

## SWELL Project Round 2 interviews.

### Report for SWELL meeting on 7<sup>th</sup> October 2016.

Jo Hamilton, 6<sup>th</sup> October 2016.

Responses were received from thirty-nine participants in total. Twenty-five<sup>1</sup> completed the survey online, and telephone interviews were conducted with fourteen participants. The remaining participants were either contacted multiple times, or had arranged an interview towards the end of September, but were not able to make the time arranged.

The responses have been organised according to the questions in the survey. Where the questions have more discursive answers and quotes, a summary is provided in red, with further detail and quotes provided beneath it.

#### 1. Overall experiences of participating in the SWELL project: (n=39)

The responses were positive overall, with participants stating that their experience ranged from very positive and interesting to something they didn't really notice. The main responses to the open ended question have been grouped thematically below. Seventeen participants were positive about the project, fourteen found it interesting, and nine were happy with their involvement.

In summary, participants appreciated the aims behind the project, the feedback they received about their own energy consumption, financial recompense, and the interactions with all the SWELL team. For those who were less interested in it they were happy to participate and not have it interfere with their daily lives.

#### **Positive (17)**

Seventeen respondents mentioned that they found the project either very positive (2), or a positive / good experience (15). Those who were very positive (2) mentioned their own experiences, alongside the community aspect of being part of something larger, for example:

*'It's been exciting to think we're part of a project that could, and now is, developing into something that could be spread further and be beneficial in terms of energy reduction and making it easy to create energy and reduce the amount of energy overall that's needed.'* [#302].

Some were very positive despite some ongoing problems with the technology:

*'Excellent. Great feedback and feeling of belonging to something. Programming Hestia Smart plug to repeat a charge overnight has been mega frustrating - I cannot be that dense and it must be the software surely?'* [# 318].

Respondents were positive about the overall project, for example: *'That it is a well-run project with admirable aims. There has been plenty of information available for participants'* [#308]; alongside the financial recompense which was mentioned by three respondents: *'Good, especially the money*

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<sup>1</sup> Note: one participant responded for both her house and the Sports Pavilion, this is counted as one response, as it was submitted together, but distinctions between the house and Pavilion have been made where necessary.

*that I've been getting and all my savings, the coop vouchers, It's quite painless, just me doing things at different times of the day. Obviously easier in the summer than the winter.'* [#354].

Five respondents appreciated the feedback from the SWELL team, for example: *'It has been good to put some numbers to something which until now has been hard to grasp'* [#304]; and *'The feedback from the team has been very good, from Sarah and so forth they're very involving'* [#337].

### **Interesting (14)**

Fourteen respondents mentioned that they found their involvement was interesting. This ranged from those with storage heaters, for example: *'It's quite interesting actually, but things haven't changed very much, because the heating, it's the heating that I'd be used to, so nothings really changed, but it's very interesting being able to pick it up on the iPad and watch the progress'* [#309].

Some participants have reported small changes of their electricity usage, for example: *'We have found the project very interesting and worthwhile although we have only managed to make marginal changes to our energy use.'* [#317]; and *'It has been thought provoking and informative. I don't feel I have achieved a lot, but maybe these things take time'* [#304].

Others have appreciated the combination of the team who have installed the equipment, and the continued feedback: *'The people who installed everything were really helpful & knowledgeable. The regular monthly reports help keep us focussed on what we can do to improve our timings on usage.'* [#338].

Other participants have appreciated the feedback but not modified their patterns of electricity usage, for example: *'Interesting to see our pattern of electrical energy use, which we have not had to modify in any significant way since joining the trial'* [#360].

Again, teething problems with the equipment have been noted in the responses, such as: *'Moderate, great concept however the technology has failed 3 times with connectivity issues. Dash board has improved visibility'* [#362].

### **Fine (9)**

Other respondents were mainly complimentary about their participation. This has included four respondents for whom the project has had low impact, for example: *'Low impact to be fair on us, because I think what we contribute is generating solar power for you to play with, so that's pretty much what we can do. It's rare for us to be at home during the day'* [#306]; and for those who thought the project sounded interesting, but did not want to get too involved: *'I thought as it doesn't cost me anything, I thought I would participate. And that's it'* [#365]; and for those who had already adjusted their consumption to their Economy 7 electricity tariff: *'we have economy 7 which we've had for a very long time. Where possible we've got used to running things like tumble drier in a cheaper energy period.'* [#322].

## **Equipment**

### **2. Satisfaction with the equipment (n=39)**

Thirty participants were either very satisfied or satisfied with the equipment in their home, and ten were neither satisfied nor dissatisfied. No-one was dissatisfied with the equipment overall.

**Twenty-nine participants were very satisfied (15) or satisfied (15).** One participant qualified their response with *'Very satisfied, because I hardly notice it.'* [#342], mentioning that the equipment was either working well *'Fine. Satisfied. It's very passive'* [#337], or it has had some problems, but was mainly working well *'OK after a couple of blips'* [#311].

**Ten participants were 'Neither satisfied nor dissatisfied'.** Of these, there were more mentions of problems with connectivity *'Connectivity failed 3 times. Aesthetically not very subtle'* [#362]; or getting online to view the Hestia Hub, for example: *'I am not computer literate, and this thing requires me to log in and I can't do that.'* [#313]. This indicates that there is room for improvement for those who do not use computers, alongside

No-one was dissatisfied with the equipment overall, problems with connectivity and the equipment have been dealt with and resolved promptly.

### 3. Particular likes / dislikes about the equipment: (n=33)

Of the thirty-three respondents to this question, sixteen mentioned that they had no particular likes or dislikes. For some this was because the equipment was working well, and was out of sight. In this question, respondents have tended to focus on what they didn't like about the equipment, and suggested improvements.

The dislikes that were reported varied. Some were suggestions for improvements, some considered loss of connectivity more as teething problems and to be expected in a trial, whilst for others some of the dislikes seemed a little more aggravating. However, when compared with the answers from question 2, none of these participants were *dissatisfied* with the equipment overall, thus we could take the more specific dislikes from the participants as being an opportunity to suggest improvements.

- *'The Hestia unit is located out of Wi-Fi contact and has required additional mains-powered equipment to send the information to our server unit. I don't like it because it sits there using electricity'* [#336].
- The fan on the battery *'Fan on battery quite noisy. Quite a lot of damage to wall during installation.'* [#311].
- Remembering the password for the Hestia Hub online information was problematic for one participant: *'but password far too complicated'* [#334].
- Some mentioned problems with connectivity, for example: *'Vulnerable when there's a power outage or broadband interrupted (but better recently'* [#320]; whilst for another participant the size was less positive: *'It's a bit big & obvious! It does make a background noise'* [#338].
- Some would like to be able to interpret the data and best times for using electricity more easily: *'Almost what you want is something a little more intrusive, something that shows you a green light when you're using the energy at the right time, and a red light when you're using it at the wrong time.'* [#342], and *'Like it generally, but it would be great to have the sort of smart meter that gives real time data for energy usage'* [#320].
- Two respondents mentioned the difficulty of interpreting the MASLOW units, for example: *'Difficult for the layperson to understand the indicator lights and symbols on the Maslow'*. [#40]; and *'Maslow symbols and flashing lights difficult to interpret.'* [#320].
- The smart plug programming was a strong dislike for some, for example: *'The smart plug programming sucks!'* [#41]

#### 4. Difficulties with equipment:

We asked 'Have you experienced any difficulties with the equipment (for example with the controls)?' (n=36). Nineteen participants hadn't experienced difficulties with the equipment, and seventeen respondents had experience difficulties.

Thirteen of these involved faults on the equipment or software, or overall loss of connectivity of the Hestia unit to the Wi-Fi signal to send the data. These have tended to be easily solved, and in the responses there isn't a sense of any lasting annoyance at the loss of connectivity, for example: 'Several equipment faults, both at home and sports pavilion, sorted out via visits from SWELL team.' [#311].

Two participants have experienced difficulties with the Smart plug programming, one had difficulties interpreting the MASLOW controls. Both of these issues have been raised in the answers to previous questions. One had difficulty viewing the Hestia Hub on their tablet,

All respondents were asked if they wanted follow up from the SWELL team on any reported difficulties, which have been passed on.

### Learning and understanding

#### 5. Looking at Hestia Hub (online interface) (n=37)

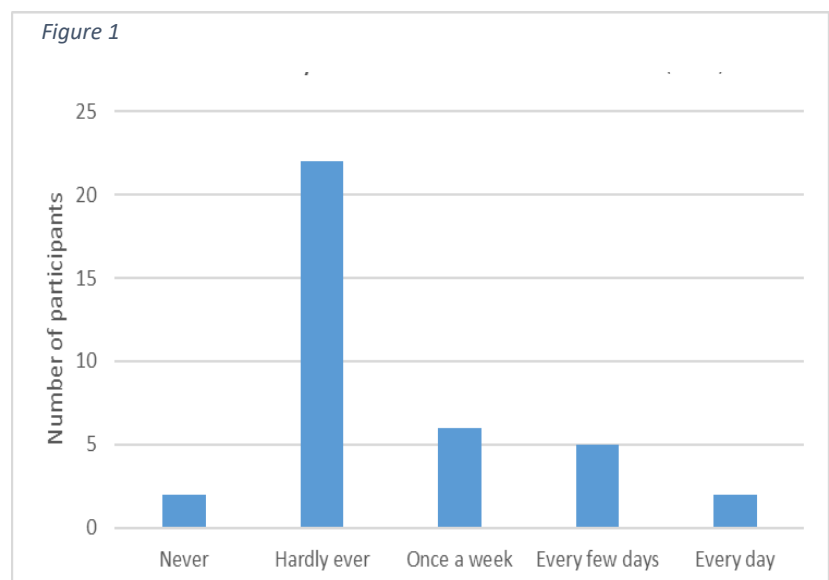
Figure 1 shows the frequency of looking at the Hestia Hub. Apart from two participants who have never looked at it, thirteen participants look at it every week or more frequently, whilst twenty-two hardly ever look at it. Many report looking at it at the beginning of the project. Others have their own methods of recording their electricity consumption and production, and some have had connectivity problems.

#### Hardly ever look at it: 22

This included participants who already kept detailed records of their gas and electricity consumption: 'I've kept meter readings of gas and both electricity meters, generally about twice a month. I keep an excel spreadsheet of them, so I've got a pretty good idea of a standard day's use of gas and electricity' [#322].

Other participants mentioned that they looked more at the beginning, for example:

'I did at the beginning. I do when I get the statement through. I have a look at that, but I don't find [online] very informative. It tells you a general thing when energy is cheaper... but it doesn't seem to change depending on whether the suns out or not.' [#6] and 'looked at it at the beginning, in terms of



*picking up the idea that the best time to use the energy is outside the peak end of day. Once I got that, that was it* [#342]

#### **Once a week: 6**

One respondent mentioned that they looked more frequently at the beginning of the trial: *'I do occasionally – When I first started out I was looking at it daily or more frequently, but now because it's levelled off a bit and I'm more familiar with it.'* [#354].

#### **Every few days: 5**

*'At the earlier – used to be daily...so 3-4 times a week ... And I find it fascinating to be able to'* [#309]. A few are looking at it every few days or more frequently.

### 6. What participants have learnt from the Hestia Hub (n=31)

Most participants seem to have learnt something from looking at the Hestia Hub. Two participants said that they hadn't learnt anything, but this seems to be mainly due to them not getting online, or the Hub not working on their tablet. For some the Hub has confirmed what they already knew, twenty-one found the information interesting, and six have mentioned changes in the timing of electricity as a result of looking and learning from the hub.

**Three participants mentioned that it confirmed what they already knew**, for example: *'We knew it already, although it's nice to see some more detail. Perhaps to realise the impact of some of the things we use'* [#306]. One participant who said it had confirmed mentioned that they appreciated the detail, another mentioned that they *'find the monthly SWELL reports quite enlightening'* [#304].

**Twenty-one participants have found it interesting.** This ranges from identifying times to use energy, such as *'Best times to use energy, although never quite sure when the community is producing PV and how weather affects when we should use power'* [#362], their personal peak consumption: *'Some unexpected spikes which have now been identified'* [#311]; and usage during the day: *'How the usage varies through the day. Relative power consumption of different appliances'* [#346].

Of these, **six mentioned the changes** (mostly small) in times when they use electricity, for example:

*'I know when is the best time to charge our electric car to help maintain community power consumption and, for future reference, to keep generation from being subject to huge peaks and troughs. And I set machines into operation depending on the availability of community solar power generation.'* [#336].

**However, two mentioned that they found the data too general, or not understandable by the layperson**, for example: *'I felt the times were very general... it was sort of guesswork as to when the times are. I found the monthly statement [... has been far more precise and more useful ... Maybe that is available online, but because I didn't find it particularly helpful at the beginning, I haven't gone back to look.'* [#333]. This is interesting to see how people use the different sources of information, and the importance of the software being useful at the introduction – as this is the time when most participants have looked at it.

One person who hardly ever looks at the online Hub now mentioned that they had **learnt quite a lot in the past**, for example: *'Quite a lot: 1) Some surprises in my usage (e.g. ovens in my newish cooker use more than I expected and how much I use at night (charging electronics and stuff like router on standby), though I can't feel pleased with myself as my night-time percentage seems about average for the community. 2) In general the timing of my power use. 3) Comparing my usage with the community as a whole 4) Seeing the effect of sunny weather!'* [#320].

## 7. Most and least useful information from the Hestia Hub (n=21)

### **Most useful information on the Hestia Hub**

Twelve participants mentioned seeing their data on the timing, usage and amount of their electricity consumption, for example:

*'Just the energy use tracking, so we can see what we've used over a month, and what times of day, and peak usage, and most expensive.'* [#306]; and *'The tariffs and our energy use over time'* [#363]; and *'24hr and monthly data very useful'* [#301].

Some participants mentioned that they have found comparison of consumption useful: *'Our own consumption figures and the ability to compare them with the community usage.'* [#360]

One participant appreciated the graphics: *'2) I like the graphics - they are clear and easy to understand,'* [#320].

### **Least useful information from the Hestia Hub:**

Participants also mentioned the least useful information, alongside suggestions for what they would like to see, or how the data could be used or presented differently. For example, some participants didn't find the average PV generation useful: *'Have not really found the community generation figures of much use'* [38]; and *"Average PV generation not that useful"* [#311].

Some are ambivalent, for example: *'Interesting but ambivalent about the value of the info'* [#334].

**Four participants mentioned that they would like to see historical data**, for example *'would be to see historic information to see how you've changed over time. If it was really smart it would be good to track the weather on particular days, to see whether you've been good or bad with good or bad weather.'* [#320] The latter point regarding consumption and timing during different weather is particularly interesting, as other participants have mentioned that they have found shifting their consumption to be easier in the summer. This is also echoed by a participant wishing to see more cumulative information about power generation, for example: *'The relationship between PV and Grid power is very useful and interesting but is only for one day. A monthly or even a yearly summary or accumulation would be even more informative.'* [#303]

One participant who looks at the Hestia Hub several times a day mentioned that: *'Least useful are the average values of values per household. However, I would also like to know the response time of the indicated community power consumption following an individual consumer's change of consumption. I have noted that if I shut off a 10kW consumption in the middle of the night, the community power consumption indication doesn't drop during the time I have been prepared to wait for it to do so!'* [#336]. This indicates that it might be good to have a variety of 'views' for the data according to the interest and knowledge of the user, and what they would like to use the data for.

## 8. Understanding of Hestia Hub information (n=27)

Most participants have felt that they understood the information on the Hestia hub, with twenty-five participants responding 'no' to the question 'Have you found any information on the Hestia Hub hard to understand?'. Two participants who mentioned that they have experienced difficulties mentioned the smart plug, *'Programming the smart plug and when it will activate.'* [#318]; and the use of the unit kW / kWh.

## 9. Other sources of information to manage electricity (n=38)

21 participants didn't use other sources of information to help them manage their electricity. 17 participants use other sources. These included<sup>2</sup> detailed records of solar PV generation and / or consumption of electricity (12), SWELL reports and newsletters (5), power monitors / Smart meters (3), energy bills (1) labels on white goods (1), and using a tariff-switching website (1).

**Detailed records of solar PV generation and / or consumption of electricity (12)**, for example: *'Yes. I've got a solar monitor that we use, doesn't influence consumption, but we do track solar panels, if only to be sure they're still working I suppose.'* [#306]; and *'I have been logging my meter readings daily for over 3 years.'* [#320]

**SWELL reports and newsletters (5)**, for example: *'My individual SWELL report shows my efforts have been succeeding, but I'm not sure if I will be able to maintain being awake at unsocial hours for very much longer!'* [#336] and *'I read the newsletters that come out, and they recommended doing the washing at times when the sun was out, and that fits in with day to day routines. So that's a handy tip, but obviously easier to do in summer than in winter.'* [#354].

**Power monitors / Smart meters (3), energy bills (1) and labels on white goods (1)**

**Tariff switching using a website (1)**. This participant's feedback is interesting to note: *'In the end it comes down to two things: How much is it going to cost me? And how am I going to make it better? And if you don't have that information in front of you, you get fed up very quickly.'* [#305].

## SWELL influence and discussions

### 10. Influence of SWELL project on day to day habits of electricity usage (n=37)

We asked 'Has the information you've gained from the SWELL project had an influence on any of your day to day habits of electricity consumption?' Thirty-one participants responded 'Yes' to this, and six responded 'no'. Of those who responded yes, many reported shifting of activities, such as using the washing machine and dish washer. Of those who responded 'no', some were producing electricity, some considered they had already made changes in their consumption, and some had family routines which they didn't want to shift.

**Yes (31)**. Most participants who answered 'yes' to this question reported shifting times of activities, to a greater or lesser degree. As before, the constraints of working hours outside the house did limit the capacity of some, for example: *'think it's altered what we do to some small degree. ... But you know after two people have been at work all day and its 7.30pm, then those that want to bath or shower, you're going to do it aren't you.'* [#306].

However, it is clear that some key information regarding heavy energy usage of washing machines, dishwashers and tumble driers has been taken on board and put into action, for example: *'We have shifted things into as late in the evening as possible... the best time is after 11 pm and I try to go to bed before that. So actually putting the DW or WM on at that time is sometimes quite difficult.'* [#333]; and *'to put it into practice, to look out the window and see if the sun's shining, and think 'actually I could leave the washing until tomorrow if its pouring down with rain. I would never do that before, but because of this trial happening, I've tried to get myself more conscious about it.'* [#337].

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<sup>2</sup> Note: some people used more than one source, so the sources will outnumber the participants.

To a lesser extent, other participants have shifted some cooking activities, either switching times of meals, or using a different mode of cooking such as slow cooker, for example: *'Sometimes opting to microwave or grill instead of using oven.'* [#320] and *'Come the winter, I've got a slow cooker I will use, when I want hot food I can put it on and cook it overnight.'* [#309].

**No (6).** Respondents who said no had a variety of reasons. For some they considered they were already using energy efficiently: *'We seem to have been using energy in a reasonably efficient manner and have not found the need to change.'* [#360]. Others thought they might change consumption habits in the winter months: *'Not at the moment, because I don't have any heating on at the moment or anything but in the winter time it probably will.'* [#310].

Others generated solar PV, *'No, because I generate 9kW so it's not going to worry me.'* [#305]; whilst other PV generators have changed habits: *We used to do everything during the day when we were most likely generating PV. But we now revert to using electricity for washing machine and dishwasher overnight plus charging phones etc. (well when I can get the smart plug to function as required)'* [#318].

An elderly couple didn't want to change electricity consumption when looking after grandchildren *'when we've got the grandchildren over which is regular at clockwork, you can't be stingy with electricity and gas'* [#365].

## 11. SWELL project information and influence on planning / purchasing new electrical equipment (n=32)

22 respondents haven't purchased or plan to purchase any new electrical equipment as a result of being involved in SWELL.

Of the 9 who gave reasons, these included having replaced some appliances shortly before participating in SWELL; or planning to take energy into consideration when purchasing white goods or lightbulbs, for example: *'so when I do replace them I will be looking for the most energy efficient one that I can afford.'* [#342]. However, for many this was something that they had planned prior to involvement in SWELL.

Ten respondents mentioned that they had made purchases of energy efficient appliances since being involved in SWELL. Three of these respondents mentioned specific things that they have already done, such as *'Prompted me to give greater priority than I otherwise would to energy efficiency in purchasing cooker for new kitchen 12 months ago and washer/dryer 2 weeks ago.'* [#320]; whilst the other seven referred to actions which they are planning on taking, such as *'should soon be investing in LED downlighters for the embedded ceiling lights which are very high power'* [#304].

## 12. SWELL project information and influence on low carbon technology planning / purchases (n=25)

Fifteen respondents said they weren't considering purchasing low carbon technology such as solar panels, in the short term at least, although ten participants were considering it or were interested in exploring it more.

**Fifteen respondents said they weren't considering purchasing low carbon technology such as solar panels, in the short term at least.** This was due to either considering it beforehand, for example *'We*



*did look at putting solar panels on when we had our garage built, but it was so expensive. And we're planning on moving, something we're considering.'* [#333]; it not being suitable (too expensive, or not owning own home), or having low carbon technology already. One interesting point made in this regard was the potential use for monitoring the performance of the panels over time, for example: *'We already have solar panels but it might give an insight into degradation of the panels over time if historical data was available. That might trigger a renewal of panels to keep the efficiency up.'* [#346].

**Of the ten who were interested**, apart from one person who was investigating internal insulation for their home, most were investigating solar panels either for their next house, or for some time in the future. One person is interested has been put off by disagreements, and the financial incentives, for example:

*'Want solar Pv but wife doesn't like the aesthetics of them and the ROI is still significant particularly as the FIT tariff has all but disappeared now as technology has come down in price.'* [#362].

## Being part of the SWELL project

### 13. Discussing the SWELL project (n=35)

We asked 'Have you discussed the SWELL project with other people?' Twenty-three responded 'Yes', twelve responded 'No'. About two thirds of participants have discussed the SWELL project with other people in a variety of settings (home, social, work) and people (family, social situations). The conversations have ranged from general interest to detailed technical discussions.

About two thirds of participants have discussed the SWELL project with other people. Of these there seems to be a good mix between discussing within the project, and discussing with friends, family and colleagues outside the project. This has ranged from: *'Just general interest amongst friends'*; and discussions with those near and far: *'Next door neighbours interested and seemed keen to join project but did nothing about it! Two sets of friends in Swindon. One pair are quite "green" and very interested. The others are not and quickly glazed-over! Also a family in St Albans interested, particularly the 16 and 10 year olds'* [320].

More technical discussions are also evident, for example: *'Discussion has been on a technical level with other engineers and physicists, and concerning mainly energy storage solutions.'* [#336].

Some mentioned there was more discussion earlier, for example: *'Certainly it has had a lot of conversation, mainly in the initial stages. A lot of people saying that it is a very good thing'* [#342]; and having conversations in a variety of social settings, such as *'In the SWELL drop in sessions and occasionally in the pub or Bowls club social situations'* [#318]. Others have found it harder to engage people: *'I find it hard to get people to engage in the subject, and the only way I can get them to engage in the thought process is when you tell them it might affect how powerful the big 6 are, and then they start to engage'* [#306].

One participant would like to be able to direct people to the website, but would like to see improvements to the communication on the website, for example: *'I found that though it's been presented well via the talks, it wasn't a good presentation on the YouTube on the site at the moment. That could actually be improved at your end.'* [#337].

Of note, and perhaps something to be addressed regarding timers, is this comment: *'Interesting discussion at work with a colleague who is a forensic archaeologist working with the fire brigade who*

was horrified to hear about the encouragement to use timers and those can be responsible for a reasonable amount of domestic fires' [#316].

#### 14. SWELL social events and how they have helped understanding (n=36)

Seventeen of the respondents have attended some of the social events, and nineteen respondents have not attended any events.

Of those who have attended, some have been pleasantly surprised at the amount of knowledge people had, and which they shared *'I'm just surprised at the knowledge people had. I went to one of the meetings, we met in the pub or something'* [#337]

There have been different experiences from the drop in sessions. Some participants reported learning *'Lighting. Scheduling of appliances where possible. Differing tariff prices. Domestic appliance consumption ratings.'* [#326]; for other it prompted purchasing LED lighting *'LED bulb change was prompted by the meeting in the Barrington'* [#318]; switching suppliers; or learning *'The drop-ins definitely helped me use the equipment lore effectively'* [#320]. Others have not learnt anything new however.

Of those who haven't attended any events, many mentioned that it was difficult to fit them in, either due to work and family commitments, or other obligations such as being a carer.

### Flexibility and timing of electricity usage

#### 15. Changes to the timing of electricity usage (n=38)

We asked *'are you conscious of any changes to the timing of your electricity usage? The majority of participants are conscious of changes to the timings of their electricity usage, with thirty-one responding 'Yes' to the question. Seven responded 'no'.*

The main large consumption changes include changing the time of use of washing machine and dishwasher. This has been achieved manually through being at home, using delayed timers (for example *'yes using more during the day e.g. dishwasher and washing machine on delayed timer to take advantage of solar generated power'* [#334]; or putting them on before going to bed, for example: *'Putting dishwasher on when going to bed instead of straight after dinner'* [#334].

Changes to cooking practices have involved using slow cookers, or *'My cooking times, because I enjoy cooking and I live alone, so I cook for two and have one meal that day, the second meal the next day. So there's less power used the second day'* [#309]. Other changes weren't listed, but have been based on the feedback, for example: *'Conscious change based on SWELL feedback'* [#301].

Some have made changes through not spreading out the usage of energy intensive appliances, for example: *'we endeavour not to run energy hungry appliances together. My wife is not happy about running washing machines, tumble dryers, dishwasher etc. at night just in case anything should go wrong.'* [#326]

Other changes reported have not necessarily been due to the SWELL project, for example: *'To be honest, the arrival of our electric car and the installation of our economy 7 meter has had a greater effect on the timing of our electrical consumption than the SWELL project itself.'* [#336]

## Electricity usage

### 16. Times of day and week when using most electricity

We asked 'At what times of the day and week do you use most electricity? What happens at those times?' (n=33). Eighteen respondents reported that they are still using the most during the morning and evening peak, although they might have shifted loads such as washing machines and dishwashers to other times

For many of the respondents using most in the peak times, their electricity consumption patterns are driven more by their working out of the house, or the demands of family life. For example:

- *'Most at the weekends, and early evening when I return home from work. Preparing meals, cleaning house, watching TV etc.'* [#468] and
- *'Morning and evening peak, probably. Lights on, microwave for porridge (or oven for cooking), TV for the boys, radio for me. Not things that we can easily switch to other times of the day.'* [#316]
- *'Evening I would think, between 7-10, probably. Really it's about coming home and having a shower and cooking some food, that's what goes on.'* [#306]

However, some have shifted significant loads, with some using more during the daytime when there is solar: *'During the week probably 11-4 to make the most of the Solar production washing machines, dishwasher, dryer'* [#362]; whilst others have switched to overnight, although as mentioned above, this is mainly due to the arrival of electric car and switching to economy 7:

*'The hours of our maximum electricity consumption are from 2am to 4am, but in general from 12:30am 'til 7:30am BST. Our heavy-consumption equipment is used at those times: electric car charging then, sometimes, the dishwasher, washing machine and tumble dryer. Several other small battery charging activities are also carried out between those hours.'* [#336]

### 17. Flexibility when using electricity (n=34)

We asked 'How flexible is your electricity usage during the times you use most electricity? Could you shift some activities if necessary?' (n=34). Twelve respondents said they could be flexible, mainly as they had flexibility during the daytime, but twenty-two said they couldn't be. However, we need to take into account for some of these, it is because they have already shifted the timing of their electricity usage. In advance of the final survey, it would be good to further investigate the participant's perception of flexibility and when they use most electricity through the electricity monitoring data, and to analyse the extent to which shifting has taken place.

Those who could be flexible included people who didn't leave home for work: *'we work from home we are able to do this.'* [#363]. Some people could still be flexible about shifting electricity consumption. For some this would involve persuading their family more, for others they could be flexible about specific things if they have time flexibility, for example clothes drying.

Others seemed a more inflexible about their usage of electricity. **For some this was because they had already shifted their usage times during the SWELL trial.** For other, usages involved more of a family routine which they would find difficult to shift, for example when grandchildren are visiting *'Telly going, and you name it they've got it going. I don't mind, they're my grandchildren.'* [#365].

Others however had a routine which they would find difficult to shift for example:

- *'Not at all flexible, we have a routine. I should also add at this point that my wife and I are not fanatical conservationist but are happy to do our bit where possible.'*; [#326]
- *'I could, washing and varying dishwasher a bit more, but current timings suit me. I'm a creature of habit!'* [320].
- *'Not really, only occasionally watch TV at other times of day.'* [#310]

## General reflections and thoughts

### 18. Other reflections or thoughts

Twenty-one respondents wrote reflections and thoughts, which were on the whole positive, although some included suggestions and thoughts for the future. Examples of the range are grouped below. It is clear that the ongoing communication, quick response time and potential scale up of the project has been appreciated by the participants. Additionally, learning about consumption and shifting usage has happened on a number of levels, from those with minimal prior knowledge about energy efficiency, to those with most professional knowledge.

#### Generally positive.

- *'Only that I think it's an amazing thing and I'm really really pleased to be able to contribute. It's something that I really do support and engaged by, although I don't feel that I can do much more than I can do, I'm really happy that its going on, and I'm really interested in what it does, and I hope it can do something really meaningful, as I do think it has scope.'* [#306]
- *'I think the team are fantastic, lovely ... the guy that have come and Sarah, everybody is just super. I think that the efforts that they've made are just wonderful, and having these occasional dos ... I think it's really nice and very encouraging. I think it took me a little while to register that I should be trying to change my habits a bit more. Even a supposedly conscious person it took time to register fully'* [#302].
- *'As a lifetime electrical engineer, it has proved very intriguing how a slight change in home power use can make significant changes to a pensioner's budget and encourage my continued interest in my chosen discipline.'* [#303]
- *'Please keep up the good work. This isn't just about technology it is about changing the state of mind of millions of people many of whom simply don't care about things like this. It needs to become part of the way of life and that will be a long time for some people but sooner for many'* [#304]
- *'Finding this project really interesting, especially now we have the monthly updates to read from Sarah'* [#316].

#### Suggestions for future included

- *'If you could get a newsletter out to us and put it in the layman's term. [have you seen the newsletter?] Not really good, I want simple questions and simple answers. I don't like all these percentages.'* [#365]
- *'The following is a selfish suggestion which I wouldn't mention...but you asked: I would be happy to see the Maslow battery (which is part of the SWELL study at our home) set to recharge when our economy 7 meter is on night rate, i.e. starting after 12:30am BST.'* [#336]
- *'It may be useful to be able to see weekly data instead of 24 hours' data if that is possible'* [#328]

#### Impact on energy usage:

*'Participation has definitely made us more conscious of our energy use and look forward to the advent of variable tariffs in Shrivenham.'* [317]