oil heated homes. Oil is a comparatively expensive fuel and it is important that this group of householders are not shut out from the most effective energy saving advice.

Project participants were given access to the data from their smart metering equipment via a new web tool (which was developed as part of this project), and were also given access to specialist, tailored energy saving advice and support from their local Energy Saving Scotland advice centre (ESSac).

The project began towards the end of the 2011/12 financial year and ran until March 2013.

It proved considerably harder and required considerably more resource than originally envisaged to recruit householders to take part in the project primarily because of lower than expected responses to mail-outs and other invitations to take part. As a result the recruitment process took longer than originally envisaged. This, together with some teething technical problems associated with data transfer meant that householders only had access to the SMAP online tool for a relatively short period of time before the project was evaluated. The timescales associated with key project activities were as follows:

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¹ The Northern Periphery Programme (NPP), through which this project was part-funded, covers two areas of Scotland – 1) Dumfries and Galloway and 2) Highlands and Islands, and as such these were the areas where the recruitment of householders to take part in SMAP was undertaken.

- Recruitment of participants began in June 2012, and continued until December 2012,
- Metering equipment was installed in all participating properties between 8th October 2012 and 16th January 2013.
- Each of the householders was given access to the SMAP web tool to allow them to each monitor their household energy usage from 29th January 2013.

2. Evaluation

The evaluation of the SMAP project involved three surveys – two surveys with participants and one with householders who had been invited to take part in the project but had chosen not to.

The first survey (survey 1) was conducted prior to participants' 'active' participation in the project (i.e. before they had access to the web tool and before they were provided with any advice related to their metered energy usage) and was conducted over the phone or by post. The aim of this survey was to gauge respondents' expectations of the project and to understand their current behaviour towards energy saving.

The second survey (survey 2) was conducted at the end of February 2013 via an online survey. The aim of this survey was to understand how the project met their expectations and the extent to which it has made them think further about, and take actions in relation to, their energy use.

The evaluation also involved a survey (survey 3) of those who had been invited to take part in the project but had chosen not to. This part of the evaluation was commissioned as a direct result of difficulties experienced in recruiting householders to take part in the project, and it was felt that this could provide useful lessons for future smart metering programmes, and indeed the wider smart metering roll-out. This survey was conducted in early March 2013.

The following sections present the findings of these three surveys.

Survey one

All 33 participants completed a questionnaire prior to their 'active' participation in the project. A number of background questions were asked to get an understanding of the type of people participating in the project:

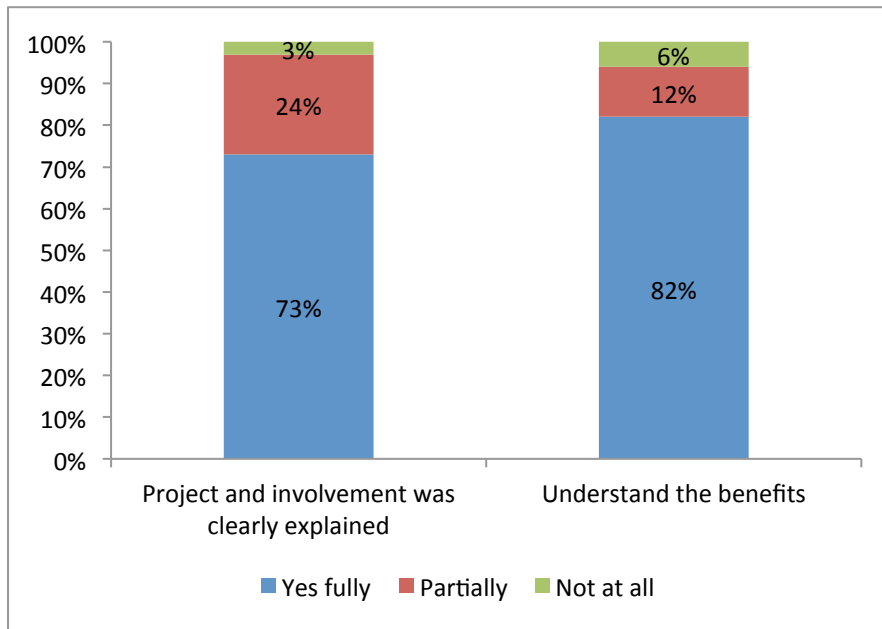
- The majority of households had someone that was usually at home during week days (79%), during week nights (94%) and at weekends (94%)
- 45% of participants are retired
- 88% of participants owned their houses²

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Participants were asked whether they felt that the project had been clearly explained to them and whether they understood the potential benefits of having smart metering equipment installed:

² It is worthwhile noting that the intention was that all participants would be owner occupiers. Administrative errors meant that 4 people living in rented properties ended up taking part in the project.

Figure 1: Understanding of the project

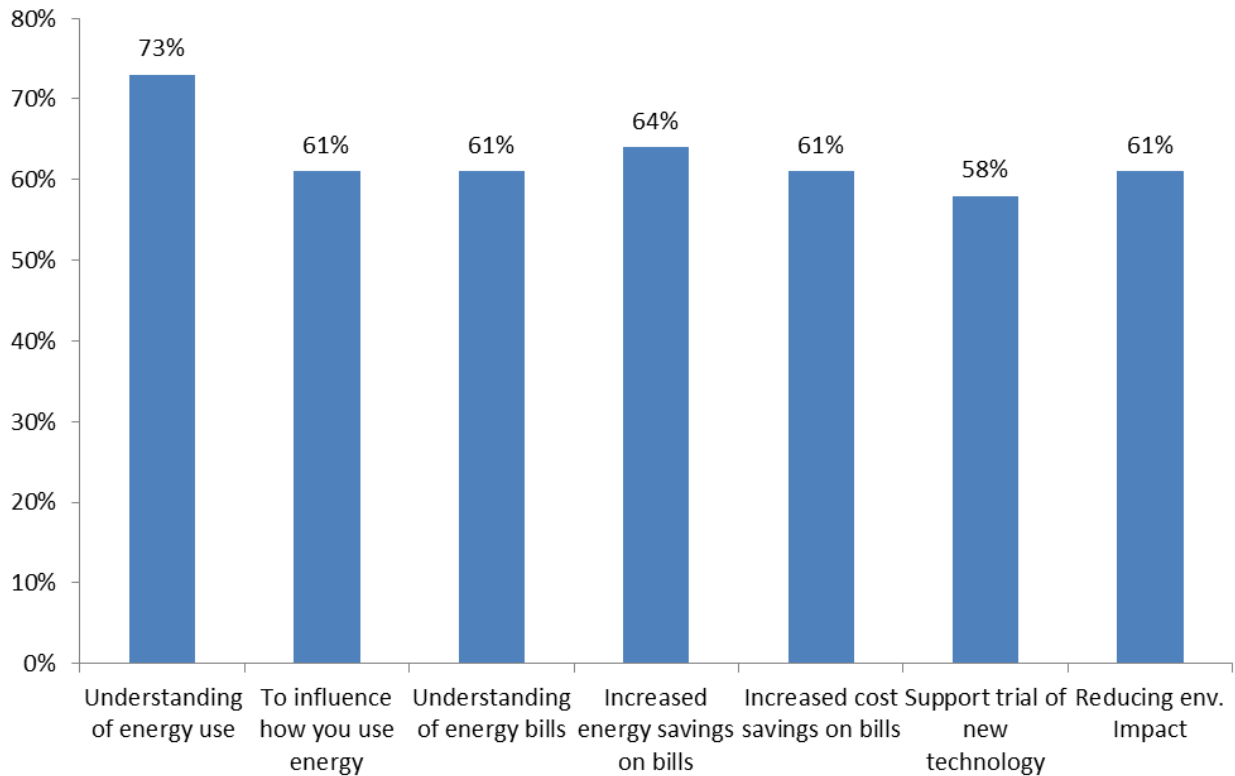


The majority of participants felt that the project had been clearly explained to them and they felt that they understood the potential benefits of having smart metering equipment installed.

94% of participants were feeling positive about having smart metering equipment installed in their homes. The remaining 6% (two respondents) were feeling indifferent about the installations.

Participants were asked what their expectations were of being involved in the project. Figure 2 shows their responses:

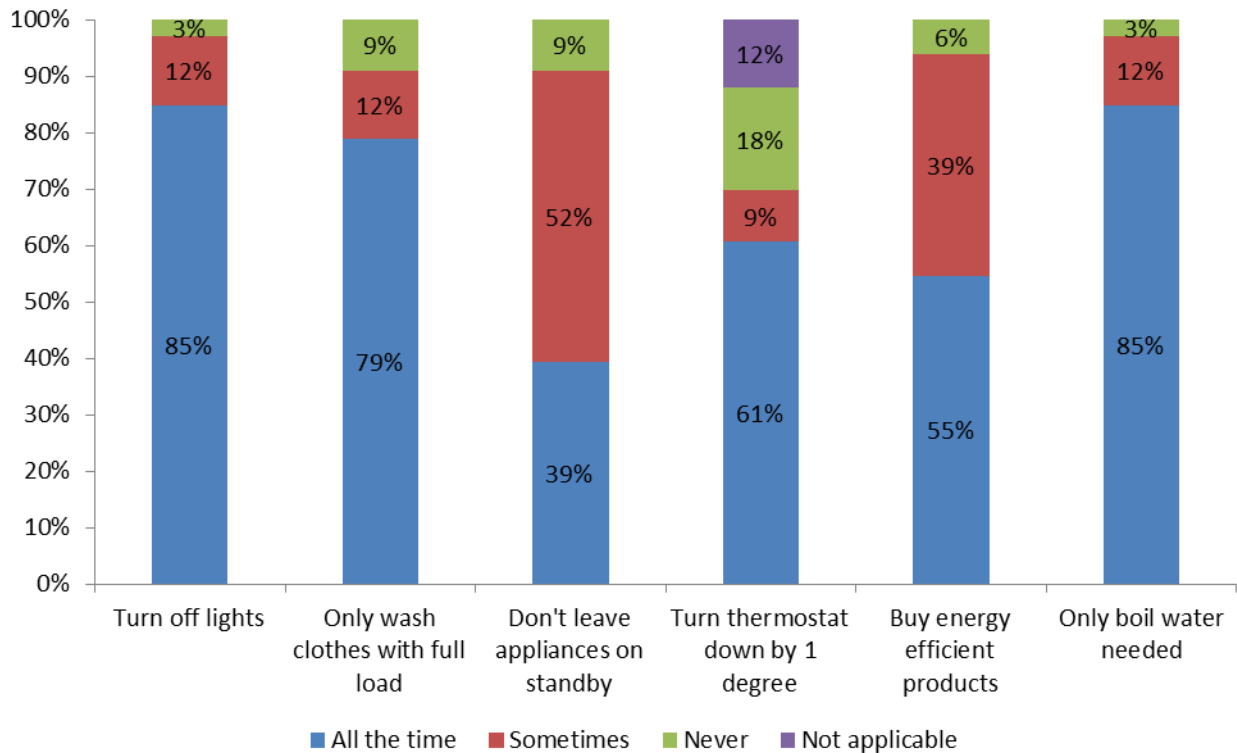
Figure 2: Expectations of the project



The majority of participants had multiple expectations from being involved in the project with the most common expectation being that their involvement would result in an increased understanding of the amount of energy they use.

Participants were asked whether they currently performed any of the following energy efficiency behaviours:

Figure 3: Current energy efficient behaviour



The majority of householders already perform the majority of behaviours all of the time, and while some behaviours are never performed by some householders - this only represents a relatively small percentage of householders for each behaviour considered. The most common behaviours that participants are already performing are turning off the lights in unused rooms and only boiling as much water as needed.

Survey two

20 out of the 33 SMAP participants responded to the online survey – a response rate of 61%.

15 of the respondents (75%) felt positive towards smart metering systems now they were living with one, one felt negative towards them whilst the others were unsure as they didn't feel they had been using it for long enough to make an informed decision. Those that felt positive mentioned the following:

"For the first time I was able to see how I was using energy and become aware of how I might economise."

"It's nice to know information is being gathered. The equipment just sits on the wall [and] doesn't bother me."

"If the system contributes to better understanding of energy usage, then I'm for it."

"Discovered night usage of oil, so we reset timer now saving fuel".

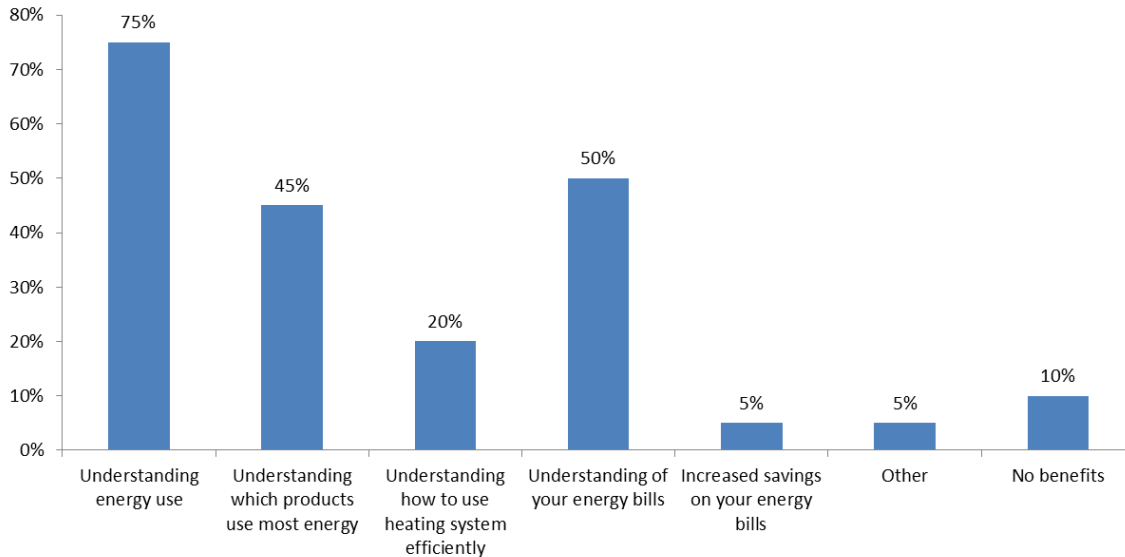
The one householder that expressed negative views had had some difficulties with getting the correct readings from the web tool.

Respondents were asked whether they had seen any of the following benefits as a result of having the smart metering system and access to the web tool:

- Increased understanding in the energy you use/consume in your home
- A better understanding of what products in your home use the most energy
- A better understanding of how to use your heating system efficiently
- Increased understanding of your energy bills
- Increased savings on your energy bills
- Other benefits
- No benefits

18 respondents (90%) felt that they had seen at least one of these benefits so far. The following chart shows the percentage that reported seeing each benefit:

Figure 4: Benefits of the smart metering system and web tool

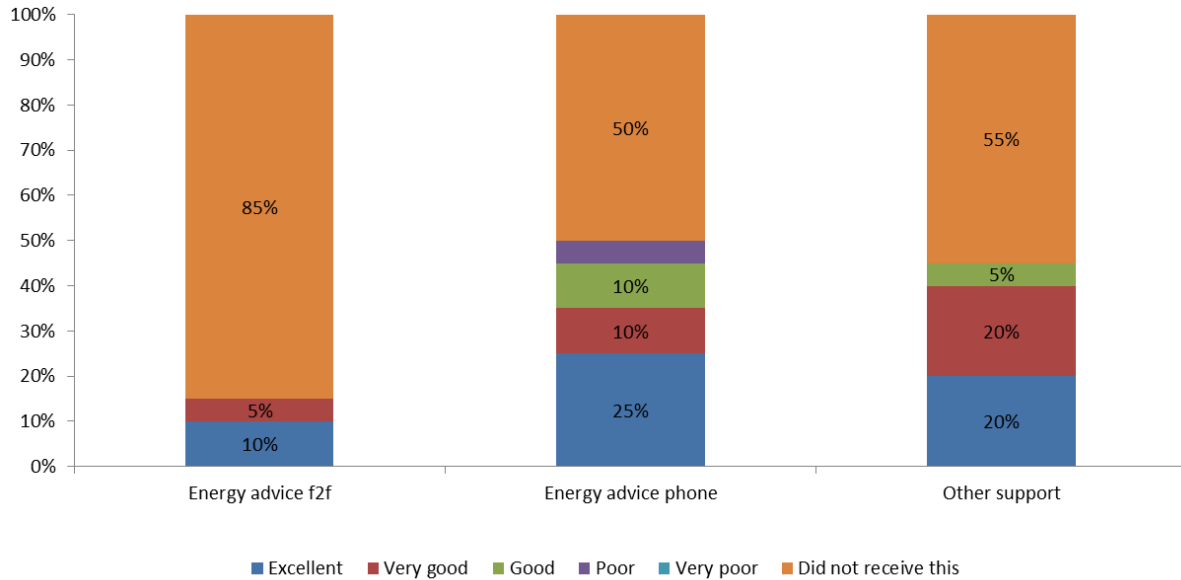


As can be seen in figure 4 an increased understanding of their energy use was the main benefit that respondents reported seeing, together with an increased understanding of their energy bills and an increased understanding of which products use the most energy.

14 respondents (70%) felt that they have now been able to track their energy use better than before the smart metering system was installed and they had access to the web tool.

All 33 participants received two telephone calls from an advisor; and 3 of these participants also received one home visit and a third phone call. Respondents were asked if they recalled receiving energy advice from an advisor face to face, over the phone or other advice and support in conjunction with receiving the smart metering system and web tool. Figure 5 shows the percentage of respondents that recalled receiving these different levels of support and the extent to which they rated the support provided.

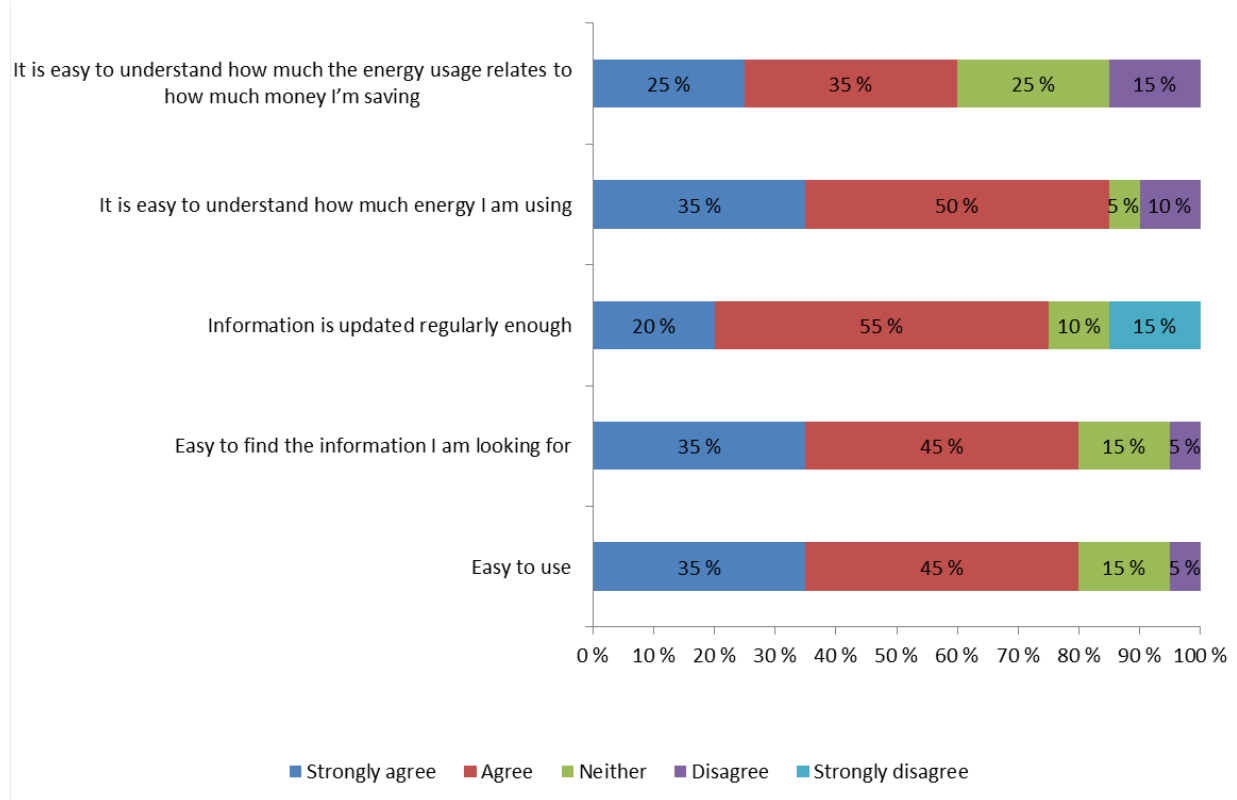
Figure 5: Advice and support received



Three respondents (15%) received face to face advice and all three recalled being given this advice, and felt that it had been excellent or very good. Only 10 respondents (50%) recalled receiving advice over the phone. This could be because participants considered that the phone call focussed on how they were getting on with using the web tool and whether they were experiencing any problems with it as opposed to providing specific pieces of energy efficiency advice. All but one of the respondents that did recall phone advice had found the advice good, very good or excellent. Where the respondent had found the advice poor this was where the web tool was not providing correct data and this was yet to be rectified. In terms of other support, most referred to the support they had been given by the advice centre on how the web tool works or the information from the installer of the smart metering equipment on how to operate the system.

Respondents were asked to rate satisfaction with the web tool:

Figure 6: Satisfaction with the web tool



The majority of respondents were happy with the web tool and felt that it is easy to understand how much energy they are using (85%), that it is easy to use (80%) and that it is easy to find the information they are looking for (80%). One respondent disagreed with all the statements and commented that *"it doesn't give me current usage up to the minute, it's a bit awkward to navigate, I can't see electricity and oil usage side by side, and it's not always clear what's going on"*.

Only six people mentioned they had problems understanding the information presented in the web tool and six had had technical problems using the web tool.

Comments from respondents that had trouble understanding the information included:

"I don't know what the effect will be of interacting with "change my behaviour plan" and "change my energy savings plan"

"Some of the behaviour suggestions I do already".

"On the energy savings plan it says to insulate the hot water tank but it is insulated already. I assumed this was known but was not enough for today's standards."

"I can't work out what the 'background usage' relates to and it doesn't seem to make sense. We have an oil-burning Rayburn which is permanently on yet the readings don't seem to show any oil consumption which there should be. Sometimes there are background readings for oil and electricity and sometimes there aren't."

"Trying to change the calendar from day to day. It does not work very well."

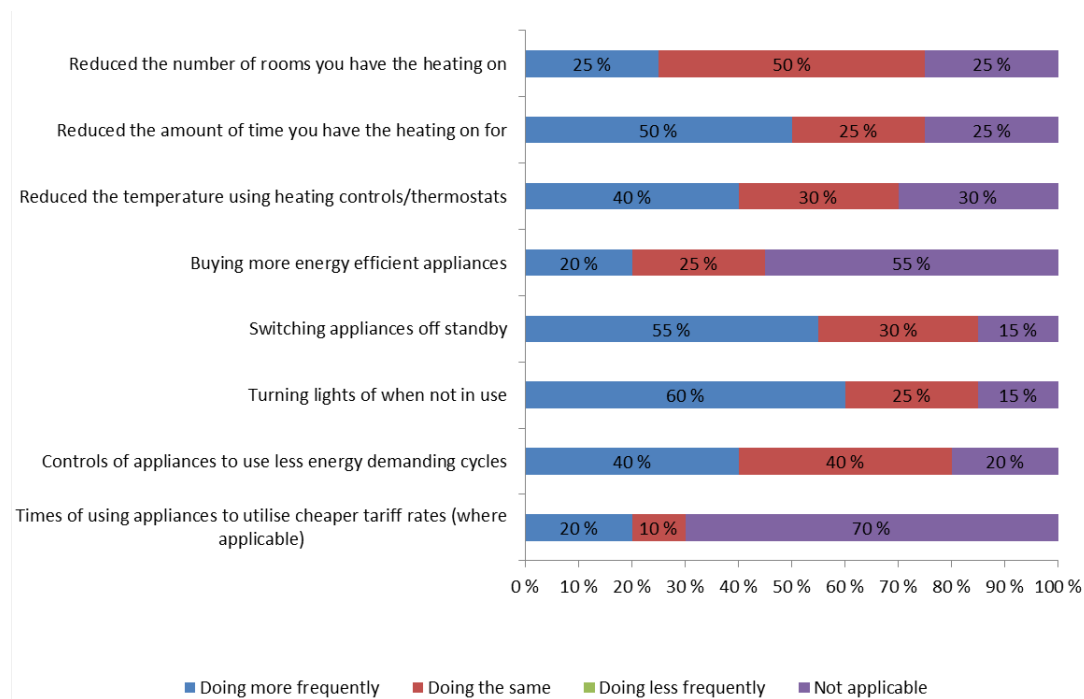
"One big error in the system leaves me uncertain about which collective figures are affected."

Where respondents reported technical problems this was mainly around not being able to log in properly or other teething problems at the start which have now been resolved.

14 respondents stated they would recommend installing smart metering equipment and using the web tool to a friend or relative with only one actively saying they wouldn't recommend it.

Respondents were asked if they had changed any behaviour in their home towards energy use as a result of having the metering equipment installed and access to the web tool. Figure 7 highlights the changes reported.

Figure 7: Behaviour change

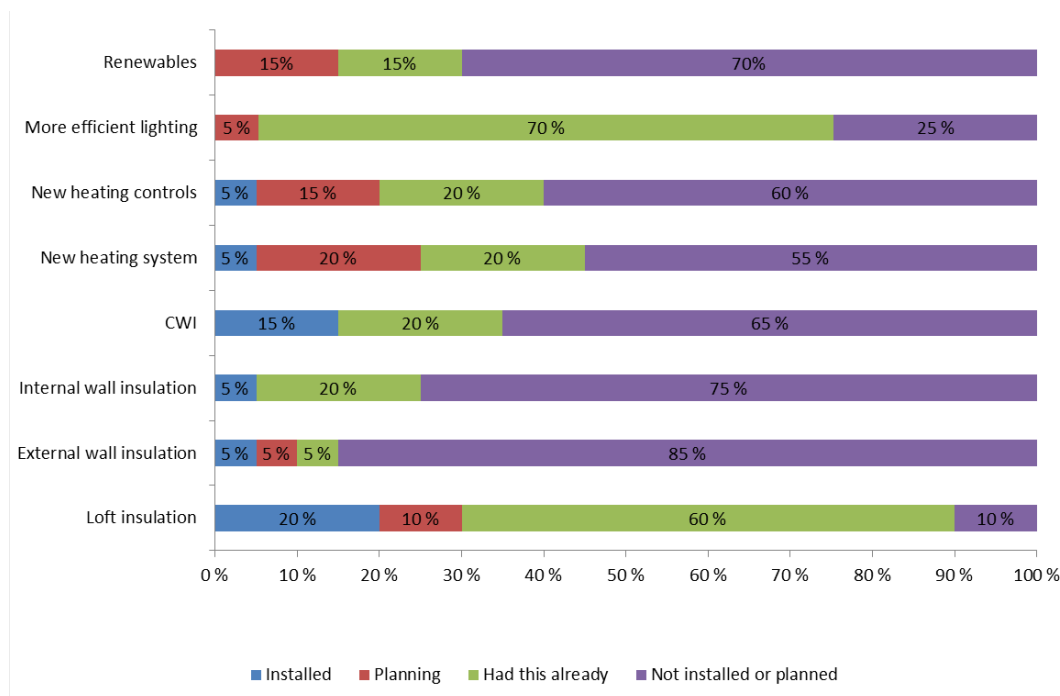


The main behaviours that respondents reported undertaking more frequently are turning the lights off when not in use (60%), switching appliances off standby (55%) and reducing the amount of time they have the heating on for (50%).

We note that the results presented in figure 7 do not appear to be completely consistent with those presented in figure 3. For example, figure 3 shows that only 27% of householders are not turning the thermostat down all the time, while the results presented in figure 7 suggest that 40% have increased the frequency with which they undertake this behaviour. This is likely to be a reflection of people’s natural tendency to over-claim positive behaviours.

Respondents were also asked whether they had installed, or were planning on installing any measures as a result of being involved in the project. Figure 8 shows the results of this:

Figure 8: Measures installed or planned as a result of being involved in the project



When considering the responses to this question it is important to highlight that respondents had only had access to the web tool for a few weeks before they responded to the survey.

Five respondents mentioned that they had installed measures as a result of being involved in the project. However, given the timescales it is likely that these were actually measures that they had already agreed to have installed and the project only highlighted that this was a beneficial thing to be doing. Because of this and the inconsistencies with people’s reported behavioural changes it is suggested that further evaluation work is conducted when participants have had more time to use the information and for us to

get a fuller understanding of how the project may have impacted on any changes made.

Finally, respondents were asked whether there was anything that could have been done to improve the process, equipment or web tool. Most respondents did not have any comments and could not suggest any improvements:

“Not that I could say.”

“The equipment posed no problems, except the technician came to change something regarding the heating oil tank.”

“No problems really.”

“So far I could not suggest any improvements.”

“Quite happy with system - cannot really comment on equipment but it seems to work ok.”

“The process what very efficient, the tool is interesting and provides useful information. I would say it does what it says on the tin.”

“Installation was painless, minimal involvement or disruption. Will be interesting to see how the tool is able to address seasonality issues.”

Where people did have suggestions they mentioned the following:

“Yes, by explaining things to me further.”

“Something to allow you to read the smart meter directly would help.”

“Yes, it would be of far more use to any one if capable of telling you the previous 24 hour readings whilst what was used and when it is still fresh in the memory.”

“We have two check meters, one for the domestic tariff and the other for the heating tariff which includes the immersion heaters and electric shower. To be able to monitor the use of the heating tariff is what I was hoping for.”

We will review opportunities for addressing these comments over the course of 2013/14.

Survey 3

A small study was conducted to understand why householders that were sent the letters inviting them to participate in the project did not want to be involved.

70 households were interviewed, and asked a set of questions which can be found in Annex 8. 53 of these households could not recall receiving a letter or phone call. Many of these mentioned that they get a lot of mail about loft insulation and energy efficiency and so it may have just got caught up with all the other mail and therefore they didn't register receiving it. However, given that they would have received these letters in June 2012, and this survey was undertaken in early March 2013, it is not necessarily surprising that people may have forgotten about receiving them. Some of these householders provided additional information that may provide some understanding of why they wouldn't have taken part or why they couldn't remember.

The results of this survey are therefore split by the two categories of respondents:

- a) Householders that did not recall receiving a letter or phone call, and
- b) Householders that did recall receiving a letter or phone call

a) Householders that did not recall receiving a letter or phone call

As noted above some of the householders that did not recall receiving a letter or phone call about the project provided additional information that may provide some insight into why they wouldn't have taken part or why they couldn't remember.

These generally fell into four categories:

- **They do not have access to the internet**

"I had thought about getting one [a smart metering system] but we do not have the internet to see what we are using, I'm not very up to date - I don't even have a mobile phone. I think the only way I would get one is if I didn't need the internet for it but it would still work to keep a record of what I was using".

"Well we wouldn't have been able to do it anyway because we are not on the internet; we have not learned to use the computer because me and my wife are both over 70 now".

- **They already had been provided with an in-home display** (respondents generally mentioned being provided with smart meters but it is more likely that these are in home display units)

"But I do already have a smart meter. It was sent to me in the post, I'm not sure who it was sent by, but I haven't used it because I don't know how to fit it up, it was not installed by anyone just sent in the post."

"Well I did not install the smart meter [one they received through the post] because it seemed a bit complicated to set up really and in any case the most of our energy consumption comes from oil and we only spend about £80-£90 on the electricity per quarter."

I think we possibly might have had it installed if it could have been done for free but it just came in the post and we didn't have a letter about it before."

- **They lived in a rented property**

"Well I am in a rented property so I don't have any control over the meters anyway".

- **Having previous experience of it not being possible to install**

"On the an additional property (not our residential home) we are refurbishing we did look into getting smart meters fitted, again we did not have a letter for that but it was something we looked into for updating the gas and electric meters. It turned out we could not get it for the electric meter because we could not get a signal and we could not get one for the gas because the meter was not old enough for it to be changed. For my own home address I haven't thought of it as something that relates to me really. I think that's more because I don't fully understand what it is that smart meters do."

b) Householders that did recall receiving a letter or phone call

For the 17 householders that did recall hearing about the project, nine recalled receiving the letter, five recalled receiving a phone call and three recalled a letter and a call.

Ten said that they weren't interested in the project, mainly for four reasons:

- **They do not use very much energy and so didn't feel it was needed**

"We are spending so little on the electricity that the meter would not have saved us any money whatsoever"

"I live in a small 1 bedroom flat and so don't use much energy which meant it would not have helped me save money having a meter put in."

- **They had already installed measures to reduce energy efficiency**

"We have had solar power panels and loft insulation installed which far out-weighed the saving that a meter appliance could help with and so we didn't see any point in getting it done"

- **They did not have internet connection so wouldn't be able to take part**

"We have no signal for the internet so it was pointless to have the meter fitted."

"I am not online so I would not have been able to use it and I am also in rented property so I wouldn't have been able to have it. Also, because I keep track of my own energy use anyway, I take a meter reading every week to see how much I so I didn't see that it would add anything else to that."

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- **They do not own their house**

"I did read the letter but I live in a council house so I would not have been able to have one."

Seven said that they did give some consideration to the project but that they decided against it. The main reasons given were:

- **They just didn't get round to it**
"I can't remember off hand why we decided not to take part in the service, I think we did give it some thought but it might have just been one of those things that we never got round to because we were busy and it wasn't something we necessarily needed."
- **Technical issues**
"I did go in to have one fitted but unfortunately due to a technical issue the item was never fitted to my meter, I'm not really sure what that issue was."

"I live in a remotely located property so it might not have worked and also it was not worthwhile as I don't think it would save any money."
- **Decided it was too complicated**
"After finding out a bit more, it looked a bit too complicated and too much of a bother."

Most respondents said that there wasn't anything more that could have been done to encourage them to take part. They felt the barriers they encountered (e.g. not having internet access) and those listed above could not realistically have been overcome:

- *"No, not at all because it was more about me deciding if it was worth it to save money but it wouldn't have done."*
- *"No nothing at all because the decision was made on whether it would save us money not any other incentives they could have given."*
- *No I don't think so, it was more that I lost sight of it and that I didn't follow it through. I have been trying to make my house more energy efficient such as insulating the roof and things. Maybe if someone sent me another letter or followed up with another call and then I might have remembered to do something about it."*

One respondent felt that the information could have been simplified:

- *"The literature should be more simplified as it is easy to misunderstand what is being conveyed. There was far too much technical information which I did not understand."*

4. Conclusions and recommendations

Due to the relatively short period of time that the householders had access to the SMAP online tool our conclusions at this stage are indicative rather than conclusive. However, the evaluation results do show that most householders valued the SMAP service and advice, and some have reported an increase in the frequency with which they perform specific energy saving behaviours as a result of being involved in the project.

Most importantly the research demonstrates the technical viability of integrating live metering data with the Energy Saving Trusts' existing programme of national government-funded energy saving advice. The majority of users reported finding the new service helpful and the pilot project therefore points the way towards the future of Energy Saving advice in Scotland.

As we move towards electricity and gas smart meter roll out the project shows how the new meters can be effectively linked to advice on behaviour change and home improvements – showing householders directly how much money can be saved, based on their real usage data.

Though oil meters are not being rolled out nationally, the project also highlights the value of smart oil metering and advice. A policy recommendation from this project is that the Scottish Government should investigate how the benefits of smart metering can be provided for oil customers.

As part of the incentive to take part in the project householders were advised that they would have access to the web tool for 2 years. Significant potential therefore exists to continue to make use of this data as it comes in to better understand the impact that the enhanced energy saving advice services linked to smart meter data can deliver carbon and energy saving and protect vulnerable people from fuel poverty. It would therefore be helpful to:

- Continue to provide advice and support (via the ESSacs) to householders involved in the project.
- Evaluate the longer term impacts of households having access to the web tool and associated advice.
- Explore the impact of regular 'prompts' (e.g. by e-mail) to households reminding them to check the tool and act on relevant advice.

Feedback from householders identified a number of improvements could be made to the web tool, and the potential to make these improvements should be further explored. Specifically, suggested improvements include:

- Making modifications to the web tool (and the way data is communicated from the metering equipment) to allow householders with two electricity meters (one for heating and hot water, the other for electricity use) to view the consumption of each meter separately on the web tool. It is worthwhile noting that the existence of two electricity meters in Scottish households is not uncommon.

- Improving the web tool's interface to ensure it is as easy to use and intuitive as possible.

It is worthwhile noting that some suggested improvements (e.g. related to frequency of data transfer to the web tool) were made during the project as result of dealing with 'teething' problems with the web tool.

Given the interest shown in being involved in this project by households with small scale renewables systems already installed, and the growing numbers of such systems in Scotland, it would be sensible to:

- Explore the potential to develop the web tool to allow it to take account of renewables systems installed in homes.

It is also worthwhile commenting on the results of the study to understand people's reasons for not getting involved in the project. Recruitment proved considerably more difficult and more time consuming than originally envisaged and because of this the project team had some concerns that people's reluctance to take part may have been due to some underlying resistance to having smart metering equipment installed. However, this appears not to have been the case. The results of the study suggest that householder's were not necessarily reluctant to take part, but just did not see getting this equipment installed as a high priority, or felt that their particular circumstances precluded them from taking part. In the context of the wider roll out of smart meters this is perhaps reassuring. This is an important finding: householders do not appear to be resistant to smart metering (for example because of data protection concerns) but they may need persuading that they should prioritise getting a meter fitted and using the data it provides to help them save energy.

Finally, it is also important to emphasise that it is too early to draw any robust conclusions from the metering data collected under this project. However, one householder's data together with their responses to the evaluation questionnaires provides some interesting insight into the impacts that access to smart metering data can have. This householder claimed, as a result of the having access to oil consumption data (via the web tool), to have "discovered night usage of oil" and had since "reset the [heating control] timer [to now] save fuel". Analysis of the householder's oil usage data showed that there had been a significant reduction in average weekly oil usage from 772 kWh / wk to 442 kWh / wk, equivalent to a 42% reduction.