5 What lessons were learnt from the program, what were the enablers?

One of the objectives of HEEUP was to identify lessons from the program including what enabled the program to function effectively and what the barriers were.

This section of the report includes:

1 HEEUP research case studies
2 Lessons from the reflective practice process

RESEARCH CASE STUDIES

The eleven household case studies presented in this chapter provide insight into a small group of participants' motivations for joining the Brotherhood of St Laurence's Home Energy Efficiency Upgrade Program (HEEUP) and their experiences of the program. They highlight factors influencing householders' decisions about upgrading hot water services and illustrate some of the ways HEEUP achieves and fails to achieve its stated objective of addressing barriers to upgrading hot water services.

Collectively the case studies add to the research knowledge about residential energy efficiency in the context of hot water and the factors that facilitate participation in energy efficiency programs for households with low income.

Summary of results

Household context

The case study households were different sizes, at different life stages and managing their energy use and upgrade decisions in the context of varying levels of low income, wealth, financial hardship, energy bill arrears and access to suitable financing options.

They all had old hot water services, some of which were unreliable or damaged and one of which was completely in-operative.

Participants' goals

Case study participants had varying reasons for joining HEEUP, including

- improved energy efficiency of hot water service to improve affordability of household energy use
- decreasing the environmental impact of their hot water consumption
- ensuring the reliability of their hot water service
- amenity benefits such as improved hot water and control over hot water

Lessons learnt

The case studies illustrate some experiences of the eleven participating households, including that HEEUP addressed:

- capital barriers through a combination of either rebates, loans or full funding
- information barriers, mostly through a mixture of EEO and installer advice
- the tenancy barrier.

HEEUP did not overcome information asymmetry and trust barriers for one household and did not run long enough to engage one other.

Case study households reported achieving energy savings, bill savings, greener energy use and peace of mind.

Changing purchasing decisions

HEEUP influenced case study households' purchasing decisions by making upgrades possible, bringing upgrades forward, making upgrades more energy efficient and influencing future purchasing decisions.

Research framework

The HEEUP case studies provide description and illustration of the householder experience of HEEUP and exemplify some of the findings of other parts of the research.

The case studies focus on the third and fourth of the HEEUP research questions:

3. Has HEEUP overcome the identified barriers (capital, information, trust) to energy efficiency for low income households?

4. What has enabled and impeded achieving program goals?

Research objectives

The objectives of the case study research are to:

- describe and illustrate the factors influencing decisions in relation to upgrading hot water services, with a focus on the role of information and financial capital
- present feedback from householders about their experience of the HEEUP program
- provide input to the HEEUP lessons learnt research
- illustrate some of the real world complexity shaping the results of the quantitative data analysis

Selected literature: Pro-environmental behaviour change

HEEUP aims to address capital, information and trust barriers to the upgrade of hot water services for homeowners on a low income. It aims to test whether addressing these barriers shifts people's purchasing decisions to more energy efficient choices.

Shifting people's hot water service purchasing behaviour toward a more energy efficient choice is an example of pro-environmental behaviour change. For pro-environmental behaviour change programs to be successful, attitudes, behaviour, context and habits need to be addressed together (Stern, 2000).

Abrahamse et al. (2005) have refined this broad framework of attitudes, behaviour, context and habits to argue that macro-level factors including technological, economic, demographic, institutional and cultural (contextual) factors can shape the motivation, abilities and opportunities ('micro-level' factors) in households. This reflects a central question in the HEEUP trial; does providing access to capital and to appropriate information from a trusted source, positively influences people's motivation, abilities and opportunities to undertake pro-environmental behaviour change?

The case studies illustrate the operation of these elements in the experiences of a small group of HEEUP program participants. In particular, they focus on the role the information and financial capital provided through HEEUP had on upgrade decisions and the enablers and impedance to positive program outcomes.

Another aspect of motivation in the context of HEEUP relates to the particular goals of energy efficiency. Residential energy efficiency can decrease the amount of energy used in the home, or increase the level of amenity enjoyed in the home with little change to the level of energy used (IEA, 2014). Where energy use decreases, this can decrease household expenditure on energy (where price remains constant) and decrease the greenhouse gas emissions produced (IEA, 2014).

Research design

Case studies were chosen for this part of the research because they can produce rich, qualitative knowledge about the social and situational issues known to influence behaviour change (Flyvbjerg 2006). They can capture the uniqueness of how a program functions for each of the small number of case study households (see Berg, 2004). As well as shedding light on the dynamics present in a single household, they can also illustrate issues in the larger analysis (Eisenhardt 1989).

Research participant recruitment

The 11 households participating in the case studies joined HEEUP between May 2014 and December 2015. Households were purposefully recruited to reflect characteristics known to influence energy and hot water use, including different household sizes and life stages, households with a member with a disability requiring additional hot water use and not, electric only and dual-fuel homes. They were also selected to represent different program experiences and pathways including recruitment channel, program phase, NILS finance used or not used, metropolitan Melbourne and rural Victoria and upgrade type. Once shortlisted, households were approached using the least common criteria first, until 11 households were engaged in the research.

Consent

On entry to HEEUP, participants were asked to nominate whether they were willing to be contacted by researchers regarding this study. The contact details of consenting project participants fitting the target criteria were provided to the researcher who made an initial phone contact to describe the research. The voluntary nature of participation was reinforced in this explanation. Participants expressing interest at this stage were sent the plain language description and consent form and re-contacted by telephone to discuss the study. Those who wished to join the study after this discussion had an interview booked. They were interviewed in early 2016.

While desirable, it was not possible to recruit households according to their level of energy usage (high, medium or low) because of a lack of data. Those who agreed to participate did not include households requiring an interpreter to participate in HEEUP, multi-family households, or households that received HEEUP information but did not join the program.

Data collection items and collection process

The following data was used in the case studies where consent was provided by participants and EEOs:

- Participant interview data on hot water use, rationale for upgrade, feedback about the program experience, barriers faced and addressed. This was collected in audio recorded, semi-structured interviews, using an interview guide, conducted in a home visit
- Photos of hot water service and hot water use
- Energy consumption meter data and expenditure data
- Program administration data as recorded in the BSL HEEUP database including demographic data, referral pathway, advice provided (including from HW tool), loan data, quote, install, repayments
- HEEUP case manager interview data on barriers the household was facing, what worked, difficulties, surprises, learning and changes. This was collected in an audio recorded, semi-structured telephone interview, using an interview guide.

Analysis

Interview data was transcribed and collated alongside the administrative and energy and water use data and photos where available.

Data was coded using a framework informed by the pro-environmental behaviour change frameworks described above.

The analysis informed the development of each of the household case studies with a focus on the effect of the information and financial capital provided through HEEUP on

decisions. They describe some of the lessons learnt in program delivery and illustrate the outcomes of HEEUP in the eleven case study households.

The second stage of analysis draws out typologies of hot water upgraders in response to the question; Did HEEUP influence purchasing decisions?

Points illustrated in the case studies

The eleven householder case studies describe the participant journey through HEEUP including:

- context – the reasons the participant joined the program and what they hoped to achieve,
- experience – feedback from the participant on their experiences with HEEUP, with a focus on program processes and the role of finance and information, and
- outcomes – what's changed for the household.

Contextual factors that influenced participation

The householders participating in HEEUP were at different life stages and managing their energy use and upgrade decisions in the context of varying levels of income, wealth, financial hardship, energy arrears and access to suitable financing options.

They all had old hot water services, some of which were unreliable or damaged and one of which was completely in-operative.

The influence of these factors is evident in the householders' decision to change their hot water service and also in their motivations for participating in HEEUP.

For example, households with solar PV could benefit from heat pump technology that potentially brought significant savings to them via managing their water heating to maximise their solar feed-in-tariff. The households facing significant financial hardship chose hot water services that they felt would be most reliable in the long-run. The influence of contextual and 'macro' factors (Abrahamse et al. 2005) on the opportunities and decisions made in households are illustrated throughout.

The case studies demonstrate energy efficiency goals frequently noted in the research literature:

- affordability of family / household energy consumption by; changing to a more energy efficient unit, changing to a unit that costs less to run, or changing the unit to one that can maximise the savings associated with previously installed solar PV
- decreasing the environmental impact of hot water consumption by; decreasing energy consumption through greater energy efficiency or by 'greening' consumption by switching to renewable (solar) energy for heating water.

They also reveal additional objectives in the motivations of householders engaged with HEEUP. These emergent objectives include the reliability of the hot water service over time and amenity benefits, for example a temperature controller on the unit.

Lessons learnt

The case studies also highlight some of the enablers and impediments to program participation and to addressing barriers to energy efficiency upgrades.

Enablers

Enablers evident in the case studies include that HEEUP:

- addressed the capital barrier through providing rebates, access to no interest loans and further or full funding for those with no ability to service a loan (all households)
- addressed information barriers and asymmetries through a mixture of advice from trusted sources including HEEUP EEOs, installers and energy retailers (Anna, Sarah, Michelle, Rex and Lin, Bill)
- addressed the landlord/tenant split-incentive (Ron)
- assisted householders to navigate program processes through an EEO skillset that included technical as well as communications and support skills (all households)
- engaged the targeted households by connecting with energy retailers (Janet, Anna, Bill, Sarah, Danielle), hot water installers (Isabel, Rex and Lin, Jenny), Community Housing providers (Ron), local government (Ehsan) and water retailers (Michelle),

Impediments

Impediments to achieving program goals evident in these case studies include that HEEUP did not:

- always overcome the plumber / homeowner split-incentive and information asymmetry (Sarah, Jenny)
- run long enough to fit all households' timelines (Danielle), and
- provide information considered trustworthy (Sarah).

Outcomes

In all of the case studies where program participation led to a hot water service installation, people felt they were achieving the goals they set out to achieve including energy savings, bill savings, greening their energy use and peace of mind.

The case study stories illustrate the way HEEUP addressed macro-level factors, such as capital, information, institutional and technological factors to broaden the opportunities available to people to make pro-environmental choices in upgrading their hot water service.

The influence of HEEUP on purchasing decisions

HEEUP influenced purchasing decisions in four ways; making upgrades possible, bringing upgrades forward, making more efficient upgrades possible and influencing future purchasing decisions.

HEEUP made upgrades possible by:

- engaging with Ron's landlord to address the common barrier of tenants not having the authority to make such a changeover in a property they do not own
- fully funding the replacement of Michelle's completely broken-down hot water service and of Isabel's hot water service that was causing very high, unaffordable bills. The purchase of a new hot water service was otherwise unaffordable in both these households.

HEEUP brought forward the changeover of hot water services in five households thereby avoiding a replacement at breakdown.

Anna and Janet described how, in the absence of a program like HEEUP at the point of breakdown, they would probably make a rushed decision that may not be the best decision either financially or environmentally. Sarah described how without HEEUP, a replacement at breakdown would push her into significant financial hardship.

Rex and Lin and Ehsan also brought forward their upgrade but did so because they wanted to move to a more efficient or renewable system and HEEUP provided the opportunity to do that now.

HEEUP made a more efficient choice affordable for Isabel, Anna, Janet, Rex and Lin and Ehsan, who without HEEUP may not have been able to upgrade to the more environmentally friendly system they wanted. Bill was going to changeover his unreliable hot water service anyway but **the information he received through HEEUP emphasised the benefit of solar in his situation** and changed his choice.

Danielle did not upgrade during HEEUP, but felt **the information she received** about the comparative running costs of different hot water service options **would influence her choice** when she got to the stage of making a purchase.

The participant case studies

The following pages present these case study stories:

HEEUP response to a broken-down hot water service

Michelle's story identifies a gap in the community support system that HEEUP was able to address for a household with a broken-down hot water service. It illustrates the importance of being able to fully fund a replacement when the household can't afford it and demonstrates the benefit of HEEUP connecting with water retailers as well as energy retailers.

North-eastern Melbourne

Water company referral

Joined August 2015

Install September 2015

Gas storage to instant gas

It describes strategies used by a family to manage without hot water and highlights the importance of HEEUP being able to respond rapidly.

Michelle's story

Michelle's hot water service had broken down and while she was working to get a replacement, Michelle and her teenage children managed by boiling water on a camping stove and using the electric kettle. They showered at Michelle's parents' home and otherwise made-do with cold water.

With no capital to finance an upgrade herself, Michelle had tried all the avenues she could think of, her energy company, insurance company and superannuation fund, emergency relief, financial counsellors and three community service organisations. The avenues Michelle tried were sympathetic; 'I was helped talking wise but I wasn't helped financially'. In the end, her water retailer referred her to HEEUP.

As soon as she made contact, things moved swiftly. A temporary hot water service was installed so Michelle and her family could return to some normality in their daily routines.

The HEEUP EEO came out to Michelle's home the following day and the quotes and NILS loan application were developed straight away.

The timing of the hot water service breakdown couldn't have been worse. Michelle is currently managing a large mortgage and significant utilities arrears that were accrued during her absence from the home post-separation. A NILS loan was unaffordable because of this level of debt.

The HEEUP team assessed Michelle's situation as high need, with potential for a large benefit from the changeover. Her defunct electric storage hot water service was inefficient and had been extremely expensive to run. The BSL fully funded the installation so the replacement could go ahead.

Michelle has a generally energy conscious and pennywise approach. She has previously accessed support to improve the efficiency of light bulbs and showerheads and fixed a leaking toilet and washing machine. She also removes light globes so they don't get used.

For Michelle, the decision about what type of hot water service to upgrade to was influenced by wanting a system she wouldn't have to worry about. She felt confident the information she received through HEEUP was well researched and found the advice from the plumber very helpful. Michelle wanted a system that was efficient and effective for her household size and also felt the cost of solar was an 'extravagant' expense. For these reasons Michelle chose an instantaneous gas system.

Flexible finance options can enable efficiency upgrades

Sarah's story illustrates the way HEEUP addressed the capital barrier to a hot water service energy efficiency upgrade for a householder who wanted to improve the affordability of her family's energy consumption. It shows that additional drivers in the decision about the type of hot water system chosen became evident after Sarah got involved in the program; reliability over time and access to a temperature controller on the unit.

South-eastern Melbourne

AGL letter recruitment

Joined July 2015

Install October 2015

Gas storage to instant gas

Sarah's story exemplifies some of the ways HEEUP expands the opportunities available to householders to make upgrades. Enabling aspects of the program included; the offer coming directly from her energy retailer, access to a no interest loan in the context of a lack of suitable financing options, the flexibility to provide an additional rebate to make the changeover affordable and the ease of repayment through Centrelink.

A split-incentive that is faced by many plumbers is toward recommending a system that is more profitable for them because of commercial links, or because it is simpler for them to install (DRET, 2013). HEEUP aimed to provide independent information, however Sarah wanted additional information about hot water energy efficiency upgrades so researched them herself.

Sarah's household also achieved an additional unintended benefit of the upgrade.

Sarah's story

When Sarah first received information about HEEUP, she was getting behind in her electricity and gas bills, so HEEUP presented an opportunity to change her hot water service to a more efficient unit. She hoped this could bring down her everyday hot water-related expenditure to make bills more affordable.

Sarah's current (gas storage) system was nearing the end of its life and **she definitely didn't want a repeat of the awful situation she was in ten years ago when her hot water system broke down**. She and her three young children went six months without hot water because a replacement was just too expensive.

After an initial meeting with HEEUP staff and a recommendation to switch to a gas-boosted solar system, Sarah did extensive additional research on upgrade options because she felt the information she received from HEEUP was a 'hard sell' on solar that didn't adequately take account of her situation. She read a lot of online reviews of solar systems and sought advice from two plumbers. Sarah particularly wanted long-term reliability of her hot water service.

The Energy Engagement Officer who provided the HEEUP advice to Sarah said that although solar was more cost effective in the long run, he wasn't able to provide the exact costs and savings of each different system type because the quotes weren't available from the supplier at the time of the home visit. He also explained that Sarah

was concerned about the reliability of solar and whether she would have the time and money to manage future maintenance or repairs.

In the end, Sarah chose instantaneous gas because it suited her household composition which varies regularly from two to five people, concerns about solar heat losses from shading by two large trees on her northern boundary, fear of the loss of discounts provided by her energy retailer if she went solar and doubts about the long-term reliability of solar and a concern that 'if it failed after a year, there would be a good chance that I wouldn't be working enough to get it fixed'.

Sarah is a self-reliant upgrader who did her own research in addition to the information provided by HEEUP. Another important factor in Sarah's decision making was that she found a unit that has a temperature controller, which is important for her son's needs.

> …being able to adjust the temperature for my son in the bath. It's allowing him to have more independence. He has autism, he only has baths. So it means – because he's 12 now – it means he can have a bath on his own and I don't have to worry. So I don't have to be nearby and I don't have to sort of be, every time I hear him turn the tap on - because he was tending to just put the hot on and he would sit there until he burnt himself.

This unintended benefit has led to greater autonomy and wellbeing for Sarah's son and more independence and peace of mind for Sarah.

The greatest benefit for Sarah was the flexible subsidy and finance options that made the upgrade possible. Sarah accessed a $1,400 loan through the No Interest Loans Scheme (NILS) to cover the up-front, out-of-pocket expense that would have made an upgrade unaffordable. At first there was doubt about whether the repayments were affordable and there was a lot of chasing up of information that was time consuming and frustrating for Sarah. Eventually the HEEUP subsidy was increased slightly to $641 to bring the loan amount down. This was important because Sarah didn't have other reasonable alternatives for financing a hot-water upgrade; HEEUP made it possible. As she explained;

> …well if it explodes on me, I'm going to be putting it on credit and paying a higher interest rate, so I'll be worse off than I am now. And I'd probably have to fudge figures with some dodgy finance company to get the finance.

Sarah uses Centrepay and bill-smoothing for her utilities costs, so having the $27 per fortnight loan repayment coming straight out of her carer pension through Centrepay, is straight-forward.

Even though paying back the loan is presenting budget challenges, balanced against rising energy costs and the risk of her old hot water service breaking down, Sarah feels she has made the right decision.

HEEUP can assist environmentally conscious householders afford more efficient upgrades

Anna's story provides an example of HEEUP addressing the capital barrier to a high- efficiency upgrade for someone who did not have sufficient capital to make the 'environmentally conscious' choice they would have liked.

North-eastern Melbourne

AGL letter recruitment

Joined March 2015

Install April 2015

Gas storage to heat-pump

It demonstrates how a household with solar PV was able to benefit from heat pump technology by using their generated electricity to heat water while the family was out during the day. It also shows how information from both the EEO and installer was needed for calculating costs and benefits in this complex situation.

Anna's story shows the impact of under-insurance on a household's ability to recover from flood damage and the way a hot water upgrade has influenced one householder's future appliance choices.

Anna's story

Anna has an interest in the environment.

> I've got two kids and I would like them to have a planet to breathe on into the future.

She has friends who were early adopters of photovoltaic electricity and drive hybrid cars. Anna says they can afford to make those sort of decisions, but she's in a different position. Anna has two children and recently bought her ex-husband out of the home, so she has a large mortgage, high living expenses and a small income from part-time employment. The house was severely damaged in floods and she took out a loan to do repair work, but the budget didn't stretch to the hot water service, so she left that to 'limp along'.

Anna had a really positive experience of the program and said 'everyone I dealt with was uniformly fantastic'. **She felt HEEUP helped her make a 'planned and measured' decision that was the best solution for her.** This was preferable to an emergency replacement at the point of breakdown.

> If I'd left it until the thing was dead - I mean, can you imagine? Your kids can't have a hot bath or shower. I mean, you're just - you're just like, just chuck it in. I don't care if it's got a zero star rating or it's costing a fortune. I just need the hot water. That's what would have happened to me.

Anna had joined HEEUP originally wanting solar hot water because she 'hadn't really heard of heat pumps'. She received a recommendation from the installer for a heat pump programmed to run during the day. **Anna has solar PV but gets a low feed-in tariff, so it's best for her household to use the power generated during the day while they're out:**

> If you've got free electricity during the day, why aren't we using it to heat your water?

Anna said she really valued the expert advice of the installer who provided detailed information and quotes. She said the EEO gave her 'a lot of comparison information but I found it a bit overwhelming… what really swung me to the decision was the photovoltaic on my roof and that was not in the comparisons at all'.

The changeover also influenced future purchasing decisions. When Anna's dishwasher needed replacing, she researched and chose one that takes in hot water, rather than heating it, so she could maximise the use of the heat pump.

HEEUP helped address very high energy use

Isabel's story exemplifies the way HEEUP was able to provide substantial benefit to a household where the hot water service was having a major impact on energy expenditure. It highlights the importance of having fully funded support for some clients with high needs.

Remote coastal Victoria

Enviroshop recruitment

Joined July 2015

Install January 2016

Electric storage to solar electric

It also demonstrates the way NILS program processes can be overwhelming and the importance of the EEO skillset in supporting clients and identifying households where additional support is required.

Isabel's story

Isabel lives in an early Victorian cottage in a tiny coastal village. She has access to on-grid electricity, but not gas. Isabel has large water tanks that supply her with ample water for her needs. Her electric storage hot water service had a header tank on the roof where the hot and cold water were pumped up to be mixed before it came back down into the house. When she moved in to the property about three years ago, it wasn't working, so she made-do by boiling the electric kettle for her hot water until she was able to get it fixed six months later.

When Isabel saw the HEEUP advertisement in the local paper, she'd been having further problems with the hot water service. The header tank was leaking and so the pump was continuously running to keep it topped up and the boiler had to run a lot more to keep heating the water. This would have been contributing significantly to her 'over the top', unaffordable bills.

Isabel sees solar as the appropriate technology for her situation. She is motivated by both environmental and financial reasons. As she explained it;

> … because we've got so much sun here, what happens is, my hot water pipes used to warm up in summertime, so I could shower with cold water, but having hot water. And I thought 'wow' solar will be really great!

Isabel was unsure at first whether she would be able to access HEEUP because of the location of the Brotherhood of St Laurence being so far away from her home. But when she made contact, she was pleased to discover the application could be made over the phone and internet and a local installer could provide the quotes and manage the installation. Computer access and literacy bridged the distance.

Nonetheless, the process wasn't straightforward. Isabel spent a lot of time with the HEEUP information, application forms and quote trying to work out whether it was the right thing for her to do.

> I could see the benefit of it, but, even with the benefit of getting nearly halved or paid quarter of it…I still couldn't afford it. It was just one of those things. As you can see, I've got no sink.

Isabel applied for a NILS loan and found trying to provide all of the detailed information needed for that, overwhelming.

> I said to the young man on the phone …' I'm giving up. I can't handle this ... [providing] Centrelink papers and bills and I thought, no I can't and its part of it that stressed me out completely … and yeah I'm sitting throwing my hands up in the air and panicking and crying, but yeah, no he was professional and very caring.

The HEEUP worker assisted Isabel to complete the NILS loan application. This involved many phone calls and emails, at times just checking how she was going, not only to collect the needed information.

The NILS assessment identified the loan would be unaffordable and a decision was made that the upgrade be fully funded.

The installers came from a larger town about an hour and a half away. They removed the old system from the roof and installed a new solar system with an electric backup and tank. The electrician also upgraded the fuse-box so it would be compliant with electrical safety standards.

The hot water changeover led to saving both electricity and water.

> I find that it's far more efficient now, because the hot water is hot and I don't have to run the water. I save water now actually. There's a two-way thing now, I save water and electricity, because the water I used to have to run and run until I got to the hot water.

This new system is saving even more electricity, because the pump doesn't need to run continuously to keep the system topped up.

HEEUP can influence future purchasing decisions

This household joined HEEUP but did not proceed to making a hot water service purchase. Danielle and Lucas' story illustrates the influence of timing in relation to a renovation project cycle and budget, and investment payback times in relation to family life stage. It is an example of HEEUP having a legacy benefit through the education it provides and reveals a need for flexible delivery approaches such as phone advice.

South-eastern Melbourne

AGL letter recruitment

Joined May 2015

No hot water upgrade

Danielle's story

Danielle and Lucas are extending their home to accommodate their family of four and Lucas is doing the building work himself. The way they manage the budget is to look for low-cost opportunities well in advance. For example, they try to source things second-hand (Lucas is a '*Gumtree* fanatic'), but if they can't, then they'll consider purchasing something new.

The payback time of hot water service investments is an important decision making factor. A five year payback time on a hot water upgrade would be a good length for Danielle. Partly because if it were much longer, the technology would be obsolete by the time it's paid for and partly because she wants to see the returns sooner, rather than later. Danielle and Lucas are at a stage in life where they're under a lot of financial pressure. They have two young children and have only recently returned to part-time work. Danielle expects their financial position will be much stronger in five to ten years' time and so the bill savings won't be as important then, as the cost of the upgrade would be now. She also isn't sure whether her family will still be living in the same home in the long term.

When the letter about HEEUP came, it seemed like it could be one of those low-cost opportunities Danielle and Lucas keep their eye out for. However, they were a long way off installing their hot water service, both in terms of the renovation project stage and the budget.

When Danielle contacted HEEUP, she wanted to get some basic information about how the program worked and what was involved. Like the light-globe replacement scheme, she thought it could be a good deal, or might not be.

The response from HEEUP was to book a home visit. Danielle felt this wasn't the best use of everyone's time. She would have preferred to have a short chat on the phone to discuss her needs and get some estimated costs on the various upgrade options. Instead, a HEEUP Energy Engagement Officer came to her home, spent two hours doing a detailed assessment and signed Danielle on to the program. She also felt it was a waste of the installer's time to develop three different quote options, when she was still just at the information gathering stage. The HEEUP program process was mismatched to this household's needs.

When the quotes arrived Danielle wasn't ready to make a decision. She said 'I can't think hot water when I don't have plumbing, I don't have electrics and plaster'.

The next contact she had from the program was when she received a letter advising the program was closing soon. That was toward the end of the year and there was 'too much going on'. Danielle felt they'd just run out of time and they decided not to follow up and re-start the process.

The information provided through HEEUP may have a legacy benefit in this household. Looking back, Danielle felt that although they missed the opportunity to receive the rebate and finance available through HEEUP, she still benefitted from the education about the different running costs of the various options. She said she hadn't thought about the running costs of hot water before.

> I may have just gone for another gas storage, for example, even though my husband wanted instant gas. But then I didn't realise the boosted solar could save you so much money and it would pay for itself over a few years … So it actually was good to hear how each system worked and what the capabilities were.

I asked Danielle, 'When you do get to the point of making the decision, how do you think the information that you received as part of this process will influence that?' She replied:

> That will be quite useful actually, because I probably wouldn't have contemplated spending the higher amount of money on the boosted solar, for example. But, because we're going to be running quite a large house, I need my costs to be down.

HEEUP engaged environmentally minded retirees

This case study of Rex and Lin illustrates the HEEUP partnership with Enviroshop, which facilitated upgrades in 52 households, many of whom were environmentally minded retirees like Rex and Lin.

Eastern Melbourne

Enviroshop recruitment

Joined September 2015

Install November 2015

Gas storage to heat pump

It shows how the experience of retirement on a lower fixed income can shape householder attitudes to day-to-day budgeting and long-term financial planning.

It also illustrates how support for upgrading a hot water system can assist people to age well in the place they live.

Rex and Lin's story

Rex is keen on heat-pump technology. It piques his engineer's curiosity about new technologies and his environmental bent. Also, because he already has solar PV, it's a cost-effective way for him to heat water.

> Well, it's not using fossil fuels, and you know, it's perpetual motion if you like, apart from a little bit of electricity. Those things appeal to me.

Rex had been having a few problems with his hot water service. He'd moved it once, to try to reduce the amount of time it took for the hot water to get to the shower. He'd also had a leak repaired that was spraying onto electrical wiring and blowing the fuse. Rex felt it was 'near the end of its useful life'.

Rex contacted Enviroshop, where he's a long-time customer, to inquire about heat pumps and see what they thought of them. But he was turned off when they told him the price.

HEEUP can make newer technologies more affordable. Enviroshop knew Rex was pension age and asked him whether he had a concession card. He didn't, but was in the

process of applying for one, so he proceeded with the heat pump quote and put the HEEUP application in process.

Lin is very budget-conscious and keen to save so they can afford their retirement. She's aware that gas prices are rising and wants to maximise the benefit they get from their solar PV system.

Rex and Lin have a high feed-in tariff on their solar PV, so Lin tries to do large energy using activities, such as steam-mopping the floors, during off-peak times. This seems counterintuitive because it's not using the solar power their system generates, themselves. Rex and Lin explained that it's '…not solar, but cheaper. You've got to be an actuary to work that out. Sometimes it's better to be using theirs … because we get 60 cents or 67 cents'.

The most advantageous arrangement for them is to sell the energy they produce back into the grid and use power at off-peak times. They want to run the heat-pump during the night and this is being arranged.

Where possible, Rex and Lin are investing in staying in their home. Their children are grown and no longer need their financial support, so any spare money they have is being used to adapt their home so they can continue to live there for as long as possible. It's something they feel they've 'got to do' if they want to stay in their current home.

Furthermore, as they age the physical benefits from hot water are becoming more important. Hot water is a comfort, particularly to Rex who loves his hot showers:

> I have the longest hot showers in creation … If I've got to go without that, then what's left in life at 83? A hot shower is the highlight of my day.

HEEUP can address the landlord / tenant split-incentive

Ron's story is an example of a HEEUP installation through the Community Housing activity stream. It illustrates how HEEUP was able to bring peace of mind to a householder worried about his unreliable hot water service.

Nothern Melbourne

Community Housing recruitment

Joined June 2015

Install August 2015

Gas storage to solar gas

Ron's situation highlights some of the complexities that can be faced in household energy management; differing energy needs, the landlord / tenant split-incentive and the difficulty of measuring the impacts of energy efficiency when there are multiple influences on energy bills.

Ron's story

Ron has been worried about his old, unreliable hot water service. It was expensive to run, ran hot and cold and often needed recharging, even in his small two person share-house. HEEUP brought an opportunity that he hadn't really considered before, because as he says, when you're renting you 'don't like to say 'We want this. We want this''.

Ron learnt about the benefits of energy efficiency mainly from the television program *A Current Affair* and then from personal experience. He's changed his lighting to CFLs and had ceiling insulation installed. Energy efficiency is a way he can manage his energy expenditure. The challenges he faces include the differing energy needs and habits of himself and his housemate and the ducted gas heating that is expensive to run.

Bill savings can be difficult for householders to accurately assess. Ron felt his energy and water bills were potentially reflective of the malfunctioning hot water service. He was hoping to save roughly $200 on his bills as a result of the changeover. Ron reports his gas and water bills have come down, noting however, the water bill saving is unclear because of credits he's receiving due to previous overcharging.

Ron's view is that hot water is something that's essential, without which you risk becoming sick. He enjoys a hot shower and thinks hot water does a better job than cold for washing clothes.

The main benefit for Ron has been 'Peace of mind. Peace of mind.' Having an unreliable hot water service was worrying. He was particularly concerned that the system might break down outside office hours.

> Because when things don't work you get worried. If things are not right you leave it but in the end you just get more wound up. You've got to address it.

Ron found the HEEUP process worked well for him. From his point of view 'it was just common sense … a no-brainer', in the situation of an old hot water service being replaced at no cost and potential savings. The installation went smoothly and the system has been running perfectly since.

Unexpected costs halt upgrade

Jenny and Ian's story is an example of a HEEUP engagement that stalled at the point of installation for a changeover from gas storage to a solar gas system at a home in a rural town.

Central Victoria

Enviroshop recruitment

Joined December 2015

No hot water upgrade

The case is an extreme example of a common issue; extra costs that occur as a result of gas piping and specific site requirements. It highlights difficulties that can be encountered when working with an installer that wasn't one of the program's regular suppliers.

Jenny and Ian's story

Jenny and Ian had planned to install both solar PV and solar hot water as part of major renovations to their mid-Victorian era cottage in a central Victorian town. Ian is still working part-time and they wanted to upgrade for 'the planet' and to bring expenses down before they are on a fixed lower income.

Jenny explained 'We couldn't afford both so we opted to do the solar [PV] for the house'. They joined a bulk-buy for the solar PV but had received an unaffordable quote for hot water, when a friend in a nearby town told them about HEEUP.

With the HEEUP rebate, Jenny and Ian's out of pocket cost was going to be an affordable $1,800. The quote and site assessment included an additional $500 to upgrade a gas pipe. Jenny and Ian queried this because they'd recently had new gas pipes installed. They were told the pipe had to be larger than what was there and the BSL could cover this additional cost.

Jenny described the installation day:

> It was pouring with rain the day they came out. They weren't happy anyway and they asked where the gas line was. So they were umming and ahhing, and 'Oh this is difficult', so and on and so forth ... They went and sat in their truck for quite a while. Then they came back and said, 'We've been in touch with our boss and it's going to cost you another $1500 for the upgrade'. And I said, 'What, $2000 to upgrade the gas line?'

Jenny and Ian were left wondering whether the $1500 was a genuine expense or the installer was inflating the price because they didn't want the work. They were 'gobsmacked' and disappointed because the installer's original quote was carefully prepared. Jenny's experience highlighted an important issue; a communication gap between a supplier and a purchaser. Trust developed between the BSL and their primary installers overcome this in many cases, but couldn't be completely managed in all.

At the new price, the upgrade was unaffordable. The BSL was unable to contribute more and the installation didn't go ahead. Asked what their plans are now, Jenny said, 'We've just shelved it and we'll wait till that hot water service decides not to work anymore and then we'll revisit it'.

Trust in BSL facilitates engagement now and into the future

Ehsan's story describes a motivated, engaged, policy-aware consumer and citizen who was able to make a solar hot water purchase through HEEUP. It shows how trust in the BSL facilitated participation in the program and how word-of-mouth through extended families can engage otherwise hard to reach households. It also demonstrates a recommendation that was made by multiple households in the research; that solar PV should be a priority for energy efficiency programs targeting low income households.

North-western Melbourne

Hume City Council recruitment

Joined December 2014

Install January 2015

Instant gas to solar gas

Ehsan's story

Ehsan wants to try to reduce energy bills in his family of five. As a chemistry PhD and science teacher, Ehsan knows a lot about hot water energy consumption and efficiency and a lot about solar. He anticipates a 20–30% energy saving from the solar panels he has added to his pre-existing instantaneous gas system.

Ehsan did his own research on solar options, in addition to the information provided through HEEUP. The flexibility of the program to facilitate Ehsan's access to the hot water system he wanted, through the installer he wanted, was important to his involvement in the program.

HEEUP brought the changeover forward. If it hadn't been for HEEUP, Ehsan would have waited until his current hot water service needed replacing before he would have considered an upgrade to solar.

Ehsan is well connected as he works in a lot of community associations, but hadn't heard about HEEUP through these channels. He knew about the BSL because his daughter is involved in the BSL's Saver Plus program so he had a positive view of the BSL and knew they have programs for people on low incomes.

When the HEEUP information came to him from Hume City Council, he felt comfortable to respond and he wants to be on a mailing list to be alerted to any future BSL programs. Ehsan also applied to HEEUP for his father-in-law who doesn't speak English. He was able to facilitate his father-in-law's involvement in the program and found the process simple, easy and helpful. His father-in-law upgraded his instant gas hot water to a solar gas system.

Ehsan's family are water conscious as well as energy conscious. His water bills inform him his household is a lower than average water user for its size. This is despite their coming from Iraq where water is plentiful and there is not the same culture of saving water as in Australia.

Ehsan is one of five case study participants who recommended making solar Photovoltaics available to low income households. He conceives of energy efficiency and environmental sustainability as national goals in the context of needing to keep Australia clean with a rapidly increasing population. He believes there is greater need for solar PV than for solar hot water, because there used to be significant government support (high feed-in tariff) but now that people understand the benefits, the support is no longer available.

NILS loan provides simple affordable finance

Southeast Melbourne

AGL recruitment

Joined May 2014

Install August 2014

Gas storage to solar gas

Janet's experience of HEEUP is an example of a straight-forward upgrade in a sole person household. It shows how HEEUP was able to address the capital barrier to a solar upgrade for someone committed to renewable energy. For Janet, the upgrade was about the capital replacement rather than to save on bills.

Janet's story sheds light on the experience of HEEUP for someone who is energy-literate and also demonstrates the way a NILS loan with repayments through Centrepay could provide a simple affordable option for covering the upfront costs of the upgrade.

Janet's story

Janet responded to the HEEUP offer she received from her electricity company for a couple of reasons. First, she is 'a very firm believer in using renewable energy' and second, her gas storage hot water service was near the end of its useable life and she would face an expensive replacement. She was also aware that:

> [I] probably would not have been able to replace it with a solar one because they were so much more expensive than just replicating what was there

Switching to solar was key for Janet. Without that option she would have waited for the old system to fail and then considered what she would do at that stage.

The financial benefit for Janet was more about addressing the replacement cost, rather than the everyday savings of lowering energy bills. In fact, Janet wasn't sure whether every day savings would happen, given her hot water needs tend to go up during winter when there is less solar radiance.

Janet found HEEUP 'seamless … very easy … absolutely no problems with any of it'. She found the information she received from HEEUP interesting, but felt she already knew a fair bit about solar because she's had solar PV since 2009. Janet did additional research on the unit she'd been recommended. She wanted to verify she wasn't getting 'a Mickey Mouse hot water service by Jo Blow around the corner'. She found a stainless steel tank with a much longer lifespan and HEEUP was able to accommodate this modification to the proposed system.

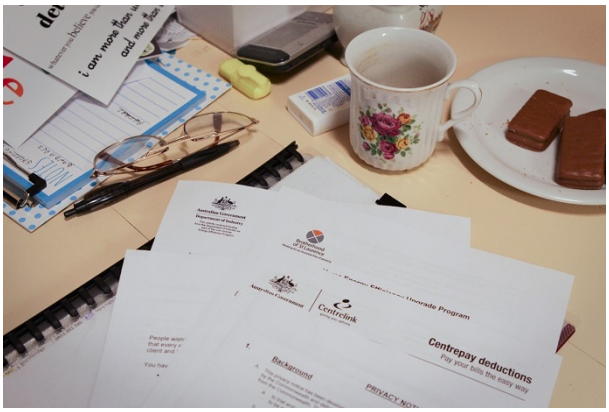
Janet also received a Home Energy Savings Scheme (HESS) visit. This was a requirement of accessing the HESS rebate that was available during the first three months of HEEUP.

The HESS worker thought Janet was 'doing a reasonable job in being as efficient as possible' and made a couple of suggestions that Janet chose not to act on. One was to cover the ceiling ducts from the old ducted heating system; Janet felt getting a plasterer to do this would cost too much. The second was to switch to a more efficient shower head. Janet explained:

> I have a very inefficient shower head, but it's great and I wasn't about to go into one of those miserable little things that drips water on you.

Janet is on a time of use tariff so she does high energy using activities, like running the washing machine, after 11pm when she pays the lowest rate. She receives the premium feed-in tariff and tries to sell most of the solar energy she generates back into the grid. Janet wants to change to a different energy retailer, but hasn't found one that will take her on as a customer because of the 60c/KwH FIT she receives.

To help pay for her upgrade, Janet took a $1200 NILS loan. There was a delay in getting this approved, but it was addressed after Janet followed up with the EEO. Without the NILS loan option, Janet said she might have tried to afford the upfront cost by paying with her credit card. She was aware that she was unlikely to get such a significant rebate again.



Having the loan repayments automated via Centrepay worked well for her and meant she didn't have to worry.

> It just came out of the pension before I ever got it so it wasn't there that I'm thinking 'oh have I got $50.00 this week'. That made it very simple and all right, maybe some fortnights I'd be down to the last five or ten dollars in the bank account by the time Wednesday night came but it was absolutely manageable, yes.

Janet has noticed a slight decrease her gas bill in summer, but not in winter. Overall HEEUP has had a relatively low impact on her finances. It had a bit of a negative effect while she was paying off the loan, but now that's paid off. The hot water is not quite as hot as it used to be, but Janet said she would have followed it up if she really needed to.

Hot water upgrade reduces energy consumption

Outer-eastern Melbourne

AGL emergency recruitment

Joined April 2015

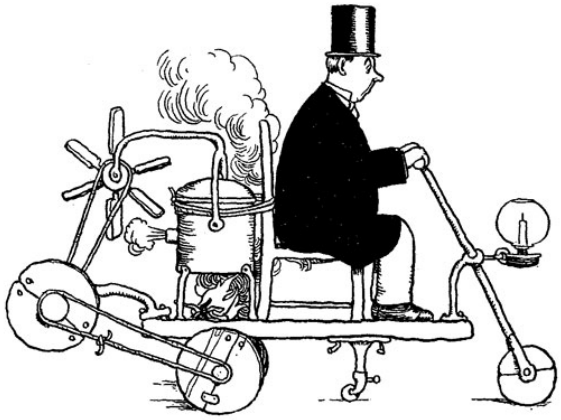
Install March 2015

Electric storage to solar gas

Bill's case study describes the impact on energy consumption, expenditure and greenhouse gas emissions from a changing fuel mix in the home. It also shows how HEEUP was able to replace an old unreliable system that had placed an additional burden on a carer. It provides an example of how a referral through AGL worked to bring down the cost of a solar upgrade in an emergency changeover. It also highlights the influence of the energy retailer on the householder's knowledge of and interest in, solar hot water.

Bill's story

Bill contacted AGL, his energy provider, to talk about changing his 50-year-old, unreliable hot water service. He'd had a lot of problems with it overflowing and described it as 'a very Heath Robinson effort' [18].



A WELL THOUGHT OUT AND NEARLY SUCCESSFUL EXPERIMENT BY EARLY RAILWAY PIONEER

Source: W Heath Robinson (undated)

With ongoing problems, **Bill and his wife were beginning to worry about the viability of the system** and were frightened of the problems 'going too far'. They decided it had to be replaced as soon as possible. They'd never thought of solar hot water and originally thought they might change to an instantaneous system.

18 The name 'Heath Robinson' became part of common parlance in the United Kingdom for complex inventions that achieved absurdly simple results following its use as services slang during the 1914–1918 First World War (Wikipedia, undated)

Bill said his decision was swayed by AGL who were 'very keen' on solar and then further by his friends who had solar and thought it was a good proposition.

Bill is the primary carer for his wife who has a chronic illness. This means he has taken on much of the running of the home. **Ensuring the reliability of the hot water service is one of the things they thought would help in their situation.**

A simplified analysis of the change in energy consumption, expenditure and greenhouse gas emissions is provided here for illustrative purposes;

Bill changed from an off-peak electric storage hot water system to a gas-boosted solar unit. Bill thinks his electricity bill has gone down as a result. Factors influencing energy consumption in this household are weather, the hot-water service replacement (26 March 2015) and the changeover of a highly inefficient gas oven to a new one. After the hot water service changeover, the weather was slightly milder on average: most comparison months recorded warmer minimum and cooler maximum temperatures and more solar exposure days than the year before. There haven't been major changes to the time Bill and his wife spend at home.

Comparison of eight months energy consumption data for 2014 and 2015, provided by Bill's energy companies, confirm his view that his electricity bill has gone down. There was a small increase in gas consumption and his electricity consumption almost halved, leading to a slight decrease in energy use overall (Table 17).

Table 17 Energy consumption

	Mar to Oct 2014	Mar to Oct 2015	Change	% change
Gas (MJ)	28167.35	31036.81	2869.46	10.19
Elec (KWh) – controlled load off peak[(1)]	1707.98	163.13	-1544.85	-90.45
Elec (KWh) - peak	1339.20	1318.13	-21.07	-1.57
Elec (KWh) - total	3047.18	1481.26	-1565.92	-51.39
Total gas + elec (MJ)[(2)]	39137.21	36369.36	-2767.85	-7.07

1. Hot water system was controlled load off-peak
2. 3.6 MJ/KwH

These figures were used to estimate changes to energy expenditure and GHG emissions.

As Table 18 shows, the increase in gas expenditure was offset by the saving on electricity mostly from the reduction of off-peak expenditure to zero after March 2015. This led to a 30 percent net saving on consumption costs.

Table 18 Energy expenditure estimates (consumption only)

	Mar to Oct 2014 ($)	Mar to Oct 2015 ($)	Change ($)	% change
Gas [1]	535.29	582.00	46.71	8.73
Elec – controlled load off-peak [2]	375.76	35.89	-339.87	-90.45
Elec peak [3]	372.83	366.97	-5.87	-1.57
TOTAL	1283.88	984.86	-299.02	-30.37

1. Consumption entered into Vinnie's Tariff Tracker July 2014 (Johnson 2016a)
2. July 2014 price ($0.22/KwH) (Johnson 2016b) applied to 2014 and 2015
3. Client provided price ($0.2784/KwH) applied to 2014 and 2015

The changeover made an important difference to the GHG emissions of Bill's household's energy consumption (Table 19). The shift from electricity to solar and gas for heating water has led to an estimated 37 percent decrease in emissions in the pre to post-intervention comparison period.

Table 19 Greenhouse gas emissions (kg CO2-e)

	Mar to Oct 2014	Mar to Oct 2015	Change	% change
Gas [1]	1442.17	1589.08	146.92	10.19
Elec[2,3]	4113.70	1881.20	-2232.49	-54.27
TOTAL	5555.87	3470.29	-2085.58	**-37.54**

1. Gas coeff - 0.0512 (AGDE 2014) 2. Elec coeff 2014 - 1.35 (ESC 2014) 3.Elec coeff 2015 - 1.27 (ESC 2015)

REFLECTIVE PRACTICE

Summary of results

Key program lessons identified in the reflective practice include the following.

Nature of support

- **Subsidies should be provided on a tapered basis.** That is:
  - a higher level of subsidy should be provided to those in energy hardship or fuel poverty who cannot afford to co-contribute
  - the subsidy level should be higher for solar and heat pump, and lower for less efficient, less costly options such as gas storage
- **Detailed in-home advice should only be provided to those who need it**: Many households need Independent, in-home advice; however, such advice shouldn't be provided to those who have already decided on the upgrade they want.
- **Community housing providers are keen to participate and provide economies of scale.** Public housing providers may also benefit from access to a program like HEEUP.

Flexible, tailored approach

- **Use diverse referral pathways to maximise uptake**.
- **Tailor the approach:** It is essential to understand the needs of different client groups, which may reflect demographic factors, location and tenure.

Trust, communication and engagement

- **Build trust with participants**: Trust in the organisation, the staff and the information provided and the suppliers is essential to engage participants and achieve upgrades to more efficient systems.
- **Understand and engage with the participants' motivations**, which include avoiding breakdowns, saving energy and money, and helping the environment.
- **Keep it simple for households**: Simple clear communication is essential for engaging householders.
- **Promote good engagement:** Staff are critical to the success of engagement with participants and subsequently the success of the program

Systems and processes

- **Reflect and improve:** Ongoing reflection, adapting and refining are essential, as is continuous improvement of the delivery processes.
- **Develop IT systems early in the program and modify them as needed.**

- **Mechanisms to control price are essential:** Bulk procurement agreements could further reduce costs

Introduction

Four reflective practice sessions took place during the HEEUP program. This process was undertaken as a continuous improvement practice for the program delivery team and other BSL staff. The sessions provided a space for all program staff to reflect on what was working well and wasn't working. They also provided an opportunity to record changes as they took place. A series of changes arose from the reflective practice processes.

Data

This section of the report draws on the reflective practice sessions and project management team meetings outlined below.

Participants in the reflective practice sessions included energy engagement officers, administrative staff, and program managers. These sessions were generally facilitated by the HEEUP program manager. The topics discussed at each meeting reflected the program issues at the time. All participants were encouraged to share openly about their experiences in the program.

A note taker was identified for each meeting and notes from the sessions were circulated afterwards. Participants were advised that information from the sessions would be used to improve the program, included in Milestone reports to the Department and in the annual or final report as appropriate. Participants were asked to identify any specific comments they didn't want reported.

The reflective practice sessions included here are:

Reflective practice 1 (RP1): Undertaken in July 2014, the first reflective practice session involved the program manager (facilitator), the energy engagement officer and BSL research manager for HEEUP. It focused on the in home process.

Reflective practice 2a and 2b (RP2): This included the HEEUP Energy Engagement team reflective practice workshop in early April 2015 and a reflective session with the HEEUP Project Management in March 2015.

Reflective practice 3 (RP3): Undertaken in October 2015, the session included the program manager, four energy engagement officers and the administration officer.

Summary of sessions

Lessons from the various reflective practice processes are summarised below. Where they resulted in a modification to the program process it is also identified.

HEEUP participants' views and motivations

EEOs reported their understanding of participant perspectives of the program. Participants:

- were quite unaware of their existing hot water system's energy requirements and its operating requirements
- were surprised by the level of financial and energy savings available from changing hot water systems
- had mixed needs for a loan. A considerable proportion of participants had some funds available to pay for the hot water system up front
- mostly had limited awareness of the different types of hot water system available, prior to the home visit
- had mixed levels of financial literacy. Some participants were very good money managers and highly financially literate.

There also appeared to be a high level of latent demand for the program. Clients reported they wanted to upgrade for a while but couldn't afford it or didn't have enough understanding of the best upgrade.

Avoiding a breakdown is a big motivator for those who get an upgrade (RP3[19])

EEOs reported that the majority of clients cite the age or risk of breakdown as the initial driver of a hot water replacement and an upgrade is seen to increase hot water reliability rather than to reduce energy consumption and costs.

Role of home visits

Home visits are essential for some households; however, others do not need them (RP3)

Home visits are an intensive engagement approach and the EEOs spent a lot of time engaging each participant (around 1 hour later in the program) and travelling to the visits. EEOs estimated that the home visits helped around 50% of households make their upgrade decision. Many of the other 50% already knew what the type of upgrade they wanted.

Future programs should use multiple and concurrent pathways to connect with the households including home visits, phone, email and mail should also be used.

Building trust and engaging participants

EEOs reported that building trust is essential to the success of the program.

Factors the EEOs identified as helping build trust include: the EEO has a big ID tag, the client has a number of contacts with the BSL (phone, letter), an appointment has been made and the client knows the EEO is coming, EEOs inform the client about hot water

[19] RP3 etc. identify the stage and session at which this issue arose

systems, the people need the service offered (a hot water upgrade), and the use of official DoI (DIIS) and BSL logos.

Specific points in the home visit that help engage the clients include:

Starting informally

A successful engagement is one which recognises the characteristics of the client (demographic and others) and tailors their engagement accordingly. It is important to be both relaxed and professional and if necessary build rapport by discussing topics outside the program (e.g. AFL, pets, etc). It is also good to begin the home visit by asking if the client has questions about the program process, as they generally do.

Varying the pace to the client's needs

During the home visits it is important to vary the pace of delivery to respond to the client's specific information requirements and ensure they understand of each program element and what is required of them.

Clients value the community service organisation motivations

Clients respond positively to the community sector's motivations and to BSL's commitment to programs like HEEUP. Physical assessment of the hot water unit with clients reinforces the EEO's expertise.

However, some clients can be sceptical of the program particularly if there are commercial partners involved.

Many people are brand loyal to their electricity retailer.

This was surprising and suggests a possible benefit of co-branding the mail out with the retailer.

Some factors were identified, which may impact on trust.

Gender of the EEO may be a factor in trust in hot water related advice (RF3)

One female EEO reported that many of the households expected the adviser would be male. She reported that a small number of clients did not perceive female EEOs to be knowledgeable in this technical area.

Trust may be an issue in approaches that are not face-to-face (RF3)

EEOs identified that when phone calls are used instead of home visits, building trust may be an issue. Households get a lot of calls from energy efficiency programs saying they are from the government. Many people are wary and concerned about scams.

Participants in financial and energy hardship (RF3)

Some people are in real hardship and have no hot water (RF3)

EEOs reported that a small number of those visited appeared to be in extreme hardship. Some households had no working hot water system. For example, one EEO reported a

client with three dependent children, whose sole income was the pension and who had very limited ability to fund her hot water upgrade.

In general these households have a hard time replacing their hot water system. NILS and the BSL program can work for some of these households but not all. People living alone face a particularly high cost burden. .

People who drop out often aren't those in the worst situations (RF3)

EEOs reported that the people who expressed interest but dropped out were often people with children and a mortgage. With many competing priorities, hot water replacement wasn't at the top of the list.

Eligibility could be tightened, however this comes at a cost (RF3)

A small number of participating households who appeared to have more assets, and were more likely to pay upfront, may not have needed the support of the program. These households met the eligibility threshold for the program; however, the family home is excluded from the assets test for concession eligibility).

Eligibility requirements could be tightened to rule out some of the asset rich clients. However, this might be time-consuming. The current arrangement is simple and fast.

Varied levels of support would be useful (RF3)

The variation in need even within low-income households – between those with very limited financial means and those who are better off – indicates that a tiered approach to subsidies may be suitable. Such an approach may involve a higher subsidy for those households with high needs and a lower subsidy for those with lower needs.

Working with a retailer

Program managers reflected on the value of working with an energy retailer. Positives included the ability to recruit concession clients (data and collateral) and access to metering data. Working with a retailer also provides potential for working further with energy hardship and at risk clients.

Key challenges included working with a large organisation with many departments (and varied objectives).

Working with community housing[20]

The engagement with housing providers was highly productive both in terms of the ease of circulating the offer details through the sector and the resulting administrative effort required by the BSL. By enlisting the maintenance function of each provider, the BSL avoided repeated visits and contacts with residents as well as the paperwork of a home owner engagement. BSL payments to providers were dependent on them providing the necessary certification. The use of mainly electronic communication enabled both small and large scale uptake of the offer.

[20] Written reflection from Tony Robinson, BSL Financial Inclusion Senior Manager, in lieu of participation in the reflective practice sessions Feb 2016

The major challenge for housing providers was the rejigging of planned hot water system upgrades and, in some cases, the identification of funding that could be brought forward to take advantage of the offer.

The success of the community housing engagement appeared to be overwhelmingly related to the trust that existed between the housing provider and tenants.

Converting participants from a home visit to a hot water installation (RF2)

In early April 2015, EEOs and program management addressed a key problem in the program: while it had received a large number of expressions of interest, the conversion into installations had proved very difficult. The factors identified are discussed below:

Uncertainty about the out-of-pocket expenses put participants off

Under the BSL 1 and 2 subsidy formulation the participants were offered a fixed subsidy. However, the installation costs for the systems varied significantly depending on the specific dwelling and piping requirements. As a result, the participants' out-of-pocket expense varied.

To provide participants with more certainty on costs, the program manager placed a cap of $2,000 on all solar and $1,800 on heat pump installations (this was the BSL 3 subsidy).

Systems were unaffordable (cost, subsidy amount, fortnightly repayments)

In RF2, EEOs also expressed concern that participants were unhappy with the cost of the hot water systems (with or without a loan). Program staff identified that a lower out-of-pocket household expense would reduce attrition and increase installation rates.

RF2 identified the following factors influencing system price: supplier costs, subsidy amount, system chosen (e.g. solar or instant gas), and the specifics of the home (including the previous system and additional piping requirements).

The following measures were introduced to reduce costs.

- Subsidy amounts were increased
- Additional suppliers were introduced: EEOs identified that some prospective participants had been put off because they believed they could get similar systems installed more cheaply by local suppliers.

Family dynamics often stopped upgrades proceeding

EEOs reported that within households there were often diverse views about preferred hot water systems, value for money, technology, aesthetic, operational requirements, and need. EEOs were sometimes able to resolve the differences; however, when disagreements could not be resolved the households did not continue with the program.

Some households did not need an upgrade

EEOs reported that a number of households that requested a home visit turned out not to need a hot water system upgrade. Many of these households had systems between 2 and 10 years old.

HEEUP informed these households of the options and provided an independent point of view that the upgrade may be unnecessary, and not cost effective.

Some households did not understand the offer

Some households did not understand the HEEUP program offer and believed it was providing a free hot water upgrade. When these households learned the level of co-contribution required many chose not to continue.

In response, the program staff sought to clarify the offer in written material and improve the intake process to reduce the chance that people receiving a home visit do not understand the offer.

Data and consent can be difficult (RF3)

A lot of people would not provide data if it were truly optional (RF3)

EEOs reported that a lot of people would opt out of allowing access to their data if it were an option. There is a lack of trust about what the data would be used for—sometimes even after the strict limitations on use of the data had been explained. Some participants were concerned that data might be used in reporting to other government department, or for some other purpose they hadn't consented to.

There are specific parts of the consent and data that are difficult (RF3)

The consent forms proved to be the most difficult points in the home visit as they require the participant to sign four times. The least effective questions were about attitudes to energy efficiency including its impact on personal freedom. These questions elicit bland responses because this group is unlikely to admit that they are not interested in energy efficiency.

Making recruitment and intake effective (RF3)

Creating a sense of urgency can increase uptake (RF3)

EEOs reported that a number of households had put off their decision on an upgrade until the program was closer to completion. Revisiting the HEEUP database (see section 1) provided an opportunity to prompt the undecided households.

Responding to participants promptly is important (RF3)

If too much time passes after the expression of interest, participants forget about the program or get it confused with other programs and are less likely to participate.

Many participants take time to decide whether they want a hot water upgrade (RP3)

Many participants were not ready to upgrade after their initial expression of interest or the home visit. This contrasted with others who made a decision prior to or at the home visit stage.

Program design issues

EEOs and Program managers identified that a number of the issues for participating households had their roots in the program design. These include:

Point of intervention in the market (RP2)

Program managers noted that HEEUP aims to encourage households to upgrade their hot water system prior to a break down situation. This allows the household time to assess the most cost-effective options (over the lifetime of the system).

However, the intervention point (prior to a breakdown) changes the type of purchase decision the householder has to make from an essential purchase or repair (to maintain a hot water supply) to a discretionary purchase.

The program was modified to incorporate some support for emergency replacements.

Barriers to multiple and diverse hot water installers (RP2)

HEEUP used a small number of preferred installers. While that approach had some benefits, it also came with limitations. In particular, some households wanted to use an alternative supplier for cost or other reasons.

The problems with a small number of suppliers suggest the need to utilise multiple suppliers. However, a number of contract stipulations and program design issues restricted the ability to do so. These included

- ensuring all consent and data processes are delivered
- ensuring all suppliers meet LIEEP's strict insurance provisions.

IT tools

Developing flexible and robust IT tools that can respond to the many needs in HEEUP was essential. This was particularly important for managing large numbers of EoIs and large volumes of data. It is easy to underestimate the complexity and importance of the IT platforms for this type of trial.