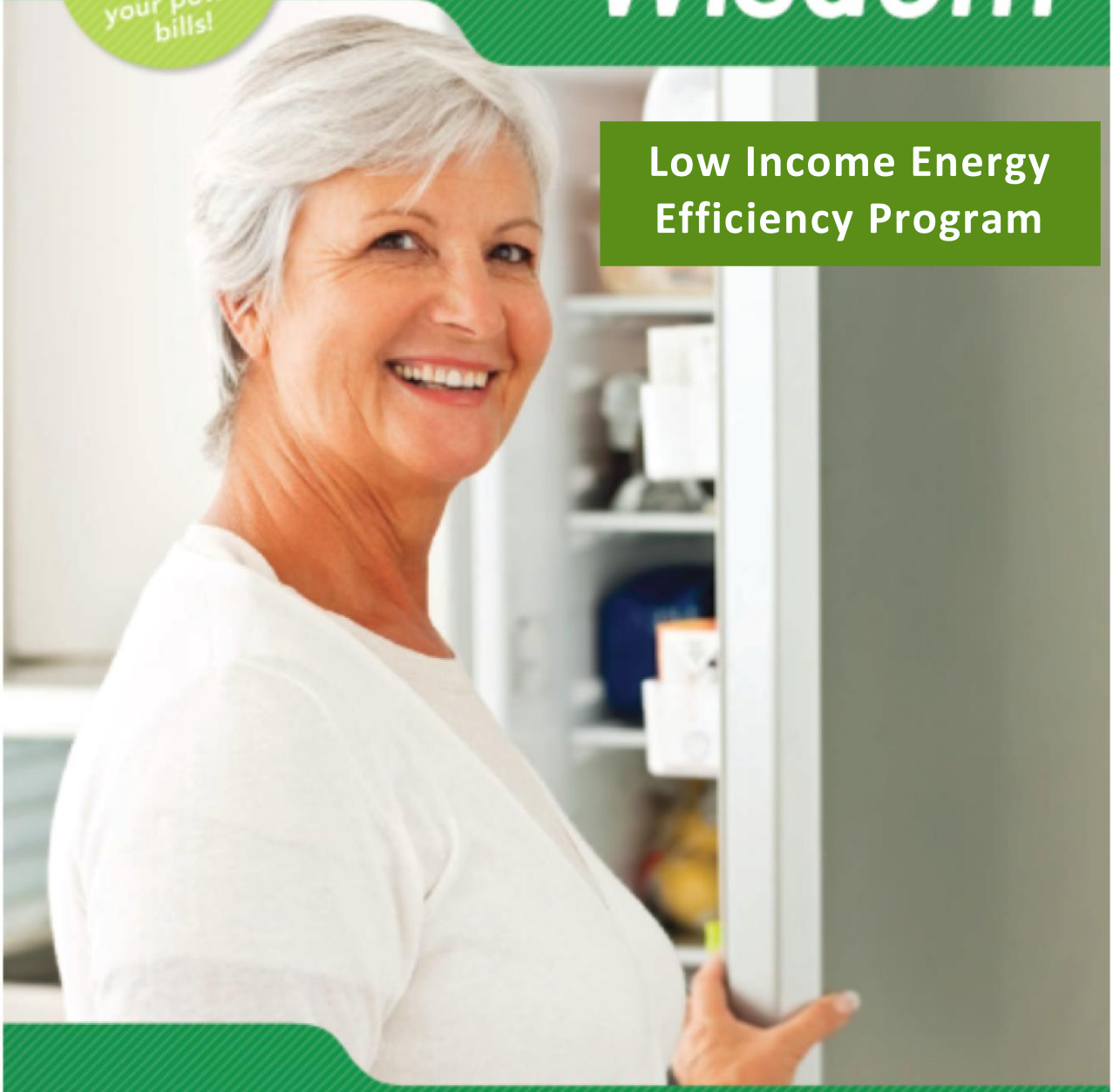
Green Heart Wisdom

Learn to save energy and manage your power bills!

Low Income Energy Efficiency Program



Australian Government
Department of Industry and Science

I ♥ BNE. That's why I am energy efficient.

Brisbane City

Dedicated to a better Brisbane

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This report has been prepared by Brisbane City Council for the Commonwealth Department of Industry, Innovation and Science. It summarises the findings of the Green Heart Wisdom Program, delivered by Brisbane City Council with funding from the Australian Government's Low Income Energy Efficiency Program.

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Acknowledgements

The Green Heart Wisdom (GHW) program was funded by the Australian Government's Low Income Energy Efficiency Program (LIEEP), which is administered by the Department of Industry, Innovation and Science. The GHW program was led by Brisbane City Council (Council) and involved a range of consortium partners. Thank you to the project partners that worked with Brisbane City Council to deliver the GHW program, including CSIRO, Community Service Providers, The Good Guys Capalaba, BoysTown, Good Shepherd Microfinance as well as peak bodies such as Council on the Ageing (COTA), National Seniors Australia and Australian Pensioners' and Superannuants League QLD Inc.

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Executive summary

This report summarises the findings of the Green Heart Wisdom (GHW) program, delivered by the Brisbane City Council with funding from the Australian Government's Low Income Energy Efficiency Program (LIEEP). In line with the broader goal of LIEEP - to trial and evaluate ways to assist low-income households to be more energy efficient - the GHW program focussed specifically on low-income senior householders in Brisbane. Senior householders are an important target audience as they are the fastest-growing demographic in the Brisbane City Local Government Area. The GHW program trialled two activities aimed at addressing the financial limitations and information failures that have historically prevented low-income senior householders from improving their energy efficiency.

The two activities trialled in this program were:

- **Home Energy Check (HEC)** – a trained field officer performed energy checks at 1000 participants' homes to make assessments and recommendations regarding the energy efficiency of fixtures and fittings. 628 participants also received a discounted energy efficient appliance upgrade to replace an old model and 920 participants received a discounted appliance upgrade and energy efficiency modifications, which were provided to participants whose homes met specific criteria[1].
- **EnergySavers sessions (ES)** – participants attended a series of group sessions, facilitated by a convenor, to discuss low-cost energy efficiency topics, using a format and materials tailored by CSIRO to low-income senior households. Due to recruitment challenges, some participants received the EnergySavers booklets only and did not participate in the group discussions.

To be eligible to participate in these activities, participants had to be aged over 60, live in the Brisbane City Council Local Government Area, hold a current Pensioner Concession Card, and own their home (mortgaged or outright) which was required to have an electricity meter. The program was successful at recruiting senior low-income householders to the program, attracting a total of 1647 participants. This success can be attributed to the effective partnerships forged between the Brisbane City Council, Community Service Providers (CSPs) and the other community organisations working with this target audience.

A suite of data collection techniques was integrated into the GHW program to assist in a rigorous evaluation of the activities. These included pre-program and post-program surveys, the collection of energy meter data, and the collection of qualitative participant feedback. CSIRO, a research partner of the GHW Program, was responsible for analysing data collected during the program activities.

[1] be aged over 60; live within Brisbane City Council boundaries; hold a current Pensioner Concession Card; own or are paying off the home they live in and have a separate electricity meter.

There were four GHW program objectives:

- **Objective 1:** To test which of the trial activities - Home Energy Check or attendance at CSIRO EnergySavers sessions - had the greatest impact in terms of raising awareness and levels of understanding of energy efficiency, changing behaviour and attitudes towards energy efficiency, and changing actual energy consumption.
- **Objective 2:** To improve the energy efficiency of low-income seniors' homes and contribute to their health, well-being and ability to remain in their own homes.
- **Objective 3:** To help low-income seniors manage energy costs by better managing their energy consumption.
- **Objective 4:** To inform future local, State or Federal government energy efficient policy and program initiatives amongst this target population.

Summary of key findings:

- Australia's population is aging, so assisting seniors to successfully balance energy costs with comfort and well-being, should be an important component of broader governmental planning.
- Low-income senior households are traditionally low users of energy and even small reductions in energy bills are important, since low-income households spend approximately 10% of their disposable income on household energy costs, compared to the national average of 5%.
- Vulnerable, low-income households are greatly exposed to the rise in energy costs. The mitigated impact of likely future price rises in electricity is likely to become increasingly financially valuable over time, as electricity prices continue to rise.
- While the overall Green Heart Wisdom program showed a low cost-benefit ratio, the economic assessment of this program did not monetise the economic values for the broader community relating to social benefits, such as individuals staying in their homes for longer, health and well-being, reduction in medical costs and addressing isolation.
- Results show that Green Heart Wisdom had an overall positive impact on helping seniors to manage energy costs, as Home Energy Check (HEC) Comparison participants (ie those who completed surveys but did not receive an appliance upgrade or modifications) showed an increase in their energy consumption during the program period, resulting in an increase in energy costs and related carbon emissions. Participants who received a program activity did not similarly increase their energy consumption.
- For optimal participant recruitment and retention, home-based interventions may be preferable when targeting senior low-income participants. In the current program, the requirement for travel out of the home made some activities more difficult to deliver or to achieve participation.
- Across all criteria, the Home Energy Check had the largest impact. Participants who received a refrigerator upgrade and/or installed CFL lighting showed a significant reduction in energy consumption. Future programs seeking to provide energy efficiency modifications for low-income seniors should concentrate on provision of appliances that have a large impact on energy consumption.
- Strong partnerships between program facilitators, the target community, and service providers who had ties to the target community was an important element of the program. This combination of partners helped ensure the program model was developed to suit the needs of the audience and importantly to facilitate recruitment to the program.
- The program made it clear that it is hard to implement a 'one size fits all' approach. There was a huge variation between participants' health, capabilities, independence, mobility etc. Future programs should tailor recruitment to suit people's capacities, as this is particularly variable in this age group.

- There are benefits to participants above and beyond direct reductions in energy consumption costs, and these benefits need to be considered when developing energy efficiency programs. These include health and well-being improvements, thermal comfort and protection from rising energy costs over time
- Heating and cooling systems play an important role in providing participants with thermal comfort at home since they account for up to 40% of household energy consumption. Effective interventions for senior low-income householders should focus on the need for seniors to balance energy efficiency and reduced energy costs, with the need for thermal comfort in the home.

1 Introduction

This report presents the findings of an evaluation of the Green Heart Wisdom (GHW) program, which was led by the Brisbane City Council with funding received from Round 1 of the Australian Government's Low Income Energy Efficiency Program (LIEEP). The Australian Government contributed $2.012 million to deliver the Green Heart Wisdom research project, with a further $622,000 contributed by consortium partners. The GHW program involved a range of consortium partners, including CSIRO as the research partner as well as Community Service Providers, The Good Guys Capalaba, BoysTown, Good Shepherd Microfinance as well as peak bodies such as Council on the Ageing (COTA), National Seniors Australia and Australian Pensioners' and Superannuants League QLD Inc. The LIEEP aimed:

- to trial and evaluate a number of different approaches in various locations to assist low-income households to be more energy efficient;
- to capture and analyse data and information to inform future energy efficiency policy and program approaches.

In addition to the aims above, the program had the following objectives:

- to assist low income households to implement sustainable energy efficiency practices to help manage the impacts of the carbon price and improve the household's health, social welfare and livelihood;
- to build the knowledge and capacity of consortia members to encourage long-term energy efficiency among their customers or clients;
- to build the capacity of Australian energy efficiency technology and equipment companies by maximising the opportunities for Australian industries to participate in the projects.

Improving household energy efficiency is a priority for vulnerable, low-income households, which are greatly exposed to the rise in energy costs, as they spend proportionately more of their disposable income on energy consumption. Senior households - the fastest growing demographic in the Brisbane Local Government Area (Office of Economic and Statistical Research; Queensland Treasury, 2011) - are particularly exposed to energy costs as they are more likely to live in larger, older, energy inefficient housing stock (Hamza and Gilroy, 2011; Roberts, 2008), and may be less likely to invest in energy efficient technologies because they find the rate of return from energy improvements too low (Mills and Schleich, 2012). Developing energy efficiency programs targeted to low-income senior households is thus an important component in broader government programs aimed at improving household energy efficiency.

Within the broader LIEEP research program, the GHW program aimed to explore the current energy use and energy needs of low-income seniors, and to address the financial limitations and information failures that prevent low-income senior Brisbane householders from improving their energy efficiency. The program trialled two main activities which aimed at improving the energy efficiency of low-income Brisbane senior residents. The program activities were run from November 2013 to April 2014 (Pilot stage) and May 2014 to February 2015 (Main stage).

These activities involved home energy assessments, financial incentives and/or information provision as outlined below:

- **A Home Energy Check (HEC)** – a trained field officer performed an energy check at participants' homes using a HEC tool (a tablet loaded with program-specific software called 'Runabout') to make assessments of, and recommendations regarding, fixtures and fittings relating to energy efficiency.

Depending on specific criteria, participants may have received a highly discounted energy efficient appliance (fridge, washing machine, air conditioner*) and modifications.

- **CSIRO EnergySavers sessions (ES) –** participants attended a series of group sessions to discuss low-cost energy efficiency using a format and materials specifically tailored by the CSIRO to low-income senior households. Participants who were not eligible for a HEC activity received $50 in grocery vouchers for participation in the program.

*only for participants eligible for either the Medical Heating and Cooling Electricity Concession Scheme (QLD) or the Essential Medical Equipment Payment (FED).

Participants were allocated to one of seven groups based on the nature of their involvement in the program activities:

Activity	Description	Number of participants
Home Energy Check (HEC) Only	A trained field officer performed an energy check at participants' homes using software which collected participant data and subsequently recommended fixtures and fittings relating to energy efficiency. Depending on the criteria listed above, participants may have been eligible to receive: i) A range of modifications including: o installing ceiling fans o draft-proofing windows or doors o installing standby power controllers o installing compact fluorescent lamps (CFL) o installing light-emitting diode (LED) lightbulbs) o switching electric hot water system to an off-peak tariff o installing water saving showerheads o installing tap aerators. ii) A highly discounted, energy efficient appliance to replace an old model: o Option of a fridge, washing machine or air conditioner, depending on eligibility of each participant (cost of $125 to participants).	654 participants
EnergySavers (ES) Only	Participants attended a series of EnergySavers group sessions, facilitated by a convenor, to discuss energy efficiency, using a format and materials specifically tailored by the CSIRO to low-income senior households. Participants received $50 in grocery vouchers as a thank you for participating.	165 participants
HEC & ES	Participants received a Home Energy Check and attended the EnergySavers group sessions (as described above).	60 participants
HEC & ES Information	Participants received a Home Energy Check and were provided with the EnergySavers materials, but did not attend the group discussions.	286 participants

ES Information	Participants received the EnergySavers materials by mail, but did not attend the group discussions.	33 participants
Comparison Groups	Participants were not involved in any activities, but completed pre-program/post-program surveys to enable comparison with activity groups.	
HEC Comparison	Recruited by CSPs – undertook pre and post program surveys.	206 participants
ES Comparison	Recruited by Council – undertook pre and post program surveys.	243 participants

Key findings relating to Objectives

Green Heart Wisdom Objective 1: to test which of the selected activities had the greatest impact in terms of raising awareness and levels of understanding of energy efficiency, changing behaviour and attitudes towards energy efficiency, and changing energy consumption.

Across all criteria, the HEC activity had the largest impact. Results show that participants who participated in the HEC only and/or face-to-face ES activity self-reported higher levels of awareness, greater feelings of control and empowerment over energy consumption, as well as higher frequency of effective self-reported energy behaviours in the post-program surveys (when compared to pre-program surveys). However, self-reported attitudes and behaviour were not directly associated with participants' energy consumption post-program.

Across all activities, the program yielded an estimated average decrease in electricity consumption of 99.89 Kilowatt hours per year per person. Participants in the HEC activity (either alone, or in conjunction with ES Information) showed the largest decreases in electricity consumption, and this decrease was associated primarily with either a refrigerator upgrade or CFL lighting installation.

Green Heart Wisdom Objective 2: to improve the energy efficiency of low income seniors' homes and contribute to their health, well-being and ability to remain in their own homes.

Results show that the provision of a refrigerator upgrade and the installation of CFL lighting through the HEC activity did substantially improve the energy efficiency of low-income seniors' homes. Participant feedback received in the post-program survey suggests that many participants perceived that the home energy modifications received in the HEC activity contributed to an increase in their home's energy efficiency and their household's well-being.

While the installation of modifications such as ceiling fans would not necessarily reduce electricity consumption or costs, qualitative feedback received from participants shows that:

- Participants who improved the energy efficient use of heating and cooling appliances benefited from greater control over their energy consumption while maintaining thermal comfort;
- Some participants reported that ceiling fans and power boards contributed to improving their levels of comfort at home.

Thermal comfort contributes significantly to seniors' health and well-being[2] and this improved health and well-being should improve seniors' ability to remain in their own homes for longer.

Green Heart Wisdom Objective 3: to help low-income seniors manage energy costs by better managing energy consumption.

Across all activities, the program yielded a per person decrease in electricity costs of $29.37 per year, and a per person reduction in carbon-equivalent emissions of 80.91 kg per year. Aggregated across the 1198 participants, this equates to an estimated total saving of $35,184.52 per year in electricity costs, and a total reduction of 96.93 tonnes per year in carbon-equivalent emissions. Although these per person changes are small, anecdotal feedback from CSPs states that even small reductions in energy bills are important for low-income householders, who spend relatively more of their disposable income on household energy costs. (10% compared to the national average of 5%)[3].

Results show that the program was most effective in reducing household energy costs for participants who received a refrigerator upgrade and/or installed CFL lighting. This finding suggests that when offering appliance upgrades, the potential energy reduction embodied by different appliances plays a key role in influencing household energy consumption.

Results also suggest that the program had an overall positive impact on helping seniors to manage energy costs. While HEC Comparison participants, who did not receive an appliance upgrade or any home modifications, showed an increase in their energy consumption, participants who received a program activity did not similarly increase their energy consumption over the same period. This suggests that the program activities may have improved participants' capacity to control their energy usage.

Green Heart Wisdom Objective 4: to inform future local, State or Federal government energy efficiency policy and program initiatives amongst this target population.

Thermal comfort is a key area for improving the energy efficiency and comfort of low-income seniors. Interventions that encourage the energy efficient use of heating and cooling appliances are essential for improving the energy efficiency of low-income seniors' homes, as air-conditioning use becomes the norm. This conclusion is supported by program data which shows that:

- Home thermal comfort plays a key role in maintaining participants' wellbeing, with 70% of participants relying on heating and cooling appliances for thermal comfort;
- The penetration of air-conditioning in seniors' home appears to be increasing;
- Participants' baseline perceptions of thermal comfort shift once the household has access to air-conditioning;
- Participants were <u>not</u> using air-conditioners and/or heaters efficiently at the start of the program;
- Some participants were still reluctant to set air-conditioners and/or heaters to recommended temperatures at the end of the program;
- There may be a discrepancy between the typical advice of energy efficient experts regarding what constitutes 'ideal' energy efficiency behaviour, and the expectations of senior households regarding the use of their appliances for maintaining thermal comfort.

[2] (2002) Krieger,J. & Higgins, D., Housing and Health: Time Again for Public Health Action

[3] Data from the Australian Bureau of Statistics: 4670.0 - Household Energy Consumption Survey, Australia: Summary of Results, 2012.

Other studies, such as those undertaken by Berry et al., 2014; Howden-Chapman and Chapman, 2012; and Moore et al., 2016, have identified that energy efficiency upgrades can result in beneficial social outcomes in relation to residential thermal comfort, health and well-being. These are in addition to energy and financial savings.

In the studies undertaken by Moore et al. (2016), residents of housing project homes stated that their health and comfort was significantly improved due to improvements in the thermal performance of their dwellings.

In the studies of Howden-Chapman and Chapman (2012), householders stated that when insulation was installed in their homes (New Zealand) they experienced a reduced number of hospital visits in relation to respiratory and coronary conditions, as well as other health benefits. [4]

[4] References

Berry, S., Whaley, D., Davidson, K., Saman, W., 2014. Near zero energy homes - What do users think? Energy Policy 73, 127-137. Howden-Chapman, P., Chapman, R., 2012. Health co-benefits from housing-related policies. Current Opinion in Environmental Sustainability 4, 414-419; Moore, T., Strengers, Y., Maller, C., 2016. Utilising Mixed Methods Research to Inform Low-carbon Social Housing Performance Policy. Urban Policy and Research, 1-16.

1.1 Green Heart Wisdom partners and program suppliers

The Green Heart Wisdom program was delivered with the support and commitment of the Consortium Partners and the Program Suppliers listed below. Table 1 shows the roles of each organisation.

Table 1 Green Heart Wisdom Consortium Partners and Service Providers

NAME OF MEMBER	PARTNER OR PROVIDER	ROLE
Brisbane City Council	Consortium partner	Project management Partner coordination EnergySavers recruitment
CSIRO	Consortium partner	Research Partner Data analysis and reporting Development of EnergySavers model and materials
Community Service Providers	Consortium partners	Delivery of Home Energy Checks Recruitment of participants Coordination of home modifications Delivery of EnergySavers sessions (some CSPs)
BoysTown	Consortium partner	Delivery of new appliances and removal of old ones Recycling of old appliances
The Good Guys, Capalaba	Consortium partner	Provision of discounted energy efficient appliances (either fridge, washing machine or air conditioner)
Council on the Ageing (COTA)	Consortium partner	Advice and promotion of program
Australian Pensioners & Superannuants League	Consortium partner	Advice and promotion of program
National Seniors Association	Consortium partner	Advice and promotion of program
Good Shepherd Microfinance	Consortium partner	Access to No Interest Loans (NILS)
Energex	Service Provider	Access to NMI data to measure changes in electricity consumption
APA	Service Provider	Access to MIRN data to measure changes in gas consumption
Priority Group Australia (PGA)	Service Provider	Development of Runabout and ASAP software Training and ongoing software support
Q&A Market Research	Service Provider	Data management

1.1.1 BRISBANE CITY COUNCIL

In June 2013, Brisbane City Council received approval under Round 1 of the Australian Government's Low Income Energy Efficiency Program (LIEEP)to fund the Green Heart Wisdom program. The Australian Government contributed $2.012 million to deliver the research project, with a further $622,000 contributed by consortium partners. The purpose of the program was to engage with up to 2,000 eligible seniors to help them manage their household energy usage more effectively and reduce power bills.

The Green Heart Wisdom program was managed by Brisbane City Council's Green Community Initiatives team, which delivers environmental engagement programs to encourage residents, schools, and communities of Brisbane to make changes that help to make Brisbane a sustainable city.

The project directly supported Council's vision to reduce Brisbane's carbon footprint and help senior residents to make more sustainable lifestyle choices. The 'Green Heart Wisdom' title distinguished this project from other Council initiatives, with 'wisdom' defining both the target audience and acknowledging the knowledge and experience of this demographic.

The two year Green Heart Wisdom program helped low income seniors improve their energy usage by providing them with access to a range of services. This included energy saving workshops and personalised home visits. Some participants were eligible to receive a range of energy saving modifications, at no cost to them, as well as highly discounted energy efficient appliances such as fridges and washing machines.

Council, whilst engaging with participants to meet the program objectives, also partnered with the above listed Consortium members and service providers to deliver the program. In addition to delivering the energy efficiency activities to the participants the program also served to collect and analyse a significant quantity of data to better understand low income seniors' attitudes and behaviours with regards to energy efficiency. The first part of the report presents the results of this research. The information contained in the following section presents details regarding the roles of Council's partners, how the activities were structured and observations, lessons learned and future recommendations.

1.1.2 CSIRO

Brisbane City Council partnered with CSIRO to support two components of the Green Heart Wisdom project, firstly as the research partner and secondly to support delivery of the EnergySavers program. CSIRO had previously developed an energy efficiency behavioural change program, for low income households. It was determined that with some modifications this program could be used as a model for the behavioural change component of Green Heart Wisdom. CSIRO's role was to adapt and oversee the delivery of the EnergySavers program, design the pre and post program questionnaires and conduct post program focus groups with analysis.

CSIRO also adapted EnergySavers communications materials, that included magazines and video clips, for seniors living in Brisbane and managed the ethical aspects of the program, ensuring that all materials and processes attained ethical clearance before engaging with the Brisbane community. CSIRO also developed and delivered the Convenor training program and provided ongoing guidance.

As research partner CSIRO collated all the program data. This included:

- participant consent forms
- the eligibility Screener information
- pre-survey responses
- Home Energy Check responses collected via the Runabout software
- post-survey responses
- participants' energy use information from Energex or APA. This was provided in a format that aligned with the Australian Government's Low Income Energy Efficiency Program (LIEEP) data schema.

CSIRO was responsible for uploading this information to the LIEEP data portal. It is this data that has been used to report the results and analysis of the program included within this report.

1.1.3 Q&A MARKET RESEARCH

Q&A Market Research services developed a number of digital products to facilitate the collection of participant data and structured it in a format to reflect the Australian Government's LIEEP data schema for upload to the LIEEP data portal. Q&A Market Research, CSIRO and Council worked closely to ensure privacy requirements were adhered to and that a high level of data integrity was attained.

Q&A Market Research undertook the following tasks:

- development of the Call sheets used by the CSPs, EnergySavers and Comparison Group officers to record details of participants who had been contacted;
- management of the allocation of each participant's identification number through the Call sheets;
- development of the web based eligibility Screener which the Recruitment Officer used when contacting prospective participants to confirm that they met the necessary criteria to participate;
- transfer of the pre and post program surveys to web based products so that surveys could be completed online, reducing the amount of data input needed to collate the participants' responses;
- working with PGA to collate the data gathered from the Home Energy Checks so that it could be passed to CSIRO for upload to the LIEEP data portal;
- collation of participant consent forms for Energex to permit CSIRO access to participant energy use data;
- provision of weekly reports to the Green Heart Wisdom team, so progress against program milestones could be tracked.

1.1.4 PRIORITY GROUP AUSTRALIA

Council partnered with Priority Group Australia (PGA) to develop the Home Energy Check software application, known as 'Runabout'. Questions were carefully crafted so that a clear representation of the participant's energy behaviours could be recorded, with appropriate recommendations for improvement suggested.

Field Officers used a Samsung tablet that allowed them to access the pre-program survey, the Home Energy Check questions and the post-program survey, whilst in the participant's home. This process allowed data from the surveys to be collated by Q&A and data from the Home Energy Check to be stored in the PGA database, known as ASAP. Both sets of data were then passed to CSIRO for its analysis and final upload to the LIEEP data portal.

Runabout collected participant responses and based upon their responses made energy efficient recommendations. Green Heart Wisdom recommendations afforded participants up to 100 points or $390 worth of energy efficient products to be installed within the home, plus up to $200 worth of labour for electrical installation services.

The software allowed the Field Officer to discuss the recommended products with the participant, attain a signature so the person could receive the agreed products and then submit the order to the ASAP database. If an appliance was recommended, an email was sent to The Good Guys to manage the request.

Energy efficient product orders, paperwork for installation and invoicing were managed via PGA's tool, ASAP.

1.1.5 THE GOOD GUYS CAPALABA

The Good Guys Capalaba supported the development of the Green Heart Wisdom program throughout the application stage, providing extensive advice relating to energy efficient appliances and assisting Council in developing a list of appliances most suitable for the program. The Good Guys supplied the energy efficient appliances at a discounted rate and also provided training in their delivery and installation to the BoysTown young people who delivered the program.

The Good Guys had a demonstrated record of social and environmental philanthropy through their existing partnership with BoysTown, which involved providing old white goods for BoysTown clients to disassemble, recycle or repair, prior to passing them on to needy families.

1.1.6 BOYSTOWN

BoysTown is a not for profit organisation which works with marginalised and disadvantaged youth to help them improve their quality of life. BoysTown provides counselling, employment, training and education services for its clients to help them develop life skills. Through Green Heart Wisdom, BoysTown was able to offer young people highly valuable, real life, on the job work experience.

BoysTown was the delivery and logistics partner for Green Heart Wisdom. BoysTown was responsible for collecting the new appliances from The Good Guys, delivering and installing them in the participants' homes, removing the old appliances and disassembling them. The appliances were completely recycled, as was 100% of packaging.

1.1.7 ENERGEX AND APA

Energex Limited (Energex) is a Queensland Government owned corporation that builds, owns, operates and maintains the electricity distribution network in the growing region of South East Queensland.

APA Group (APA) is Australia's largest transporter of natural gas, delivering approximately half of Australia's annual gas use through its infrastructure.

During the program development and start-up phase, Energex provided advice and attended a CSP training session to train officers about PeakSmart air conditioners and connections to an off peak tariff.

Energex supported the program by providing access to National Meter Identifier (NMI) data and APA supported the program by providing access to Meter Installation Registration Number (MIRN) data. Participant NMI and MIRN data was made available to CSIRO for analysis.

1.1.8 GOOD SHEPHERD MICROFINANCE - NO INTEREST LOAN SCHEME

One of the major barriers identified as limiting the ability of the target audience to improve the energy efficiency of their home was capital constraints. This was particularly relevant in relation to purchasing new energy efficient appliances which can be a significant expense for a household on a set income.

In order to ensure that all eligible participants could receive a discounted energy efficient appliance an arrangement was drawn up with Good Shepherd Microfinance, which operates the No Interest Loan Scheme (NILS). Through this scheme individuals on low incomes are able to access small loans to assist in certain purchases.

As part of the Field Officer training, information was provided to Field Officers about the NILS program and how it works. Field Officers were encouraged to discuss the loan with participants when discussing the appliance purchase, and information about NILS was included in the participant manual.

1.1.9 COUNCIL ON THE AGEING (COTA)

COTA (Council on the Ageing) is Australia's peak seniors' body. Its prime objective is "to promote, improve and protect the circumstances and wellbeing of older people in Australia… particularly the vulnerable and disadvantaged."

COTA's experience in engaging with vulnerable older people and providing community education and awareness on health promotion issues, identified it as an organisation which could contribute to the objectives of Green Heart Wisdom.

During the development phase of Green Heart Wisdom, COTA staff provided some insights about the target audience and challenges to consider when engaging with seniors. COTA also supported the promotion of the program by advertising it on its webpage and Facebook page.

1.1.10 AUSTRALIAN PENSIONERS' & SUPERANNUANTS' LEAGUE (APSL)

The Australian Pensioners' and Superannuants' League Qld Inc (APSL) is a voluntary support, referral, information, advocacy and lobby group, supporting people who receive a pension or are living partly on superannuation funds. APSL provides a voice at local, state and federal levels of government on issues of importance to their client group. Council engaged with APSL to further communicate Green Heart Wisdom and recruit participants to the program.

1.1.11 NATIONAL SENIORS AUSTRALIA (NSA)

National Seniors Australia (NSA) is the country's largest organisation representing people aged over 50, with a membership of around 250,000. This not-for-profit, membership-based organisation provides economic and social benefits for older Australians. Council engaged with NSA to further communicate Green Heart Wisdom and recruit participants to the program.

1.2 Project delivery tools

Brisbane City Council partnered with CSIRO, Q&A Market Research and Priority Group Australia to develop processes and tools to collect participant paperwork and responses to the pre-program survey, Home Energy Check and post-program surveys. The Australian Government's LIEEP team developed the data schema defining the scope of data to be collected for the program. This schema and the data collection tools were then aligned to ensure that as much relevant energy efficient information per participant as possible could be gathered to deliver the LIEEP program.

In addition to data collection via the tools described in Table 2, participant energy use data for 12 months prior to the program and up to four months after the program was collated and stored within a master database. CSIRO used this data for analysis and uploaded it to the Australian Government's Department of Industry, Innovation and Science data portal for comparative analysis between the 20 projects funded under its LIEEP agreement.

Table 2 Green Heart Wisdom products and tools

GREEN HEART WISDOM PRODUCT	SUPPLIER	EXPLANATION OF USE
Recruitment Call sheet	Q&A Market Research	All recruiting officers (Brisbane City Council and Community Service Providers) recorded participant details in a Call sheet. This included times and dates of conversations, participant contact details etc. The participant was allocated an ID number to ensure all their data was de-identified.
Screener	Q&A Market Research	The Call sheet launched an internet based eligibility Screener. The Screener presented a script for the recruiter to follow, to confirm the eligibility of the participant and their interest in joining.
Pre-program survey	CSIRO	At the start of the program, participants completed a survey that collected data relating to their existing energy efficiency attitudes and behaviours.
ASAP	PGA	Community Service Provider Officers used software called 'ASAP' to manage the booking of the HEC participants, the product ordering and invoicing.
Runabout	PGA	Community Service Provider Field Officers used a tablet with a software program called 'Runabout' to gather data during the Home Energy Checks within the participants' homes. The data collected from the HEC was then transferred to ASAP for product ordering and invoicing.
Post-program survey	CSIRO	After engaging with the program, participants completed a survey that was used to re-assess their energy efficient attitudes and behaviours and identify any changes as a result of participating in GHW.

2 Trial Methodology

2.1 Marketing and communication strategies

2.1.1 DEVELOPING THE GREEN HEART WISDOM BRAND

The marketing and communications strategy was developed in consultation with delivery partners and Council's Corporate Communication team and focused on the objectives and key audiences of the project.

The 'Green Heart Wisdom' brand provided all delivery partners and participants with an identity and comradery that was strongly adopted. The brand was founded on the core values of trust, sharing, expertise and knowledge. The collateral reflected this with the image of a person who was representative of the audience, and featuring the well-known branding of Council's cleat and logo and the Australian Government logo (refer to appendix – A11).

Part of the success of the program delivery is credited to the professional brand image established by Brisbane City Council consulting with Community Service Providers and program participants. Through consultation, messaging and images were created that would help to engage elderly participants.

In addition to engaging the participants, it was found that they also referred the program to their friends, neighbours and family, with word of mouth identified as a key contributor to new participants' enquiries and registration. The success in the brand's development is reflected in the result of participants identifying as 'Green Heart Wisdom' participants.

2.1.2 MARKETING AND COMMUNICATIONS

Green Heart Wisdom was delivered within the Brisbane City Council Local Government boundaries, with a range of communication activities planned to target eligible residents. A key strategy was to work closely with seniors' organisations, including Community Service Providers, Community Interest Groups, peak bodies and the Seniors Enquiry Line, to establish a targeted recruitment process to identify eligible participants.

Green Heart Wisdom marketing and communication activities were implemented with three main goals:

- To recruit Brisbane senior residents to one of the Activities
- To raise awareness of the Green Heart Wisdom program and benefits to the participants and partnering organisations
- To share and promote the outcomes of the program.

The communication activities were customised for each of the program groups. For each Activity, except the Comparison Group, a Green Heart Wisdom branded participant information pack that included details about the program, plus the necessary forms was provided to each registered participant.

Participant information (such as folder shells, letters of welcome and 'Your Key Contacts') was produced so that the program partners' branding could also be added to any of the communication materials. Dual branding between Green Heart Wisdom and the CSP for the Home Energy Check and the combined Activity, and Green Heart Wisdom and CSIRO for the EnergySavers activity was a tactic used to promote the

integrity of the program, so that participants felt confident to engage. Including the CSP branding helped gain the trust of participants who were already receiving a CSP service.

In total a marketing and communications budget of $23,680.00 was expended. The breakdown by activity is listed in Table 3 below.

Table 3 Green Heart Wisdom expenditure

GREEN HEART WISDOM ACTIVITY	EXPENDITURE
EnergySavers Only	$8,080.00
Home Energy Check Only	$9,900.00
Home Energy Check & EnergySavers	$900.00
Home Energy Check & EnergySavers Information	$4,300.00
EnergySavers Information	$500.00
TOTAL	$23,680.00

Note: Values are rounded to the nearest $10.00

2.1.3 CAMPAIGN EVENTS

Development and re-enforcement of the Green Heart Wisdom brand was undertaken through three key events:

- The Pilot Launch

  The program was launched on 3 November 2013. Consortium partners were announced and public participation invited via a media release and Council's social media channels. Promotion was primarily via the Community Service Provider networks.

- Main Stage Launch

  This event was held on 24 February 2014 at City Hall, with all program partners in attendance. The Lord Mayor Graham Quirk and Councillor Matthew Bourke, Chairman Environment, Parks and Sustainability Committee, opened the main stage of the program and in their speeches demonstrated Council's commitment to Green Heart Wisdom and the value of the program.

- Thank-you Event

  Formal acknowledgement of partners and participants at this event, held on 19 February 2015, was preceded by a workshop to obtain feedback from Community Service Provider groups. Certificates were provided to CSPs, convenors of EnergySavers groups and consortium partners. A video summary of the program was presented, and copies (later) provided to CSPs and partners. Again, attendance by the Lord Mayor and Councillor Matthew Bourke, Chairman Environment, Parks and Sustainability Committee, demonstrated Council's commitment to the project.

2.1.4 ADVERTISING ACTIVITIES

In January 2014, Green Heart Wisdom social media posts to recruit participants to the program, were distributed via the following channels:

- Council's Facebook page

- Council's website
- Council's Twitter account.

A media release was distributed to traditional media outlets. Additional advertising space was purchased in the following newspapers, and communications materials were shared with partners for their recruitment campaigns:

- Advertising in Quest community newspaper (distributed free to 11 areas of Brisbane – reaching 480,000 residents – four adverts in February and four in March)
- Brisbane Seniors Newspaper – June 2014.

When participants telephoned Council to register they could be allocated to the activity that Council was recruiting for at the time - EnergySavers or Energy Savers Comparison Group.

Figure 1 demonstrates the relationship between the above stated media channels and Brisbane residents accessing the Green Heart Wisdom page on the Council website. In total there were 6,205 page views from the pilot launch in November 2013 to program completion on 30 June 2015 (refer Figure 1). The top referrers of web traffic during this time frame were largely from Google. This indicates that the promotional collateral used during offline channels, events and other media were large contributors to drive online web page visits. The analytics suggest that the URL was frequently typed directly into the browser or users linked directly from social media apps or other websites.

The spikes suggest that Quest advertising encouraged Brisbane residents to view the web pages during the three month advertising period and that there was some increase in page views from the Brisbane Seniors newspaper. The main stage of the program commenced early April, correlating with an increase in web page access. In addition to the media channels previously mentioned, CSPs also promoted the program via their channels by telephoning databases of prospective participants.

An additional recruitment drive commenced in August to engage participants with the EnergySavers program that was hosted at Brisbane City Hall.

In October, Centacare increased their promotional tactics. Many officers participated in letter box drops to help recruit participants to the Home Energy Check and EnergySavers Information Activity. Letter box drops were also carried out at this time to recruit participants to the EnergySavers Information Only group. The spike during October in Green Heart Wisdom page views reflects this.

In addition to running the Green Heart Wisdom recruitment adverts, some of the Quest newspapers also published information about the program to promote recruitment. An article in the Wynnum Herald reported Councillor Peter Cumming discussing the program. A spike in telephone calls from the Wynnum area requesting more program information or registration occurred at this time.

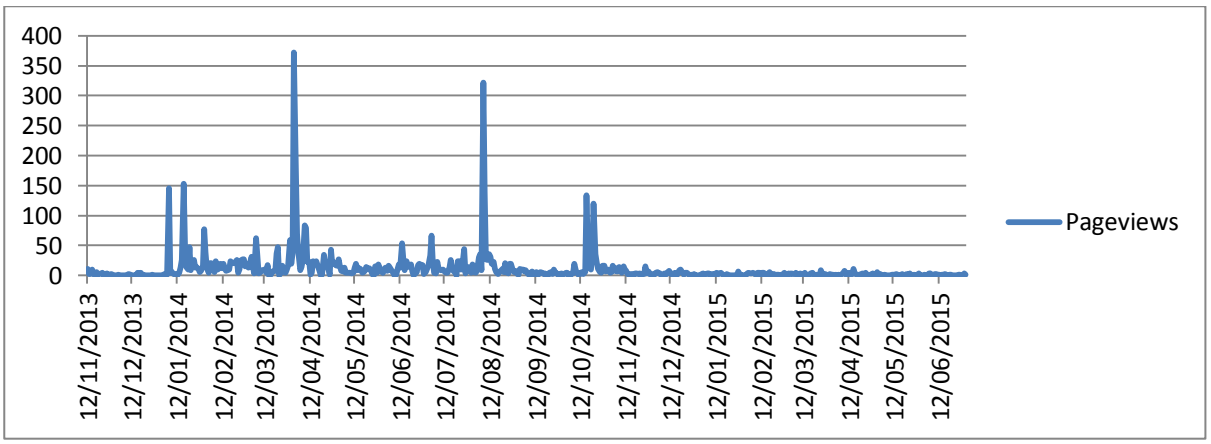


Figure 1 Page views to Green Heart Wisdom content on Council website

Additional marketing items such as Green Heart Wisdom branded binders, thermometers and magnetic calendars outlining program key dates were developed and distributed as reminders to encourage energy efficient behaviours by participants.

Since recruitment to the EnergySavers activity was slower than expected, Brisbane City Council hosted four large scale events at City Hall. Council advertised the events via subscription based databases. A webpage where participants could register for the event was also published on the Council web site.

EnergySavers and EnergySavers Comparison Group Activities were also promoted within the 'Your City Your Say' (YCYS) regular newsletters and monthly email.

2.1.5 PROGRAM PARTNER COMMUNICATION COLLATERAL

Green Heart Wisdom communication collateral was made available to all partners. The package included logos, recruitment adverts, media release, letterbox drop flyers and web site messaging that could be used to promote the program partnership. CSPs used this information within their printed magazines or web sites to further help increase registration.

BoysTown also designed a flyer that was included within the program information packs to communicate the social focus of the business and provide information about its sustainability measures of recycling old appliances. Investment in a printed sign for its delivery van also helped to further promote the program.

2.1.6 CONSORTIUM PARTNER CROSS PROMOTION

Consortium partners including COTA, APSL, NSA and NILS were invited to help promote the EnergySavers sessions. The partners were provided with an electronic flyer and invited to distribute this to their database. They were also provided with text for their websites and Facebook pages.

2.2 Sample population

To be eligible, participants had to be aged 60 or over, live in the Brisbane City Council Local Government Area, hold a current Pensioner Concession Card, and own their home (mortgaged or outright) which was required to have its own electricity meter.

Data collected through the program shows that the program was highly effective in reaching its target population, with 98% of participants reporting that they were aged 60 years or above and/or owning their home within the Brisbane City Council Local Government Area.

Detailed information regarding participant demographics can be found in Appendix A.2. Some key points include[5]:

- A higher proportion of females (73.5%) when compared to Brisbane population (54.7%)
- A higher proportion of participants aged 70 and above (77.2%) when compared to Brisbane population (49.7%)
    - The largest age group in the sample (41%) was the 70-79 years bracket.
- Rates of home ownership similar to Brisbane population:
    - Own home outright (81.7% of sample compared to 67.3% of Brisbane population)
    - Own home with a mortgage (15.9% of participants and 15% of Brisbane population)
- A higher proportion of participants with university degree (19.4%) when compared to Brisbane population (0.4%)
- Nearly one-quarter of participants chose not to disclose their household income. Of those that did, about 68.1% participants in all treatments managed their household on an income of $799 per week or less (under $41,599 per year).

2.3 Recruitment

Of the 3100 people approached to take part in the program, 1647 (53%) participated. As shown in Table 17 in Appendix A.1, the main reasons for non-participation were that people: were not willing to participate in the program (n=1263; 41%), did not comply with program requirements (n=116; 4% - for example, did not provide written consent for program participation), or did not meet eligibility criteria (n=62; 2%). In addition, Council has advised that from the 150 community groups approached, 29 participated in the program.

Recruitment of participants into the GHW program was undertaken by program partners with established links with the intended target population. The program used two recruitment approaches, one led by Brisbane City Council and the other led by Community Service Providers (CSP). Community Service Providers recruited participants to the Home Energy Check and Home Energy Check Comparison groups. Council recruited participants to the EnergySavers Only and EnergySavers Comparison groups.

For the Council-led recruitment, the Council dedicated a staff member to approach pre-existing community groups and invite their members to participate in the GHW program. For the CSP-led recruitment, CSPs used their client database records to call eligible existing clients and invite them to participate in the program.

The majority (52.9%) of participants heard about the GHW program through the designated recruitment agency (Council or the CSP). Participants also found out about the program through friends (12.1%) and family (2.6%). These results confirm previous research that indicate that word-of-mouth can be an effective way of recruiting participants into community programs (Romanach et al., 2013).

[5] Comparisons with Brisbane population based on 2011 Census for population aged 60 and above living in Brisbane City Council Local Government Area.

Survey data indicates that the biggest motivation for joining the GHW program was to reduce their energy bill, expressed by 42.3% of participants, with the next motivation being to improve home energy efficiency (14%).

A more detailed breakdown of participants' motivation for participation can be found in Table 18 in Appendix A.1.

2.4 Program activities

The GHW program was designed to trial two activities: the Home Energy Check (HEC) and the CSIRO EnergySavers program (ES). The program activities were run from November 2013 to April 2014 (Pilot stage) and May 2014 to February 2015 (Main stage).

2.4.1 HOME ENERGY CHECK (HEC)

Council partnered with CSPs to deliver the HEC component to program participants. Each CSP engaged Field Officers, who were trained by the program to conduct the HEC at the participant's home, using the software product "Runabout". This was developed by Priority Group Australia (PGA). Information regarding the participant's energy use and efficiency was entered into the software and recommendations regarding energy efficiency were made, based upon this information. Provided that participants met certain eligibility criteria, free energy efficient home modifications, discounted energy efficient appliances and suggested no- or low-cost actions were made available to them. The Field Officer discussed these options with each participant.

During the development phase of Green Heart Wisdom, analysis was undertaken to determine the types of modifications that would have the greatest potential benefit to senior participants, in terms of energy saving opportunities and improved thermal comfort.

Options available to the participant were:

- an appliance upgrade (a refrigerator, a washing machine[6] or an air-conditioner[7]); and/or
- modifications directly related to power usage and/or improving home comfort (installing ceiling fans, draft-proofing windows or doors, installing standby power controllers, installing compact fluorescent lamp (CFL) or light-emitting diode (LED) lightbulbs); and/or
- modifications related to power and water usage (switching electric hot water system to an off-peak tariff, installing water saving showerheads and/or installing tap aerators).

2.4.2 CSIRO ENERGYSAVERS PROGRAM (ES)

The CSIRO EnergySavers program was designed to provide low-income households with information on low-cost and easy to perform actions aimed to improve residents' energy efficiency behaviour and control over their energy use. To improve the effectiveness of the information provided, the CSIRO EnergySavers program was designed to be delivered through face-to-face group discussion, where participants were

[6] To be eligible for washing machine replacement, existing washing machines had to be fully functioning and built before 2004.
[7] To be eligible for air-conditioner replacement, participants needed to be eligible for the Medical Heating and Cooling Electricity Concession Scheme or the Essential Medical Equipment Payment. In addition, existing air-conditioners had to be fully functioning and built before 2007.

encouraged to discuss their own experiences within similar demographic or pre-established social groups to create a supportive environment for goal-setting and the formation of new normative beliefs.

Groups of around 10 people were invited to meet once a month for about two hours in a local venue (e.g. a local library). There were four sessions in total and meetings were facilitated by volunteer convenors who were trained and supported by CSIRO. Convenors facilitated group discussions using information, including video clips and take-home magazines, which was designed by CSIRO and specifically tailored to low-income senior households.

2.5 Program treatments

The GHW program was initially designed to test the HEC and ES activities by randomly assigning participants to three treatments:

- Home Energy Check Only (HEC Only)
- EnergySavers Only (ES Only)
- Home Energy Check and EnergySavers group (HEC & ES)

In addition, two control groups were planned, to help assess the impact of the HEC and ES activities. However, the program partners responsible for program recruitment were not able to implement this research approach. As participants were not randomly assigned to treatments, formal statistical control groups could not be established. Instead, two baseline treatment groups were established, in which participants only completed two surveys, with the aim of enabling a non-statistical comparison:

- EnergySavers Comparison group (ES Comparison)
- Home Energy Check Comparison group (HEC Comparison)

Feedback received by program partners suggests that the main barriers for random assignment were:

- **Program incentive**: CSPs responsible for recruiting participants felt uncomfortable randomly assigning participants into treatments that provided different levels of financial incentive. Due to this concern, CSPs agreed to recruit only to particular treatments. For example, a specific CSP might only recruit participants to the HEC Only treatment.
- **Client relationship**: Potential participants who learned about the program through 'word-of-mouth' often sought to join their preferred treatment, posing a difficult situation for recruitment agencies who did not want to jeopardise their client relationship by refusing such a request.

Recruitment was also affected by the location of the program activity (HEC and ES). The need to travel to a public place on set dates and time for participation in the ES activity proved a significant barrier for recruiting and retaining participants to this intervention.

In response to challenges associated with recruitment and random assignment, in August 2014, Council negotiated to include two extra treatments into the program, expanding the existing three treatments into five. The ES activity was modified so participants were provided with the information included in the ES activity at home (rather than via group discussions). Information was either posted to the participants (the

ES Information group) or delivered during their Home Energy Check (HEC & ES Information group).

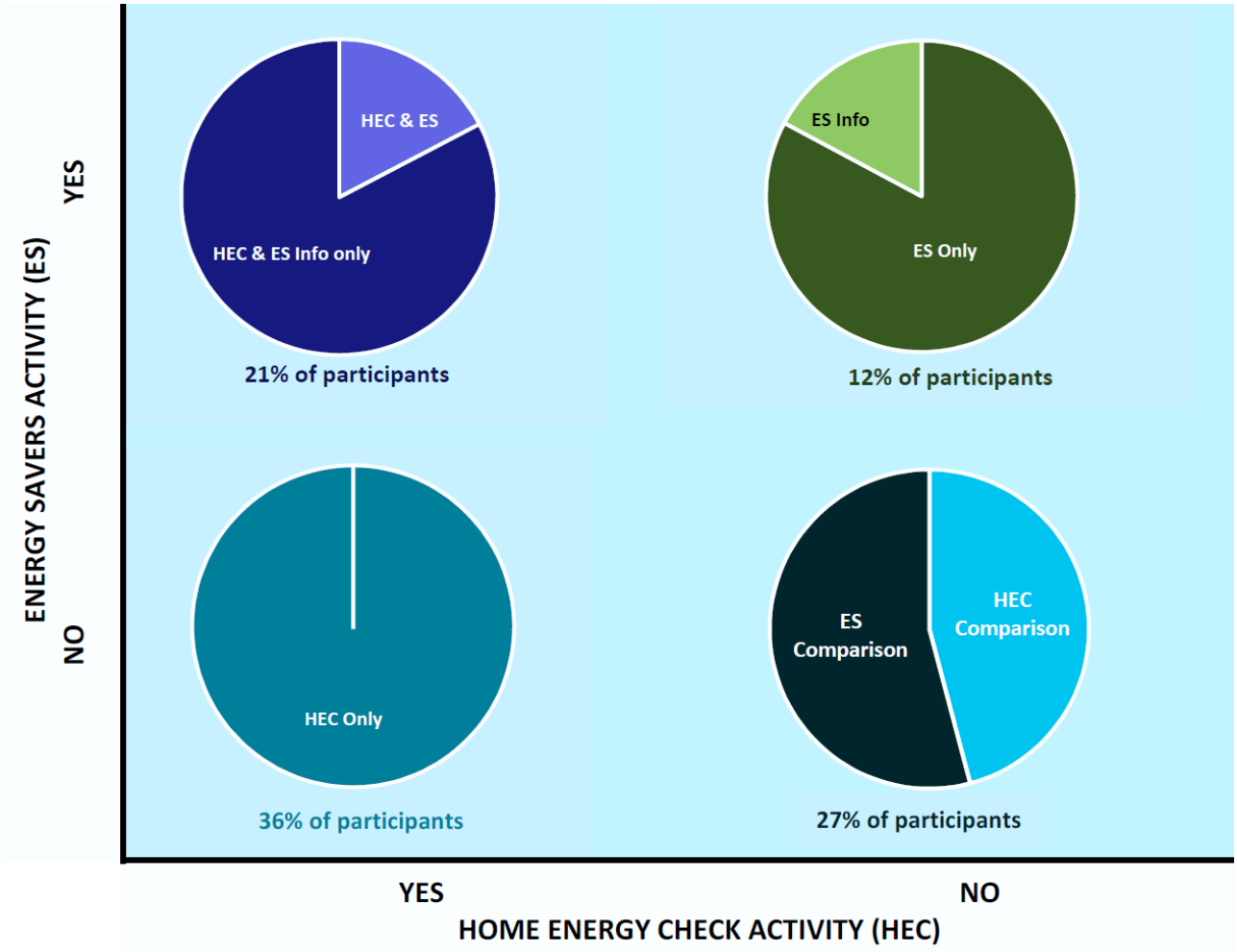


Figure 2 shows program activities offered within each treatment. Further information regarding the GHW program treatments, the responsible recruitment agency, location, and final number of participants is provided in Table 4.

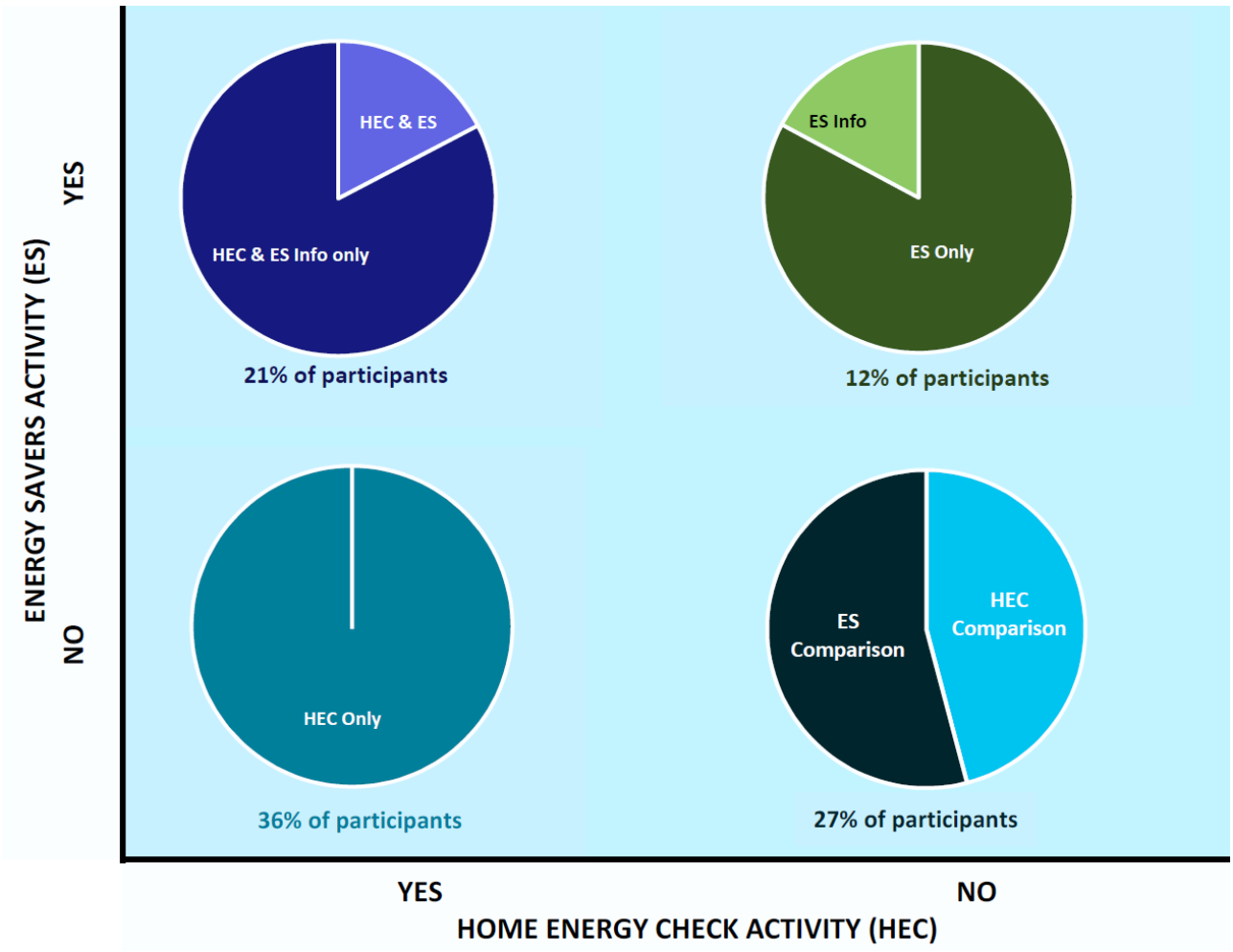


Figure 2 Green Heart Wisdom program treatments and related activities

Table 4 Summary of Green Heart Wisdom program treatments

TREATMENT NAME	TREATMENT DESCRIPTION	RECRUITMENT AGENCY	LOCATION OF ACTIVITY	COUNCIL MILESTONES			CSIRO DATA ANALYSIS		
				MAIN STAGE (N)	PILOT (N)	TOTAL	MAIN STAGE (N)	PILOT (N)	TOTAL
HEC Only	Receive a HEC and complete two surveys	Community Service Providers	Participants' home	605	56	661	600	54	654
ES Only	Attend up to four face-to-face ES sessions and complete two surveys	Brisbane City Council	Public space (i.e. library or community centre)	159	7	166	159	6	165
HEC & ES	Receive a HEC, attend up to four face-to-face ES sessions and complete two surveys	Community Service Providers	Public space (i.e. library or community centre) and participants' home	41	-	41	60	0	60
TREATMENTS ADDED									
ES Information	Receive four ES booklets by post and complete two surveys	Brisbane City Council	Participants' home	33	-	33	33	0	33
HEC & ES Information	Receive a HEC, four ES booklets and complete two surveys	Community Service Providers	Participants' home	300	-	300	286	0	286
COMPARISON GROUPS									
ES Comparison	Complete two surveys	Brisbane City Council	Participants' home	244	-	244	243	0	243
HEC Comparison	Complete two surveys	Community Service Providers	Participants' home	206	-	206	206	0	206
Total				1588	63	1651	1587	60	1647

Notes:
1. Efforts were made to recruit 500 participants for each of the three main treatments (HEC Only, ES Only, and HEC & ES). Due to recruitment challenges, two treatment variations were added in August 2014: ES Information and HEC & ES Information.
2. This report maintains the pilot data separately from the main stage data for analysis for three reasons: 1. there were significant changes to the program surveys after the pilot program was delivered; 2. the timeframe of data collection of pilot and main stage was extremely different, and 3. the sample size of the pilot treatments was very small, and therefore do not affect the program overall analyses.

2.6 Data collection

A number of agencies were involved in the data collection process, including Priority Group Australia (PGA) and Q&A Market Research. A summary of the data CSIRO received from four program partners and/or contractors can be found in Table 21 in Appendix A.1. The range of data collected within the program is discussed below, along with other relevant considerations.

ELIGIBILITY SCREENER

During the recruitment process, participants were screened for eligibility and invited to continue with the program. At this point, their contact details were collected.

PRE- AND POST-PROGRAM SURVEY QUESTIONNAIRES

Baseline measurements were incorporated into the methodology and therefore to allow for before and after analysis of the results, participants were asked to complete two questionnaires, one at the start of the program (after signing the consent form and prior to participation in any activity) and one at the end of the program (approximately four months later). The GHW program surveys collected data on participants' demographics, home energy usage, self-reported energy saving attitudes and behaviour.

Data collected in the program surveys was cleaned and submitted to the LIEEP Data Portal in .csv file format in accordance to the requirements of the LIEEP Data Schema v.1.3.1. For specific details of the tables submitted to the LIEEP Data Portal, please refer to Table 77 in Appendix A.9.

HOME ENERGY CHECK (HEC) DATA

A HEC tool (Runabout software) developed by PGA was used to collect information about participants' current home energy usage and behaviour. The HEC was administered in person by CSP field officers using a tablet-based questionnaire to individuals who participated in selected treatments (HEC Only; HEC & ES; HEC & ES Information). The field officer asked participants a range of questions, both quantitative such as number of CFLs and behavioural, such as the temperature at which they set air conditioner. Responses were collected on the HEC tool, and based on these responses energy efficiency recommendations were given to the participant. The responses and recommendations were then transferred automatically from the Runabout interface and stored within the PGA database. Q&A Market Research worked with PGA to collate this data into a suitable format and then forwarded it to CSIRO for analysis.

GAS AND ELECTRICITY CONSUMPTION DATA

The energy meter data collected included actual electricity and gas consumption data from Energex (electricity distributor) and APA Group (mains gas distributor). Participants were asked to provide consent for Energex and/or APA Group to provide CSIRO with their electricity and gas consumption data for a 24-month period (12-months prior to first contact, and 12 months after first contact). Therefore, CSIRO received the meter data directly from the relevant distributor.

Due to the actual program activities' timeframe, CSIRO received and analysed 6 months of post-program meter data for participants' electricity consumption in most cases. However, due to delays in recruitment for the HEC & ES Information group, CSIRO received and analysed only 3 months of post-program meter data for participants in this group. Gas and electricity consumption data was cleaned and submitted to the LIEEP Data Portal in .csv file format in accordance to the requirements of the LIEEP Data Schema v.1.3.1. Specific details of the tables submitted to the LIEEP Data Portal are specified in Table 78 in Appendix A.9.

CSIRO ENERGYSAVERS CONVENOR FEEDBACK

At the end of every CSIRO EnergySavers group session, convenors were asked to complete an online session evaluation to gather feedback on ES group attendance, to identify what went well and to note any challenges convenors faced during the session. There was also an opportunity for groups to send energy-related questions to CSIRO experts. CSIRO then provided the responses for convenors to share with participants prior to the start of the following group session.

POST-PROGRAM INTERVIEWS

In order to obtain participant feedback about the program, in January 2015 CSIRO conducted post-program telephone interviews with approximately 5% of participants. The 15-minute interview related to the program overall, and to the HEC and ES interventions in particular.

ETHICAL CLEARANCE

All data which was collected followed the processes specified in the National Statement on Ethical Conduct in Human Research (2007) and other relevant State and Federal legislative requirements, such as the Privacy Act 1988. The CSIRO GHW project team obtained ethical clearance from the CSIRO Social Science Human Research Ethics Committee (project number: 069/13).

MISSING DATA

As is typical in such large and complex evaluations, not all participants provided all possible data. Some people completed the pre-program survey but not the post-program survey; some people skipped questions within the survey; and energy consumption data could not be sourced for all households. On the whole, the proportion of missing data was low (in the range of 5-10%), but such cases must be excluded before statistical analyses are conducted. Therefore, the specific sample sizes reported in various figures and tables (in the body of this report and the appendices) are often somewhat reduced from the full sample reported above in Table 1. These reductions are not uniform, but depend on which measures are involved in each specific analysis. For example, analyses of changes in electricity consumption exclude those cases where consumption data is missing, but analyses of changes in attitudes include households with missing consumption data, but exclude households who did not complete both pre- and post-program attitude questions. Because rates of missing data were low, these minor variations in sample sizes for specific analyses have no substantive impact on the overall interpretation of the program.

2.7 Data limitations

As part of the data evaluation process, it is important to note the limitations imposed by the logistics of program delivery. Specifically, comparing the relative impact of specific GHW program activities must be done cautiously, for the following reasons:

- **Lack of random assignment to activities.** Participants in different activities were recruited by different agencies, so activity groups are likely affected by participant selection and allocation biases. Therefore, it was not possible to establish a formal statistical control group, as participants in the activities are not necessarily representative of the same population. However, two comparison groups who completed surveys but did not receive a HEC or ES activity were established. The HEC Comparison group and the ES Comparison group include participants who were recruited in the same way as the people in the HEC and ES activities respectively. For evaluation purposes, this report provides an analysis of the program impact on each of the five intervention and two Comparison groups, and results are compared descriptively between the different groups. Definitive causal conclusions cannot be drawn in these circumstances, so conclusions from data analyses are presented more tentatively, and should be validated by future research where participants *are* randomly assigned to treatments.

- **Different start dates between activities.** Different start dates affect the impact of activities on energy saving behaviour and consumption, as such factors vary seasonally. Analysis of energy consumption data controlled for seasonal variation by matching specific pre- and post-program time periods one year apart (when the seasonal effects were equivalent), but such controls were not possible for survey data.
- **Different program duration between activities.** Participants' post-program responses were influenced by the time that elapsed since the start of the intervention.
- **Different modes of data collection between activities.** The way survey data are collected can influence how people respond. For example, people often respond differently if they have assistance (or not) or are able to respond in private (or not). To illustrate:
    - Participants in the CSP-recruited activities responded to program surveys in an online format administered in person, or by telephone, by CSP field officers using a tablet-based questionnaire (HEC Only, HEC Comparison, and HEC & ES Information participants)
    - Participants in the Council-recruited activities responded to program surveys in hardcopy format, which they received from ES convenors and completed during the ES sessions (for ES Only and HEC & ES) or received by hand or mail (for ES Comparison and ES Information participants).

3 Key findings

The GHW program evaluation is based on the program's quantitative data collected through the participants' pre- and post-program survey questionnaires, HEC questions and modifications, and through the electricity and/or gas consumption data. Quantitative data was analysed using STATA, a statistical software package.

3.1 Objective 1: Impact of GHW program

This section responds to the GHW Program Objective 1, and tests which of the selected activities had the greatest impact[8] in terms of:

1. Raising awareness and levels of understanding of energy efficiency
2. Changing attitudes and behaviour towards energy efficiency
3. Changing energy consumption

3.1.1 RAISING AWARENESS AND LEVEL OF UNDERSTANDING OF ENERGY EFFICIENCY

Self-reported awareness prior to activity (pre-program):

The data collected in regards to the program indicates that, in general, participants already had high levels of awareness towards their own energy usage at the start of the program. For example, self-reported data collected in the pre-program survey shows that:

- 94% individuals stated high levels of interest in conserving energy at home
- 64% individuals felt they were in control of their energy bills
- 62% individuals felt empowered in relation to their own energy consumption

Change in self-reported awareness (pre-program and post-program comparison)

Despite the high level of awareness towards energy saving awareness at the start of the program, a number of individuals reported a significant improvement[9] on attitudinal measures between pre-program and post-program surveys.

As shown in Figure 3, positive change was identified regarding participants' self-reported awareness and sense of control and empowerment over energy use for those who received a HEC activity and/or participated in face-to-face ES group discussions. It is notable that these changes in perceptions do not align well with actual changes in energy consumption (where the HEC activity produced the largest actual changes). It is a common (and frustrating) finding in behavioural intervention work that people can experience perceptions of control/empowerment without those perceptions always translating into actual changes in behaviour.

[8] Please note data limitations discussed in Section 2.7.
[9] Improvement in measures as identified through the pair samples t-test analysis presented in Table 49 in Appendix A.4.

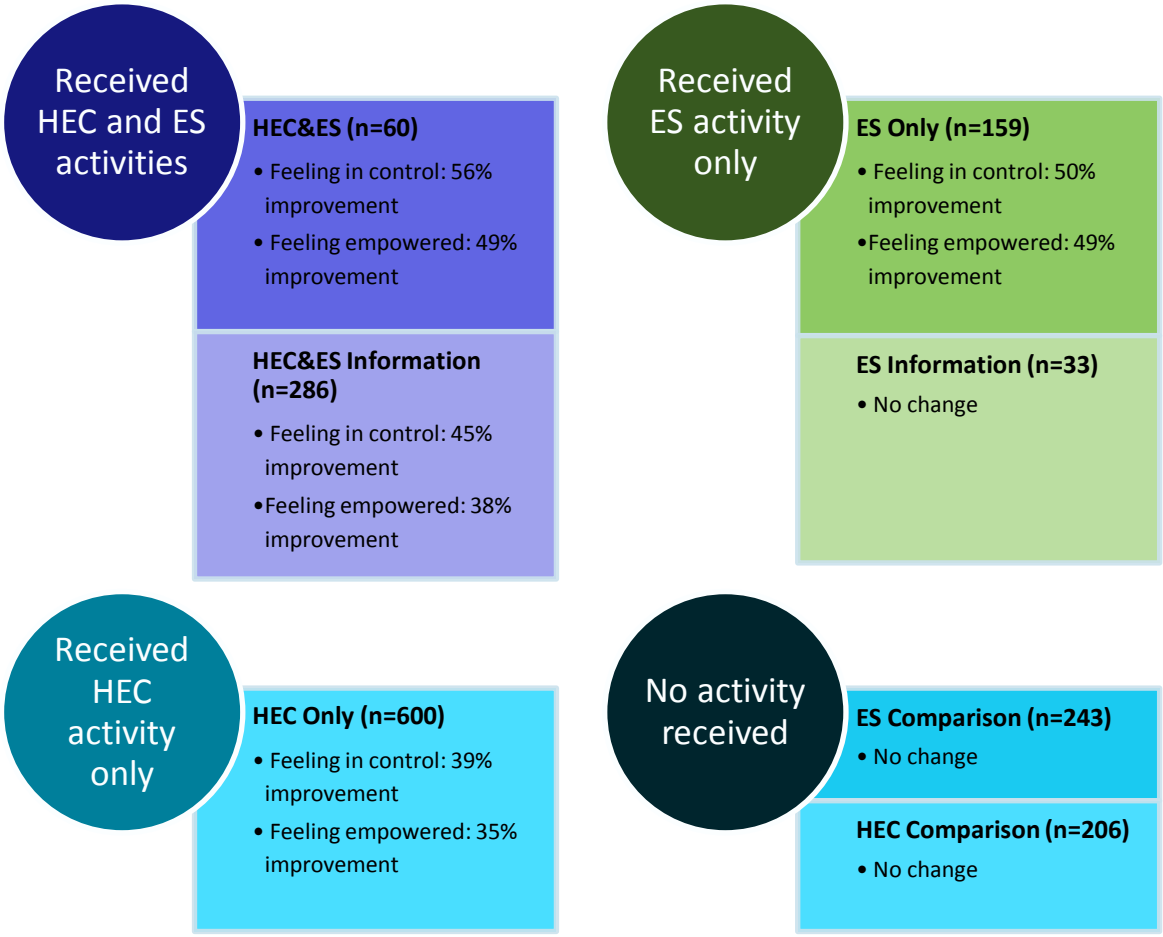


Figure 3 Change in self-reported awareness (pre-program and post-program comparison)

3.1.2 PRE AND POST-PROGRAM SELF-REPORTED BEHAVIOUR TOWARDS ENERGY EFFICIENCY

Most participants (75%) perceived their own behaviour as energy efficient at the start of the program. Indeed, Brisbane residents who participated in the GHW program reported that they were already engaging in many energy saving behaviours when they completed the pre-program surveys at the start of the program. In general, most participants in all treatments were already performing the following actions 'most of the time' or 'all the time':

Self-reported behaviour prior to activity (pre-program):

- Switch off the lights in rooms that are not being used (96%)
- Run the dishwasher with a full load only (88%)
- Use fans or natural ventilation for cooling the house (84%)
- Hang out clothes to dry naturally (84%)
- Run the washing machine with a full load only (84%)
- Wash clothes in cold water (83%)
- Shut blinds/curtains to reduce heat getting into/out of the home (77%)
- Close off areas that do not need to be cooled in summer or heated in winter (79%)
- Consider energy efficient ratings when buying new appliances (74%)
- Turn appliances and devices off at the power point (65%).

In addition, 83% of participants stated they 'never' or 'rarely' use a clothes dryer.

However, some types of energy saving actions were not frequently performed by a substantial number of participants at the start of the program. For example, most participants did not use their heating and cooling systems efficiently. Specifically, over half of the participants reported that they did not frequently set the air conditioning or heating systems appropriately. The recommended temperature for energy efficient use of cooling systems is 25°C or more in summer, while the recommended temperature for an energy efficient use of heating systems is 18°C or less in winter. As shown in Figure 4,

- 56% of participants who responded to this question stated they never 'set the air conditioning to 25°C or more in summer'
- 52% of participants who responded to this question stated they never 'set the heater to 18°C or less in winter'.

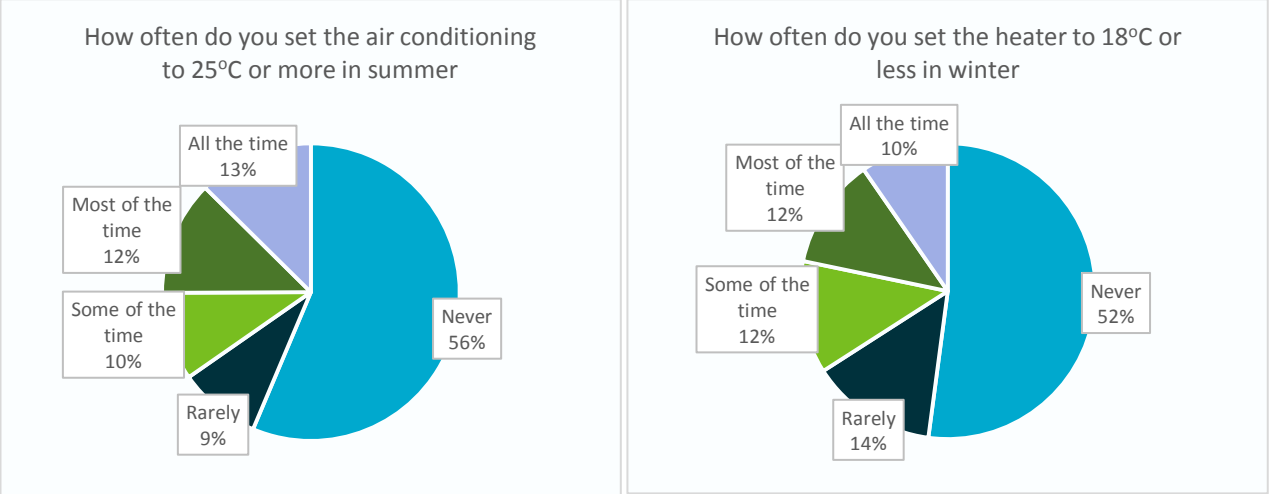


Figure 4 Participants' use of heating and cooling systems at the start of program

Data collected in the pre-program surveys also show that many participants did not frequently check their refrigerator for its energy efficiency. For example, self-reported responses at the start of the program regarding refrigerator use include:

- 67% of participants who responded to this question stated they never 'use a thermometer to check fridge and freezer temperature'
- 47% of participants who responded to this question stated they never or rarely 'check the seals of refrigerator for leaks'.

Change in self-rated behaviour (pre-program and post-program comparison)

A comparison of pre-program and post-program data identified changes regarding participants' perception of their own general energy consumption behaviour for some treatments[10]. As shown in Figure 5, despite already perceiving their own energy behaviour as 'efficient' at the start of the program, an improvement[11] on participants' perception between pre-program and post-program surveys was identified for those who received a HEC activity and/or participated in face-to-face ES group discussions.

[10] Based on the statement: 'How would you rate your energy behaviour in the last 2 years (pre-program)/four months (post-program)?'

[11] Improvement in measures as identified through the pair samples t-test analysis presented in Table 49 in Appendix A.4. Improvement percentage was calculated if t-test was significant and include participants who reported a higher level of rating in the post-program survey when compared to the pre-program survey.

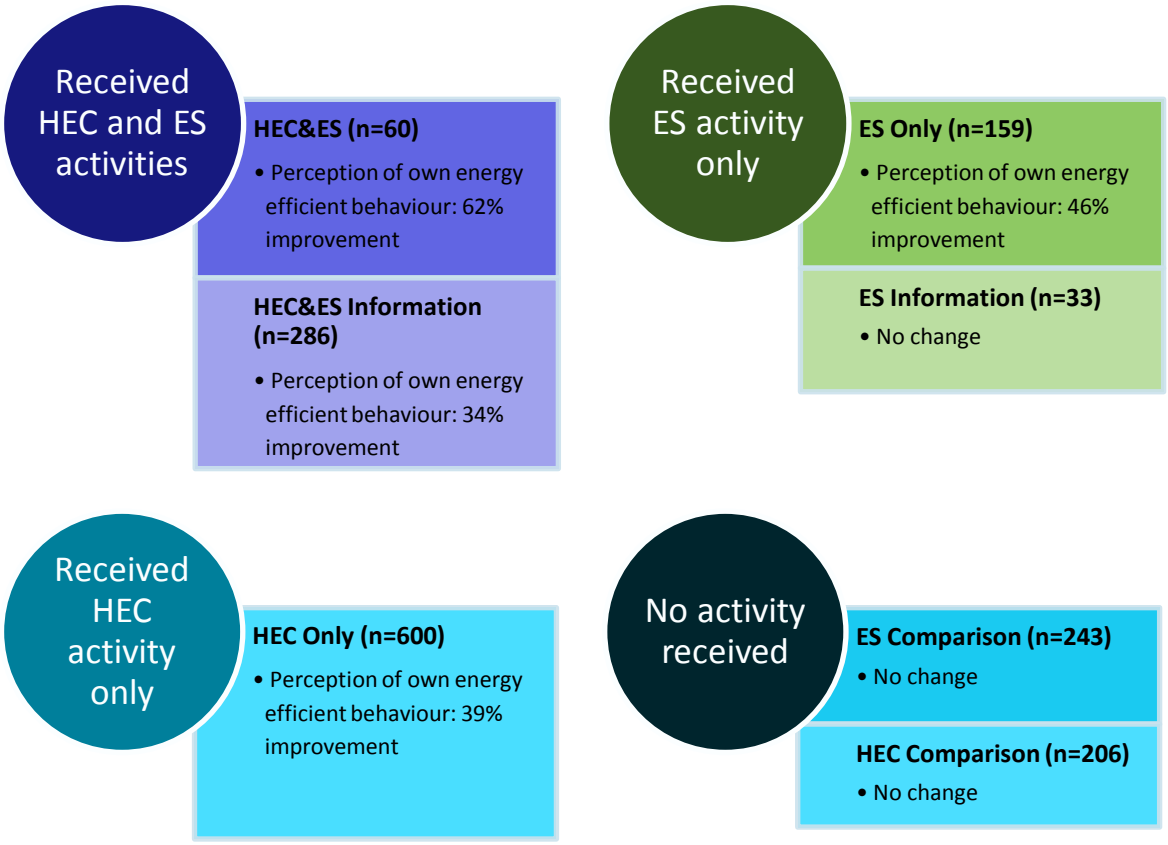


Figure 5 Change in perception of own energy behaviour (pre-program and post-program comparison)

Changes in energy efficient use of heating and cooling systems during the program are discussed in Section 3.1.3.

3.1.3 CHANGING ENERGY CONSUMPTION

Improving households' energy efficiency is fundamental for vulnerable households such as the elderly and low-income individuals, who are greatly exposed to the rise in energy costs, as they spend proportionately more of their disposable income on energy consumption. To understand the current energy needs of senior Brisbane residents, the program collected extensive data on participants' energy needs as well as actual energy consumption.

Household energy use prior to activity (pre-program)

Energy sources

Data collected in the pre-program survey shows that most participants relied solely on electricity for their energy consumption needs, with one third reporting the use of gas (mains or bottled) and 12% reporting the use of solar energy for water heating. This finding suggests that senior Brisbane households who participated in the program were more likely to have solar water for heating when compared to all Brisbane households, as about 8.4% of Brisbane households rely on solar water heating (Australian Bureau of Statistics, 2014).

Gas meter data was received from the mains gas distributor (APA Group) for 238 participants, which represents 72.6% of participants who stated they used mains gas (n=328) and 14.4% of participants overall. Results show that gas consumption is driven by the type of gas-driven appliances, as well as on household size. For example, as shown in Figure 6, households with a gas hot water system used considerably more gas than households with electric hot water systems. Gas energy consumption also increased with household size, especially in households that used gas for water heating.

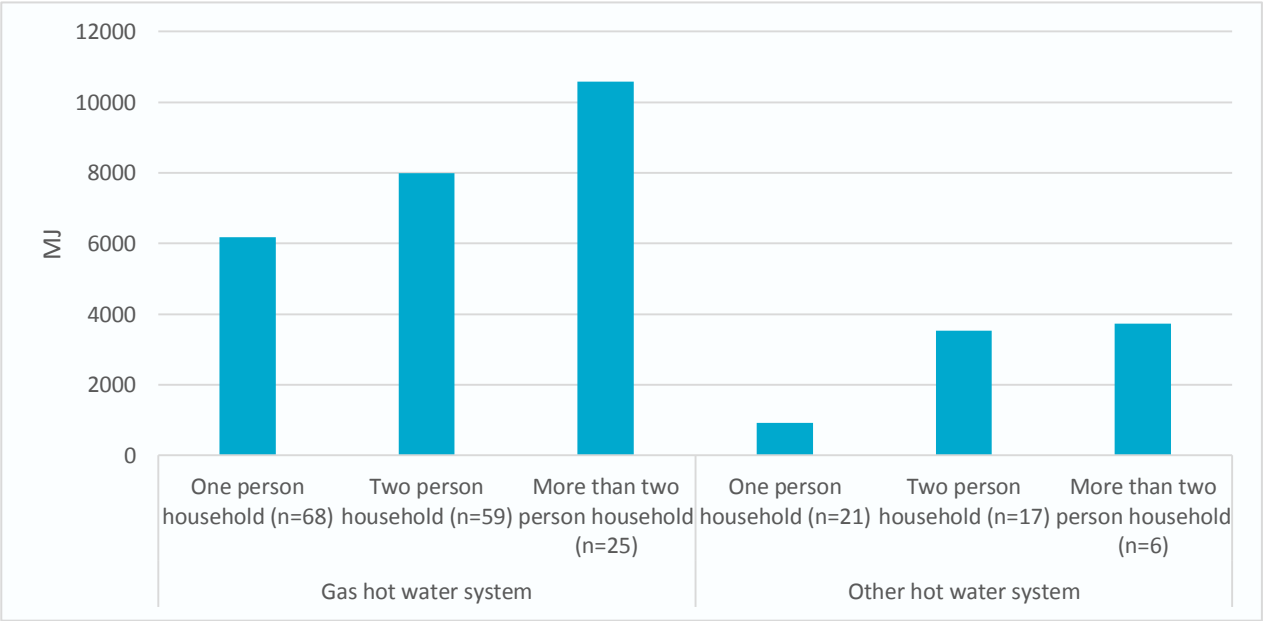


Figure 6 GHW household mains gas consumption from January to December 2014 (12-month-period)

Housing stock

Previous studies have highlighted the importance of engaging low-income seniors in energy efficiency programs, as they are particularly exposed to energy costs, given they are more likely to live in larger, older and energy inefficient housing stock (Hamza and Gilroy, 2011; Roberts, 2008). As shown in Figure 7, data collected in the GHW pre-program surveys confirms prior research, with results showing that over 75% of participants lived in homes with three or more bedrooms, and that the clear majority of respondents have more bedrooms than occupants[12].

[12] Percentage based on valid responses only (n=1377; 84% of all responses)

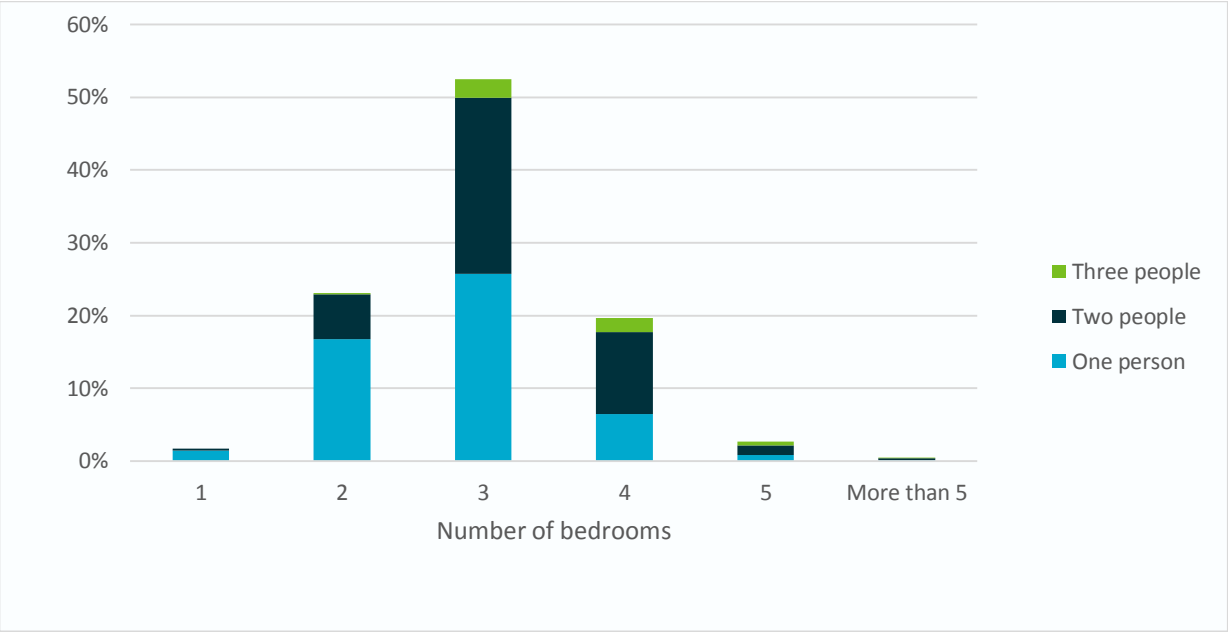


Figure 7 Number of bedrooms and household size

Pre-program survey data also shows that, within the program population, older residents tended to live in older homes. As shown in Figure 8, 27% of participants aged 90 years and above were living in homes over 60 years old, as opposed to 15% of those below 70 years of age and 16% of those between 70 and 79 years of age.

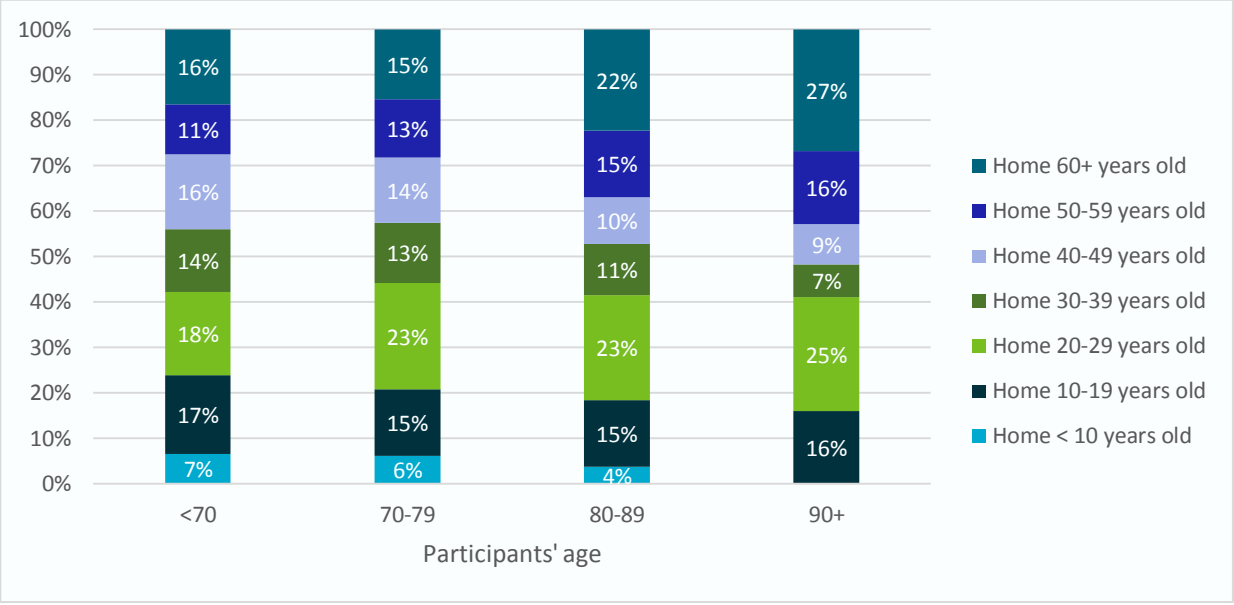
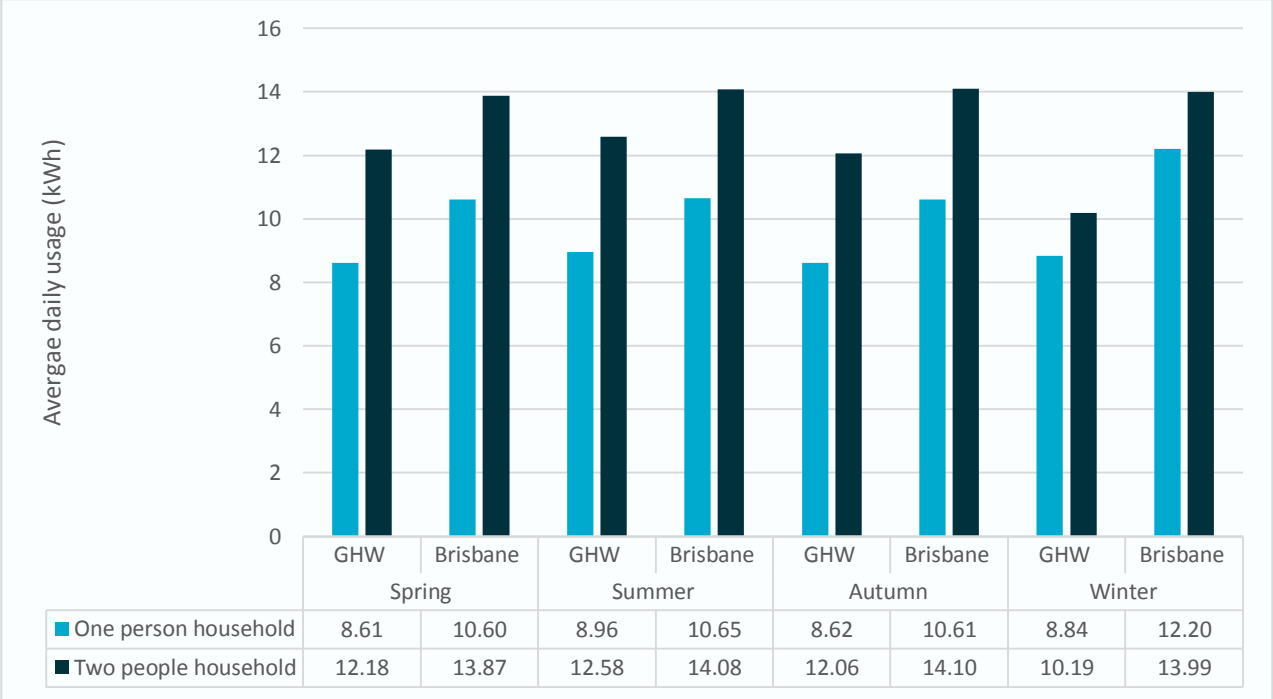


Figure 8 Age of homes according to participants' age (Pearson chi-square (18) = 34.6; p< 0.05)

Electricity consumption

Daily average electricity consumption data (pre-program intervention) from participants was compared with the daily average consumption of Brisbane residents. As shown in Figure 9, energy consumption of participants in our sample was slightly below the Brisbane average for both one person and two person households across all four seasons, indicating that, despite living in large and old homes, the energy consumption of program participants was lower than the Brisbane average.



	GHW	Brisbane	GHW	Brisbane	GHW	Brisbane	GHW	Brisbane
	Spring		Summer		Autumn		Winter	
One person household	8.61	10.60	8.96	10.65	8.62	10.61	8.84	12.20
Two people household	12.18	13.87	12.58	14.08	12.06	14.10	10.19	13.99

Figure 9 Household energy consumption before the start of the Green Heart Wisdom program[13]

Change in energy consumption (pre-program and post-program comparison)

Mains gas consumption

A comparison of mains gas consumption before and after the start of the GHW program did not find any statistically significant differences in households' consumption. These results are presented in the appendices, Table 72. It is noted that the relatively small samples of participants using gas makes it difficult to detect any substantive changes in consumption.

Electricity consumption

To identify changes in participants' electricity consumption, household consumption was compared before and after the GHW program activities for a six-month period (i.e. October to March 2013/14 and October to March 2014/15; please refer to Table 63 for statistical comparisons). These 6-month figures were then doubled to estimate an annual change. The analysis presented in Table 5 below indicates that, in general, participants who received a Home Energy Check (whether HEC Only or HEC & ES Information) showed a significant reduction in electricity consumption. However, this was not the case for participants in the HEC & ES group. It is important to note that electricity meter data was only available for 45 of the 60 participants in the HEC & ES group. The reduction in numbers for this already small group makes it more difficult to detect any statistically significant changes in energy consumption.

[13] Brisbane Average Data Source: http://www.energymadeeasy.gov.au/bill-benchmark.
Daily average consumption GHW program:
1. Spring (Sep to Nov 2013); n=453 (1 person household) and n=325 (2 people household)
2. Summer (Dec 2013 to Feb 2014); n=673 (1 person household) and n=568 (2 people household)
1. Autumn (Mar to May 2014); n=642 (1 person household) and n=545 (2 people household)
2. Winter (Jun to Aug 2014); n=270 (1 person household) and n=287 (2 people household)

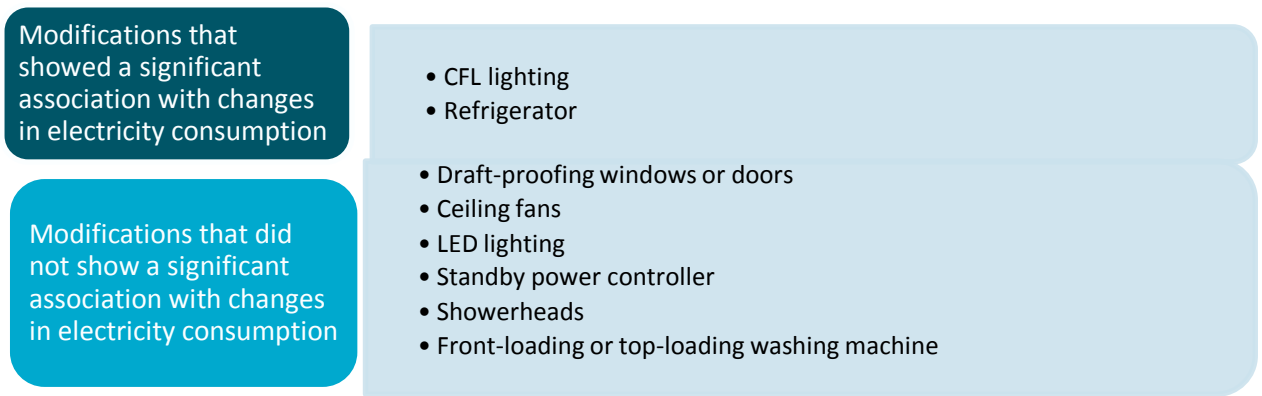
Participants who participated in an EnergySavers activity (or received the ES information without group discussion) did not show a significant shift in their electricity consumption. Results also show that HEC Comparison participants had a significant increase in electricity consumption during the same period. The Comparison groups were not true controls (because of the lack of random assignment), but this increase suggests that in the absence of the program activities, HEC participants may have been expected to increase their electricity consumption.

Table 5 Summary of changes in electricity consumption over the program

ACTIVITY	SAMPLE SIZE	STATISTICAL CHANGE	PER PERSON CHANGE IN ENERGY (KWH/YEAR)	TOTAL CHANGE IN ENERGY (MWH/YEAR)
HEC Only	654	*Reduction*	-109.20	-71.42
ES Only	165	*No change*	81.24	13.40
HEC & ES	60	*No change*	21.38	1.28
ES Information	33	*No change*	106.88	3.53
HEC & ES Information	286	*Reduction*	-232.38	-66.46
All Activities Combined	1198	*Reduction*	-99.89	-119.66
HEC Comparison	206	*Increase*	296.28	61.03
ES Comparison	243	*No change*	4.34	1.05

The figure below summarises what modifications showed associations with changes in electricity consumption. Many modifications did not show any significant association with reduced consumption, and this result probably stems from a variety of factors. Some modifications were of limited scope (e.g. LED lighting is usable in far fewer applications than CFL lighting). Other modifications require concomitant behaviour change for their value to be realised (e.g. draft-proofing is only effective at reducing consumption when areas in the house are routinely closed off).

Figure 10 – modifications received during HEC activity and changes in household energy consumption (6 month pre-program and post-program comparison).



Different numbers of program participants were involved in the different activities, and these activities had different impacts on their energy consumption. To gain a sense of the program's aggregated impact, the comparison groups were excluded (because they received no intervention activity), and the total impact on consumption of all activities was calculated. Across all activities, the program yielded a decrease in consumption of 99.89 Kilowatt hours per year per person. Aggregated across the 1198 participants in these groups, this equates to a total of 119.66 Megawatt hours per year of reduced electricity consumption.

To identify which of the specific appliance upgrade and modifications installed during the HEC were associated with changes in consumption, a regression analysis was conducted, including appliances and/or modifications that were installed in participants' homes. As shown in Figure 10 (and Table 64 in Appendix A.6), the installation of CFL lighting and the refrigerator upgrade were significantly associated with the energy consumption reduction amongst participants who received a HEC activity. Further details about home modifications received as part of the program are discussed in more detail below.

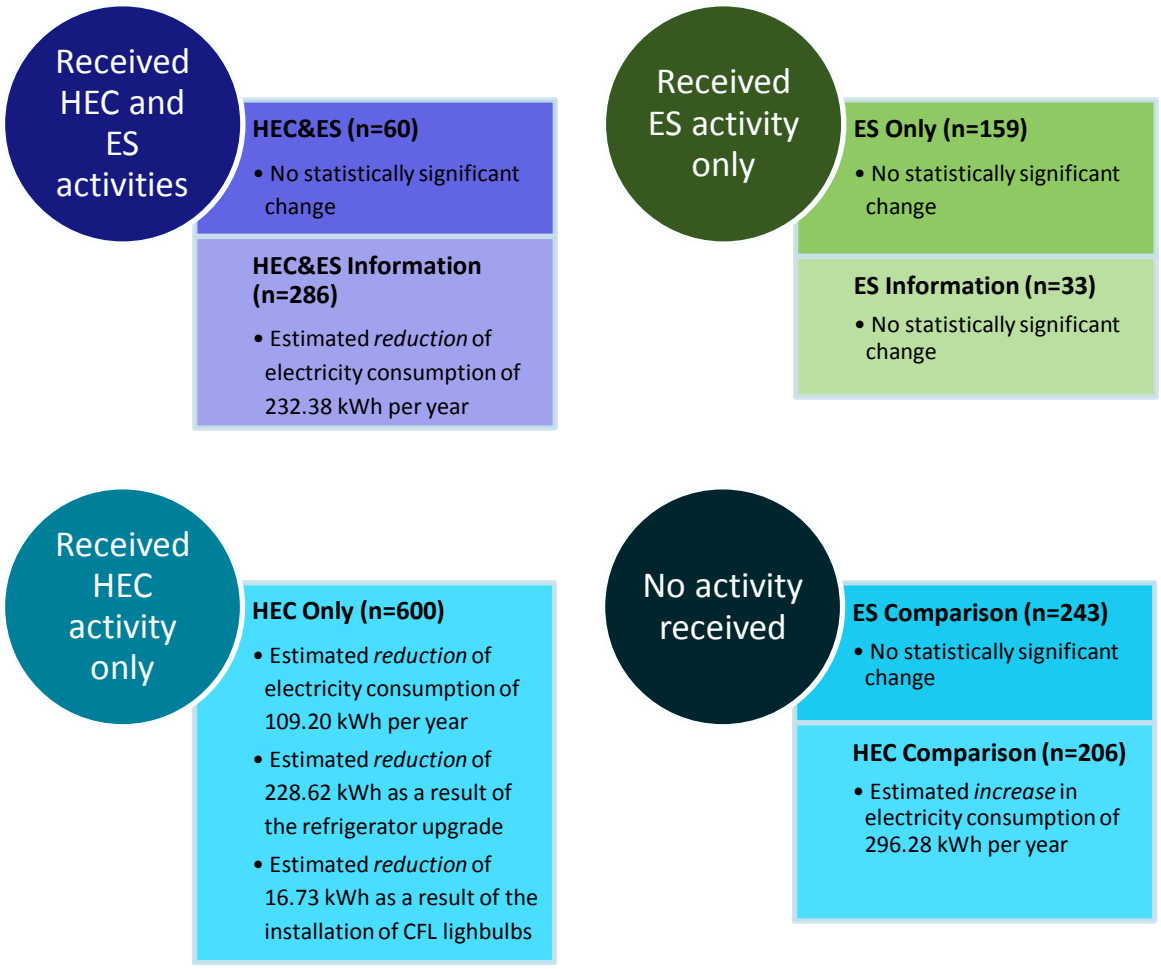


Figure 10 Energy modifications and change in energy consumption (over a 6-month period; pre-program and post-program comparison)[1]

3.2 Objective 2: To improve the energy efficiency of seniors' homes and contribute to their health and wellbeing

This section responds to the GHW Program Objective 2:

- To improve the energy efficiency of low-income seniors' homes and contribute to their health, well-being and ability to remain in their homes.

3.2.1 IMPROVING THE ENERGY EFFICIENCY OF LOW-INCOME SENIORS' HOMES

A range of appliances and/or modifications were installed in 920 participants' homes. Participants in HEC Only, HEC & ES and HEC & ES Information activities (n=1,000) were eligible to receive free modifications and/or a heavily discounted appliance as part of the GHW Program. As shown in Figure 11, most participants (92%) received an appliance upgrade and/or free modification.

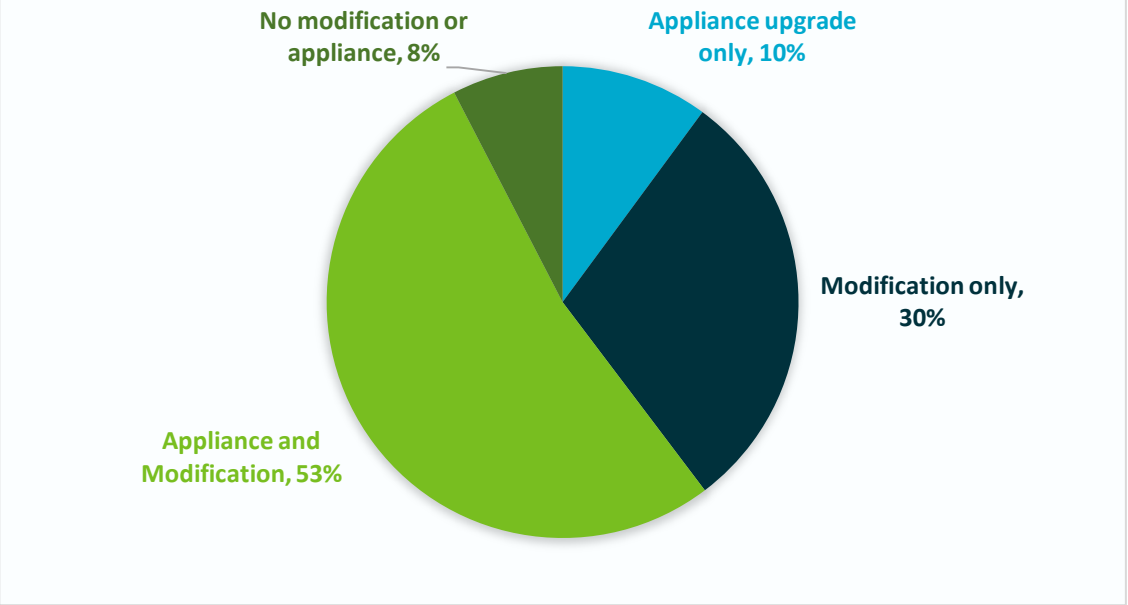


Figure 11 Percentage of participants in HEC Only; HEC & ES and HEC & ES Information who received program incentive

Figure 12 shows that the appliance[14] mostly commonly installed as a result of the HEC was the refrigerator (n=360; 36%), followed by a washing-machine (n=266; 27%). In regard to the modifications, the most installed modifications were power controllers (n=483; 48%), CFL lightbulbs (n=412; 41%) and ceiling fans (n=333; 33%).

[14] It is important to note that the air-conditioner upgrade was limited to participants with specific health conditions. Overall, only two participants were eligible for the air-conditioner upgrade. Both participants proceeded with the upgrade.

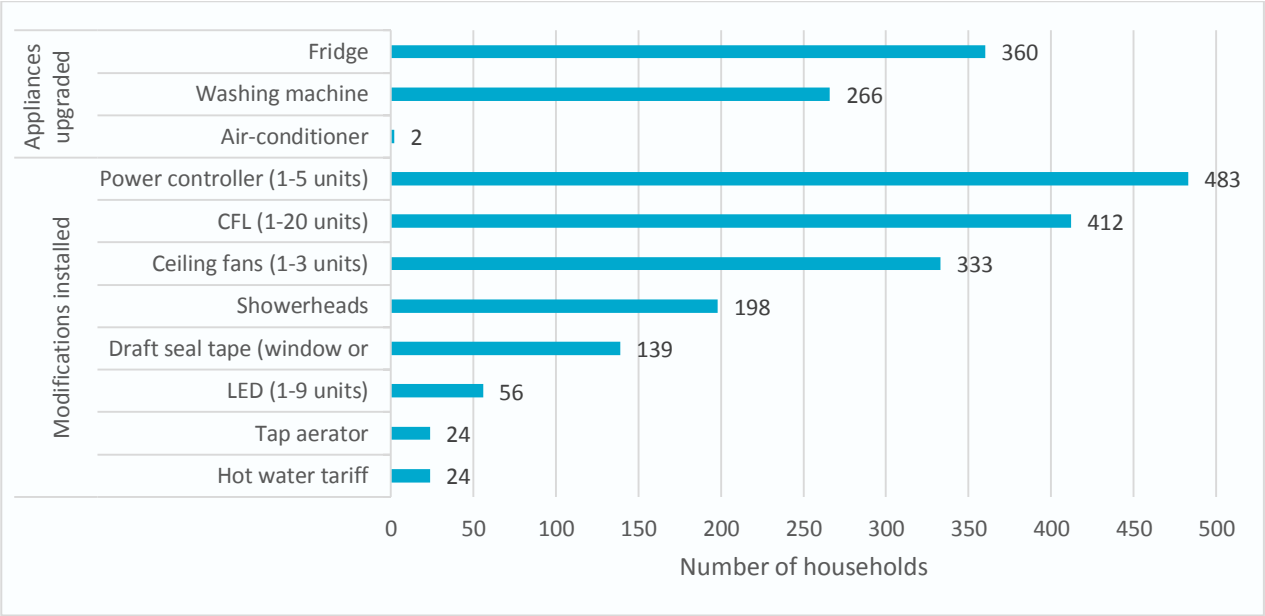


Figure 12 Number of households that upgraded appliance and/or installed modification

As discussed in Section 3.1.3, both the refrigerator upgrade and the installation of CFL lighting were associated with a significant reduction in household energy consumption. Participants who received a HEC were indeed very appreciative, with 58% of those participants surveyed stating that the appliance and/or modifications installed were the most significant outcome from participation in the program (further feedback from participants is discussed in Section 3.5). Table 6 shows illustrative quotes about the appliances and/or modifications received and their perceived impact on their home's energy efficiency.

Table 6 Participants' feedback about home modifications received

APPLIANCE AND/OR MODIFICATION RECEIVED	ILLUSTRATIVE QUOTE
Refrigerator upgrade	*Has helped to be more energy efficient and receiving new fridge at reasonable cost. Power bill has reduced a large amount with the help of program* (HEC Only participant)
Ceiling fans	*The installation of the 2 fans. I don't have much ventilation in the kitchen and they're great* (HEC & ES Information participant)
Ceiling fans and draft proofing	*A ceiling fan was installed which made it more convenient in a small bedroom than a pedestal fan. Draft proofing, I was not aware of the significance of this action* (HEC Only participant)
Ceiling fans and powerboards	*Ceiling fans and foot powerboard. Fans will cut down air-con use in summer. Footboard makes turning off TV much easier* (HEC Only participant)
Washing machine	*Being able to do bigger loads of washing more efficiently* (HEC Only participant)
CFL lighting	*Receiving low energy lighting in living area to enjoy better lighting when having friends and family visiting. Lighting is so much better and I don't have the worry of excess power* (HEC Only participant)

3.2.2 CONTRIBUTING TO PARTICIPANTS' WELL-BEING

Perceptions prior to activity (pre-program):

Data collected at the start of the GHW program provides an important baseline measure of how senior Brisbane residents believe energy usage influences their wellbeing. Understanding residents' perceptions of how energy efficiency is associated with their level of comfort and quality of life before any program activity takes place is essential to evaluate the effectiveness of the GHW program in this regard.

At the start of the program, participants already held positive attitudes towards energy efficiency, with the majority of participants disagreeing that energy efficiency reduces their level of comfort and/or quality of life. In general, pre-program survey responses indicated that participants did not think that they had to compromise on comfort or quality of life to be energy efficient. For example, the majority of participants disagreed with the following statements[15]:

- 'Energy efficiency will restrict my freedom' (81% disagreed)
- 'Energy efficiency is too much of a hassle' (76% disagreed)
- 'Energy efficiency means I have to live less comfortably' (69% disagreed)
- 'My quality of life will decrease when I reduce my energy use' (56% disagreed)
- 'Energy efficiency is not very enjoyable' (56% disagreed).

Data collected in the pre-program surveys shows that heating and cooling systems play an important role in providing participants with thermal comfort at home. Home thermal comfort is especially important for seniors' wellbeing, as the literature suggests that senior householders are more likely to spend time at home, with a study in the United Kingdom estimating that this target audience might spend 85% of their time in the home (House of Lords, 2005). This finding is supported by other research which suggests that retirees who re-orient themselves from work to more passive activities, such as watching TV and reading books, are less likely to socialise outside the home (Patulny, 2009).

Data collected at the start of the program indicates that the majority of participants rely on air-conditioning and/or fans for home thermal comfort. For example:

- Over two-thirds of participants (70%) indicated that they used air-conditioning for cooling. As shown in Figure 13, participants with air-conditioning at home were less likely to feel comfortable at home without air-conditioning and/or heating appliances. For example, 69% of participants who did not have an air-conditioner at home reported a higher degree of comfort (i.e. levels 4 and 5 on the scale) without air-conditioning and/or heating appliances, compared with those who did have an air-conditioner at home, with only 38%, in this case, reporting the same degree of comfort.
- Participants who lived in older homes (aged 50 years and above) were less likely to have air-conditioning at home.
- The vast majority of participants (89%) reported the use of fans for thermal comfort at the start of the program. When completing the pre-program surveys, participants reported the use of:
    - Both ceiling and portable fans (38%)
    - Ceiling fans only (30%)
    - Portable fans only (21%)
    - No fans used for cooling (11%).

[15] Further statistics regarding these measures are presented in Table 50 in Appendix A.4.

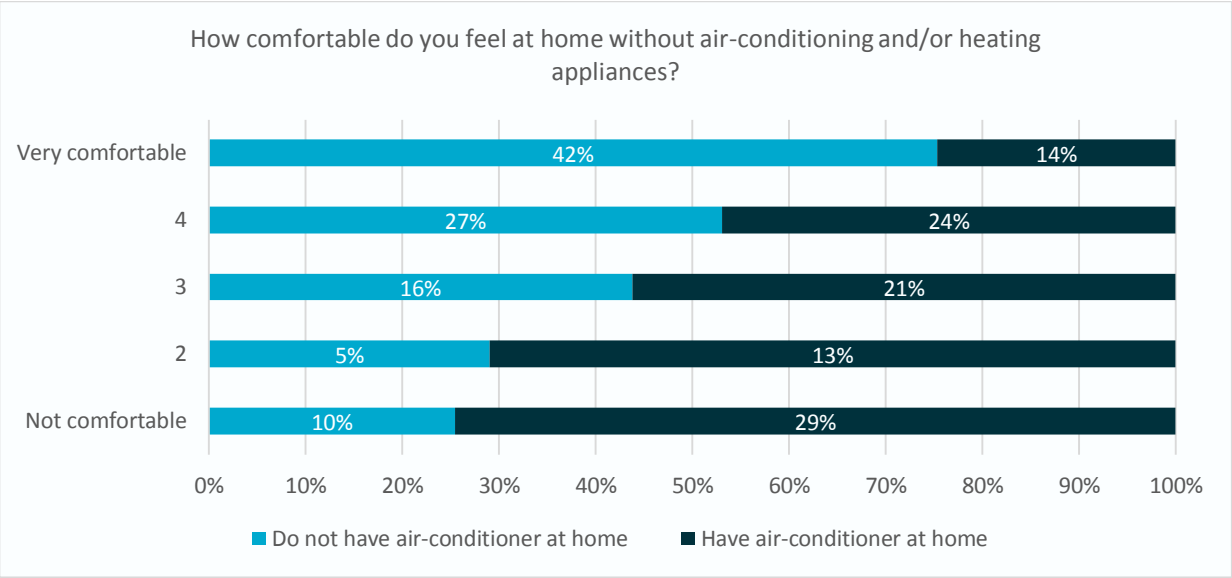


Figure 13 Percentage of participants that feel comfortable at home without cooling/heating systems (Pearson chi-square (4) = 183.3; p< 0.001)

Most participants (80%) reported being able to afford to heat and/or cool their homes appropriately in the pre-program survey. However, as shown in Figure 14, 9.4% of participants who did not have air-conditioning at home reported having difficulty or severe difficulty (i.e., often or always) when it came to being able to afford adequate levels of thermal comfort, as opposed to 5.5% of participants who had air-conditioning at home. This finding further emphasises that air-conditioning plays an important role in providing Brisbane seniors with thermal comfort at home.

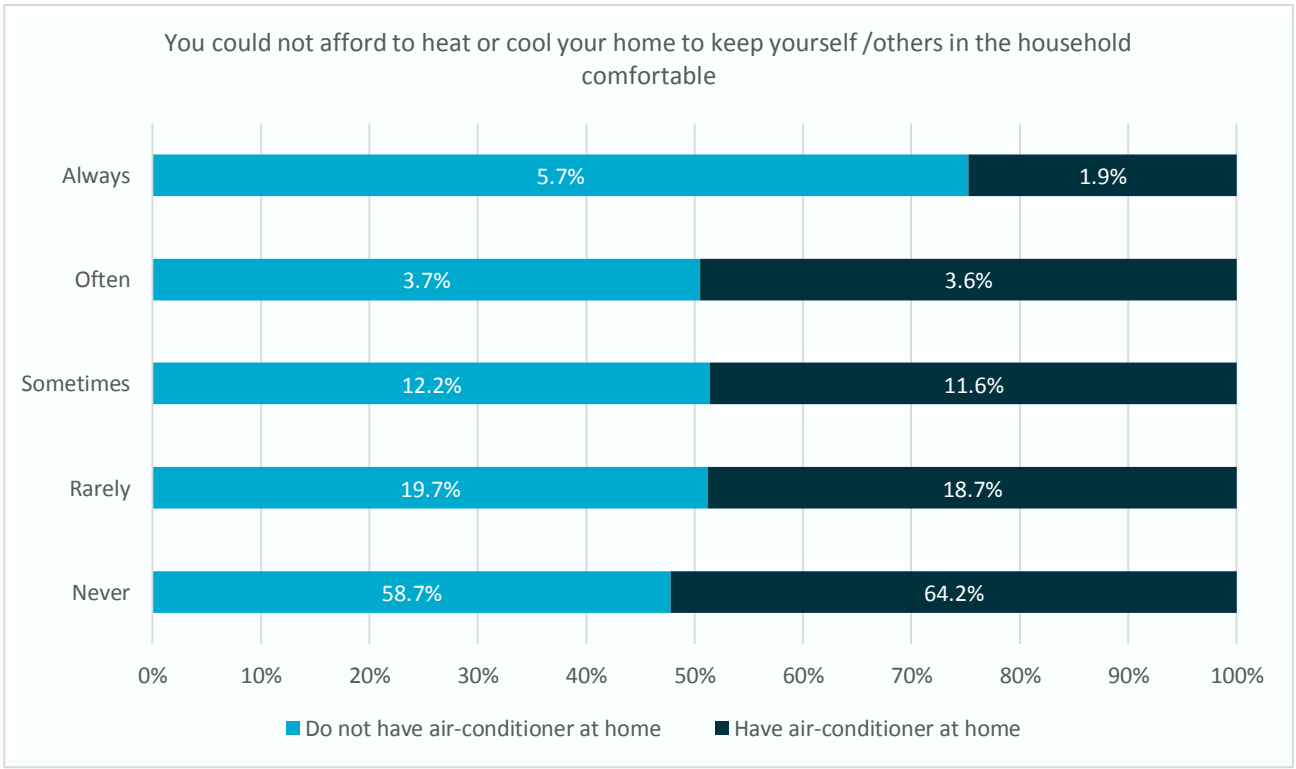


Figure 14 Percentage of participants that could not afford appropriate heating or cooling (Pearson chi-square (4) = 17.3; p< 0.01)

Change in perceptions (pre-program and post-program comparison)

Despite the fact that the majority of participants disagreed that energy efficiency would compromise their level of comfort and/or quality of life (i.e. wellbeing) at the start of the program, participants' responses to these measures at the end of the program show significant improvement. This means that, overall, participants were even less likely to feel that energy efficiency would compromise their wellbeing in these areas.

Overall, there was a positive change of participants' perceptions of the impact of energy efficiency on their level of comfort and quality of life. As shown in Figure 15, this improvement was most evident in the ES Only group. However, the HEC & ES Information group was more likely to agree with the statement 'My quality of life will decrease when I reduce my energy consumption' at the end of the program. This might be due to the fact this group participated in the program during summer, when there is a greater need for the use of air-conditioning for thermal comfort[16]. Participants' reliance on heating and cooling systems for thermal comfort is further discussed below.

When comparing post-program responses with those collected prior to the program, over one-third of individuals in the HEC Only and ES Only treatments reported greater levels of comfort at home without heating and cooling appliances. While participants' self-reported levels of comfort at home without air-conditioning and/or heating appliances reduced within ES Comparison and HEC & ES Information groups, post-program survey data collected within those groups was mostly collected during summer when households were more likely to need air-conditioning for thermal comfort. On the other hand, post-program survey data for HEC Only and ES Only were mostly collected in Spring when temperatures were milder[17].

While data analysis did not identify any association between self-reported behaviour and actual energy consumption, participants' self-reports of their own energy behaviour indicate that there was an increase in energy efficient use of heating and cooling appliances for participants in the HEC Only, ES Only and ES Comparison groups (see Figure 16). This increase did not apply, however, to the ES Information and HEC & ES Information groups. The improvement within ES Comparison group might reflect the fact that the survey itself provided examples of energy saving behaviour actions, which may have been absorbed and subsequently adopted by participants.

Post-program data also shows that participants greatly improved their energy efficient use of heating and cooling systems in the HEC Only, ES Only and ES Comparison groups. Such behaviour was also emphasised in the feedback received by participants, as shown in the quote below:

> *'[The field officer] visited and checked everything. We were told to run our aircon on a higher temperature, and run heater on lower temperature … and [we now] do not use anywhere near as much power from just changing the temperature settings'* (HEC Only participant).

However, a comparison of pre-program and post-program survey data shows that this behaviour could still be further improved (see Table 48). Although the program provided information about how to use heating and cooling systems efficiently, participants' feedback suggests that the program-recommended temperatures for energy efficient use of heating and cooling systems do not provide thermal comfort for them. This might be because seniors are more sensitive to ambient temperatures due to more sedentary lives (Hamza and Gilroy, 2011).

[16] Further details of the timing of survey completion and seasonal weather are provided in Figure 23 and Figure 24 in Appendix A.1.
[17] Further details of timing of survey completion and seasonal weather are provided in Figure 23 and Figure 24 in Appendix A.1.

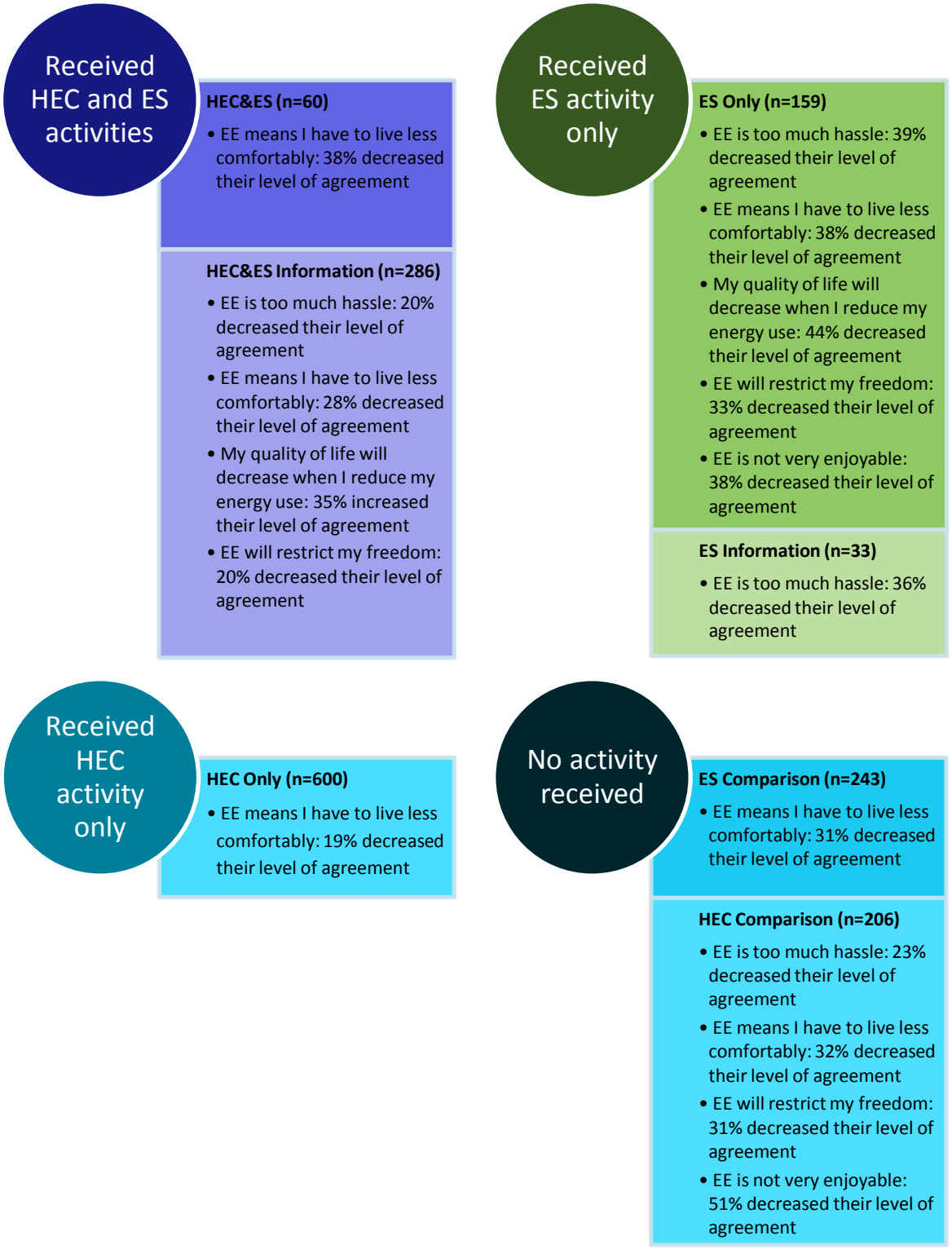


Figure 15 Change in participants' perceptions of the impact of energy efficiency (EE) on their comfort and/or quality of life[18] (pre-program and post-program comparison)

[18] Improvement in attitudes means that participant rated higher disagreement with statement in post-program survey when compared to pre-program survey. Reduction in attitudes means that participant rated higher agreement with statement in post-program survey when compared to pre-program survey.

For example, feedback from a convenor delivering an ES session suggests that this target population would prefer to set their heating with warmer temperatures in winter (above 18°C), as stated in the quote below:

> *'Some members thought from experience that the winter air conditioner's temperature is too cold at 18°C. They prefer 23°C and [Energy Retailer] has told one member that they recommend 26°C. So, they are saying that the recommended level by CSIRO is too cold for their comfort'* (Energysavers' convenor, Session 2).

These findings indicate that there may be some discrepancy between ideal energy efficiency behaviour promoted by experts, and expectations regarding thermal comfort in senior households.

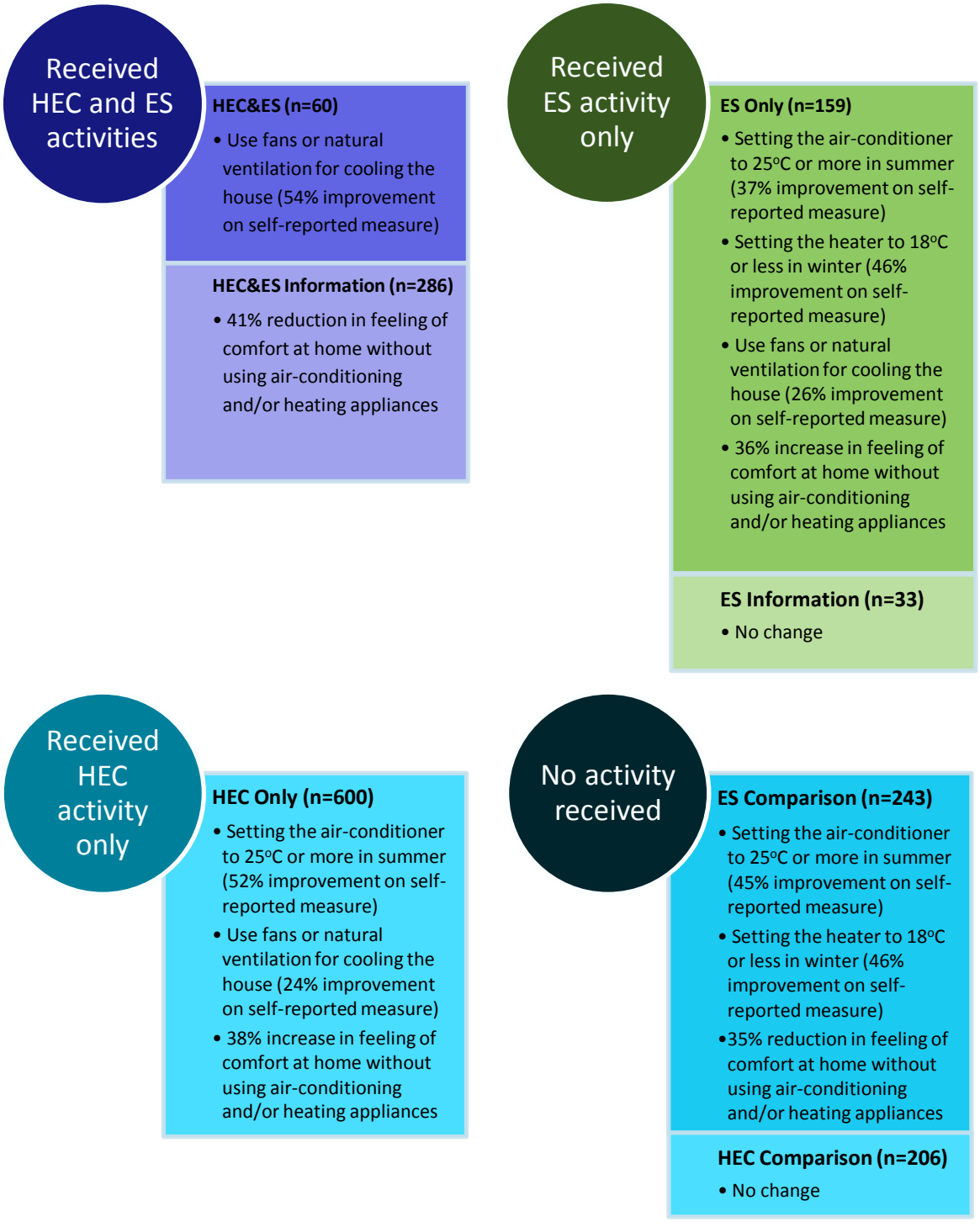


Figure 16 Impact of GHW Program on participants self-reported behaviour

Increase in the number of homes with ceiling fans (pre-program and post-program comparison)

Data collected show that 325 participants (32.5%) that received a HEC did not have ceiling fans. Of those, 153 (47%) received one or more ceiling fans as part of the GHW program. This means that at the end of the program, 82.8% of participants had a ceiling fan compared to 67.5% of participants at the start of the program. Qualitative data received in the post-program survey also suggests that many participants associated the home energy modifications they received with an increase in their well-being. This was particularly evident on the question where participants were asked to outline the most significant outcome they experienced from the project. Table 7 shows illustrative quotes from participants about the appliances and/or modifications installed and their feelings of comfort and well-being.

Table 7 Participants' feedback about home modifications received and their level of comfort and well-being

APPLIANCE AND/OR MODIFICATION RECEIVED	ILLUSTRATIVE QUOTE
Refrigerator upgrade	*The new fridge is making me more practical with my shopping, because it is smaller and therefore I am not buying too much which may go to waste* (HEC Only participant)
Ceiling fans	*I received a fan for my bedroom and it has made my sleeping more comfortable* (HEC Only participant) *Getting the fan extra I'd say because it gave us an alternative to the air con* (HEC & ES Information participant) *The ceiling fan - it was for my husband's bedroom and he is unwell* (HEC & ES Information participant)
Ceiling fans and power boards	*The ceiling fan as it helps keep us cool and the power controller. We can turn off the TV now when before we couldn't reach* (HEC & ES Information participant)
Showerheads and power boards	*Receiving power boards and hand held showerhead makes it easy for my body and shower has saved water plus makes it easy to clean shower recess* (HEC Only participant) *It was the fan in the bedroom and the hand held shower which (were) absolutely fantastic. It's really helping to keep me cool rather than using the air con* (HEC & ES Information participant)
Power board	*Power Board - don't have to bend down to turn off power and I like the look of it* (HEC & ES Information participant)
OVERALL COMMENTS	
Contribute to ability to remain in their own homes	*Made me feel more secure in staying in my own home by way of having more control over my energy bills* (HEC Only participant)

3.3 Objective 3: To help seniors manage energy costs

This section responds to the GHW Program Objective 3:

- To help low-income seniors manage energy costs by better managing energy consumption

As discussed in the Section 3.1, data collected through the GHW program shows that, in general, participants were already very careful about their spending and already performing many energy saving actions[19] at the start of the program. In addition, electricity consumption data shows that consumption among program participants was below the Brisbane average for both one person and two person households across all four seasons[20].

Change in energy costs (pre-program and post-program comparison)

In line with the results presented in Section 3.1.3, electricity consumption reductions (kWh) were used to estimate the changes in electricity costs and related carbon emissions that resulted from the program (please refer to Appendix A.7 for further details of how electricity costs and related carbon emissions were estimated). Households' electricity bills and related carbon emissions reduced within HEC Only and HEC & ES Information participants, with costs and carbon emission savings being highest amongst households who received a refrigerator upgrade. For detailed results, please refer to Table 66 (Appendix A.6).

Table 8 Summary of estimated changes in electricity costs and emissions over the program

ACTIVITY	SAMPLE SIZE	STATISTICAL CHANGE	PER PERSON CHANGE IN ELECTRICITY COSTS ($/YEAR)	TOTAL CHANGE IN ELECTRICITY COSTS ($/YEAR)	PER PERSON CHANGE IN EMISSIONS (KG CO_2-E/YEAR)	TOTAL CHANGE IN EMISSIONS (TONNES CO_2-E/YEAR)
HEC Only	*654*	*Reduction*	-$32.11	-$20,998.68	-88.45	-57.85
ES Only	*165*	*No change*	$23.89	$3,941.35	65.80	10.86
HEC & ES	*60*	*No change*	$6.29	$377.18	17.32	1.04
ES Information	*33*	*No change*	$31.43	$1,037.06	86.57	2.86
HEC & ES Information	*286*	*Reduction*	-$68.33	-$19,541.43	-188.23	-53.83
All Activities Combined	*1198*	*Reduction*	-$29.37	-$35,184.52	-80.91	-96.93
HEC Comparison	*206*	*Increase*	$87.12	$17,945.73	239.99	49.44
ES Comparison	*243*	*No change*	$1.28	$310.09	3.52	0.85

Different numbers of program participants were involved in the different activities, and these activities had different impacts on their electricity costs and associated emissions. To gain a sense of the program's aggregated impact, the comparison groups were excluded (because they received no intervention activity), and the total impact on electricity costs and emissions of all activities was calculated. Across all activities, the program yielded a per person decrease in electricity costs of $29.37 per year, and a per person reduction in carbon-equivalent emissions of 80.91 kg per year. Aggregated across the 1198 participants in

[19] Pre-program and post program survey data collected about participants' energy saving behaviour and attitudes towards wastage are presented in Table 48 and Table 54, respectively (Appendix A.4).1

[20] Further details provided in Figure 9 in Section 3.1.3.

these groups, this equates to an estimated total saving of $35,184.52 per year in electricity costs, and a total reduction of 96.93 tonnes per year in carbon-equivalent emissions.

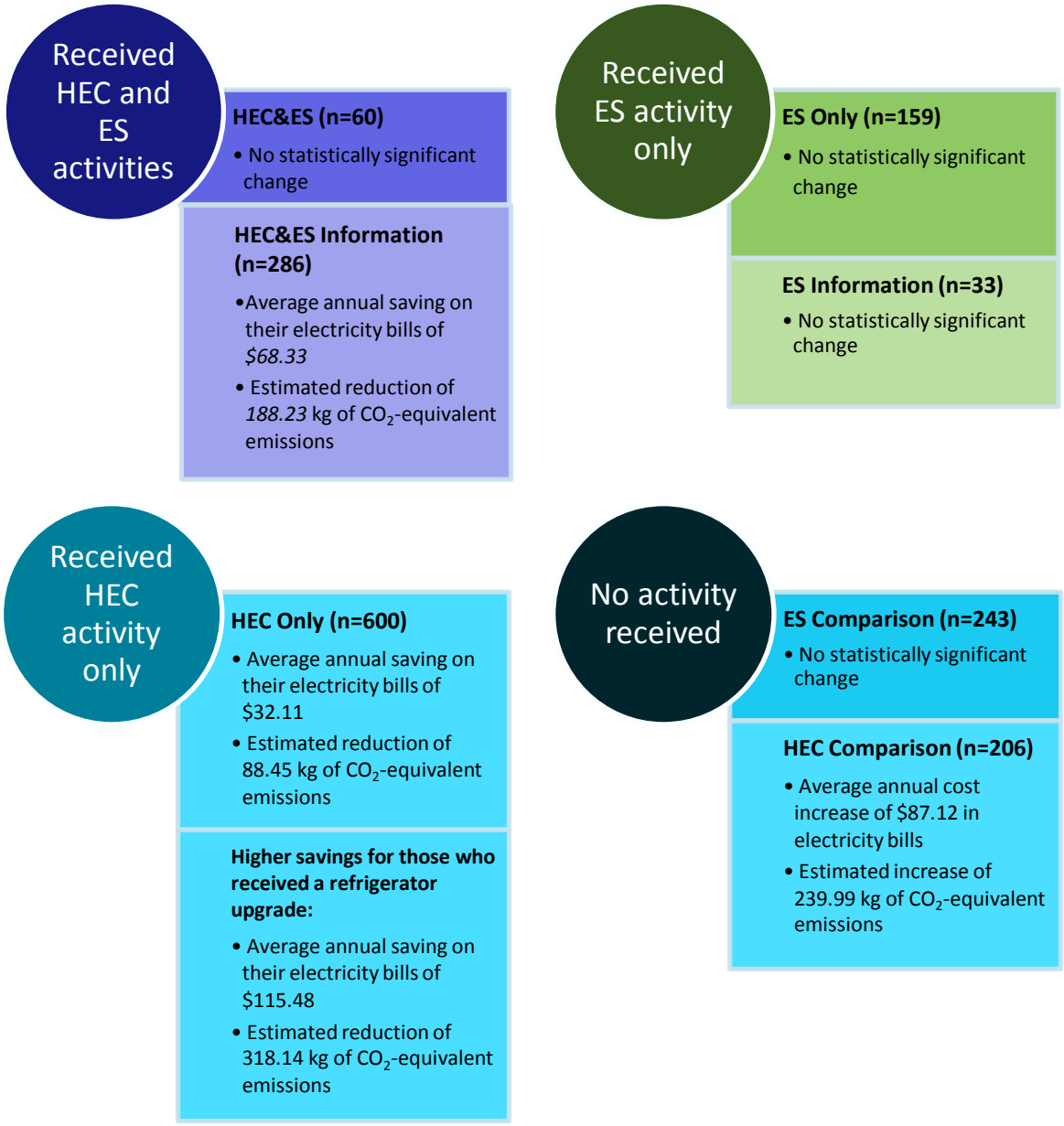


Figure 17 Change in energy costs (pre-program and post-program comparison)

Households' electricity bills and related carbon emissions increased within HEC Comparison participants

As discussed in Section 3.1.3, HEC Comparison participants showed an increase in energy consumption over the same period, resulting in an increase in energy cost and related carbon emissions (for details, refer to Table 56, Appendix A.6). Climate data from the Bureau of Meteorology (further details provided in Figure 25 in Appendix A.6) shows that monthly mean maximum temperatures as well as monthly highest temperatures were higher in the post-program period analysed (October 2014 to March 2015) when compared to the pre-program period analysed (October 2013 to March 2014). The higher temperatures

faced by participants post-program suggest that participants might have had a greater need for air-conditioning use for thermal comfort post-program.

3.4 Objective 4: To inform future program initiatives

This section responds to the GHW Program Objective 4:

- To inform future local, State or Federal government energy efficiency policy and program initiatives amongst this target population.

The GHW program collected extensive empirical data on seniors' patterns of energy usage, which provides valuable information for all subsequent energy efficiency programs and policy considerations in this area. Some key findings are discussed in this section.

Participants' electricity consumption prior to activity (pre-program):

A regression analysis, including a range of demographic and self-reported measures, was conducted to identify the main factors associated with household energy consumption amongst the program participants. As shown in Figure 18, participants' energy consumption at the start of the program was associated with a range of factors outlined below. For regression analysis results, please refer to Table 62 (Appendix A.6).

Participants tended to have higher levels of electricity consumption if:

- Their home relied solely on electricity sources (as opposed to use of other sources such as gas)
- Their home was larger (i.e. homes with higher number of bedrooms)
- Their household size was larger (i.e. larger number of people living in the household)
- Their household had a higher income
- Participants were younger (note: the minimum age requirement for participation in the program was 60 years)
- They had air-conditioning for cooling and/or heating the home
- Participants self-reported lower levels of:
    - Control over energy bills at the start of the program
    - Comfort without use of air-conditioners and/or heaters
    - Their own home energy efficiency.

Other factors such as age of home and attitudes towards energy efficiency did not contribute to explaining household electricity consumption within our study sample. While the literature suggests that older homes are more likely to be energy inefficient, an analysis of electricity meter data collected during the program does not suggest that participants in this sample who lived in older homes consumed more energy than those who lived in newer homes.

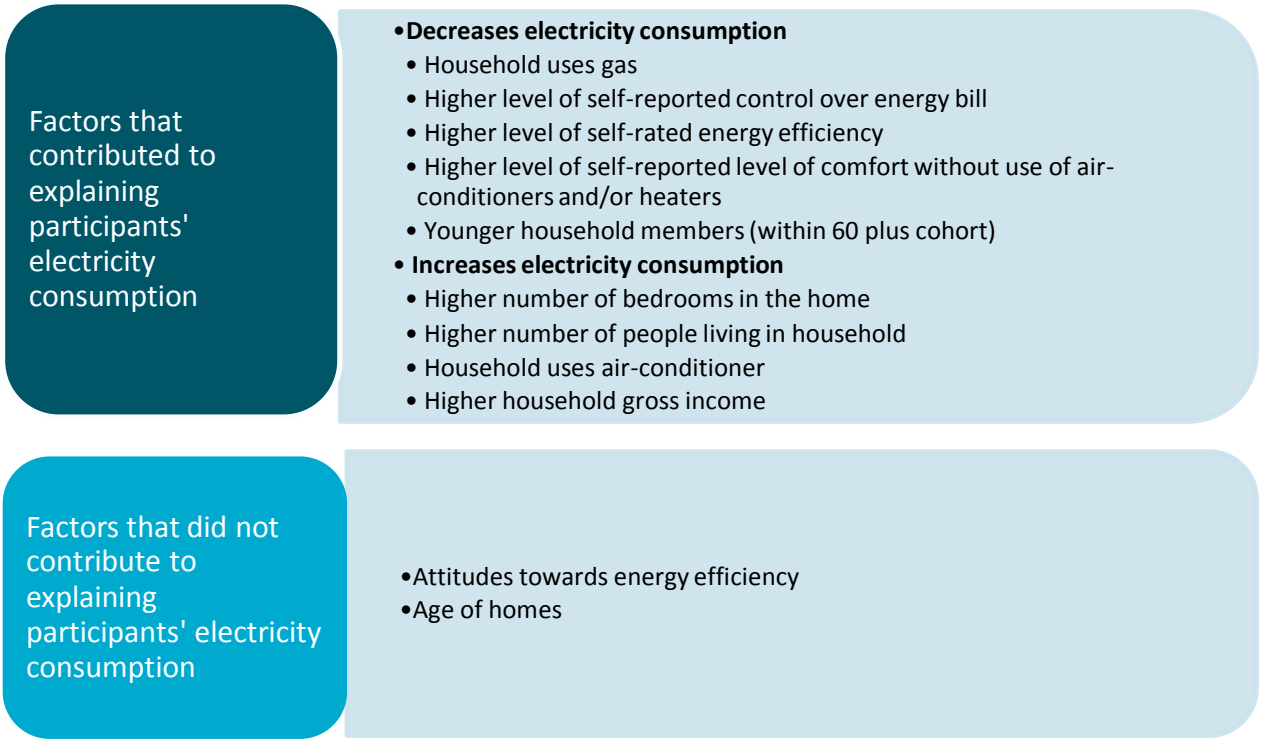


Figure 18 Indicators of participants' energy consumption prior to activity (pre-program)

Change in energy consumption (pre-program and post-program comparison)

A regression analysis including a range of factors was conducted to investigate if they contributed to changes in participants' energy consumption. In line with findings discussed in Section 3.1.3, the regression showed that, in general, participants who received a HEC activity showed a significant reduction in energy consumption if they received a refrigerator upgrade and/or installed CFL lighting[21].

Findings show that other factors were also associated with changes in electricity consumption during the program. Most specifically, participants who self-reported higher levels of comfort without cooling or heating appliances at the start of program were also more likely to have a reduction in their household energy consumption by the end of the program. However, participants living in households with a larger number of residents, as well as those living in households using air-conditioning for cooling and/or heating, were less likely to reduce their household energy consumption. For regression analysis results see Figure 19 and Table 65 (Appendix A.6).

Regression results suggest that the greater the reliance on heating and cooling systems for thermal comfort, the less likely households were to reduce their energy consumption. This is an important finding as heating and cooling accounts for around 40% of household energy use[22], representing a large share of households' energy consumption.

[21] This means that changes in energy consumption are associated with the refrigerator upgrade and CFL lighting and not the HEC activity in itself.
[22] For further information about the impact of heating and cooling on energy usage please refer to http://www.yourhome.gov.au/energy/heating-and-cooling

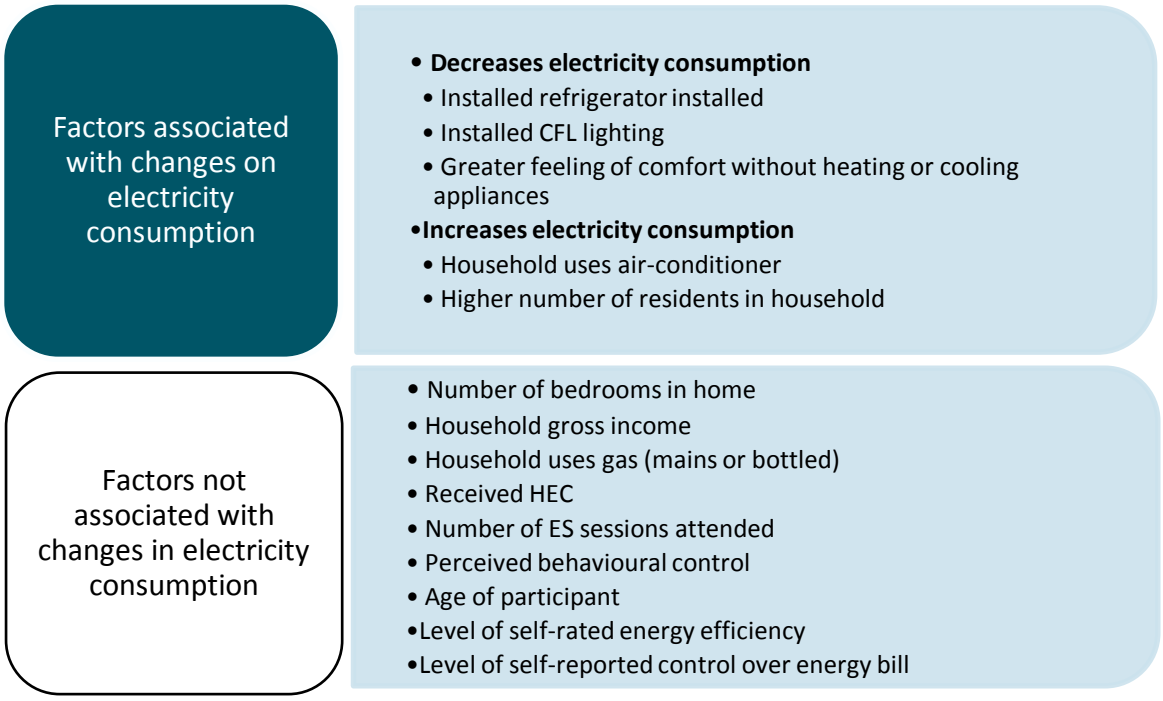


Figure 19 Indicators of change in energy consumption

Reported barriers for improving energy efficiency

The post-program survey also asked participants whether they encountered any barriers to improving their energy efficiency. While most participants agreed that there were barriers (57%), only 6% of participants specified what these barriers were. As shown in Figure 20, participants who responded to the post-program survey with CSP assistance (HEC Only; HEC & ES or HEC & ES Information) were more likely to agree that there were barriers to changing energy use in their home. This result raises the question of whether the survey mode influenced participants' responses to this question.

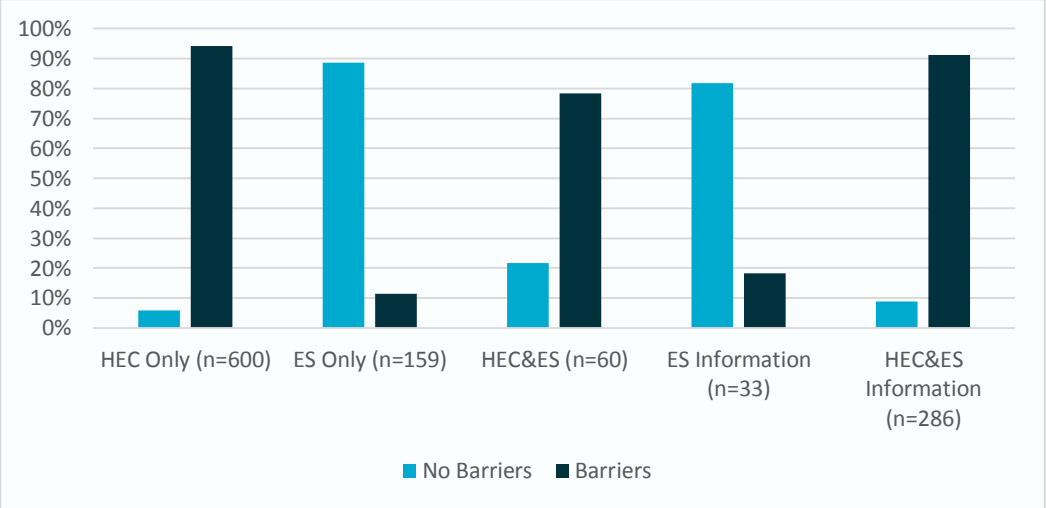


Figure 20 Perceived barriers to changing energy use in the home

Overall, 94 respondents specified the barriers they faced to improve their energy efficiency. These were analysed thematically into 14 barriers, which are presented in Figure 21. The leading barrier to change was resistance by other householders (n=20; 21%), with 'husband' and 'adult children' often listed as such barriers. Other barriers identified were medical issues that required specific heating and cooling levels (n =11; 12%), and affordability (n=11; 12%), followed by the need for air-conditioning in extreme weather such as during hot summer days (n=7; 7%).

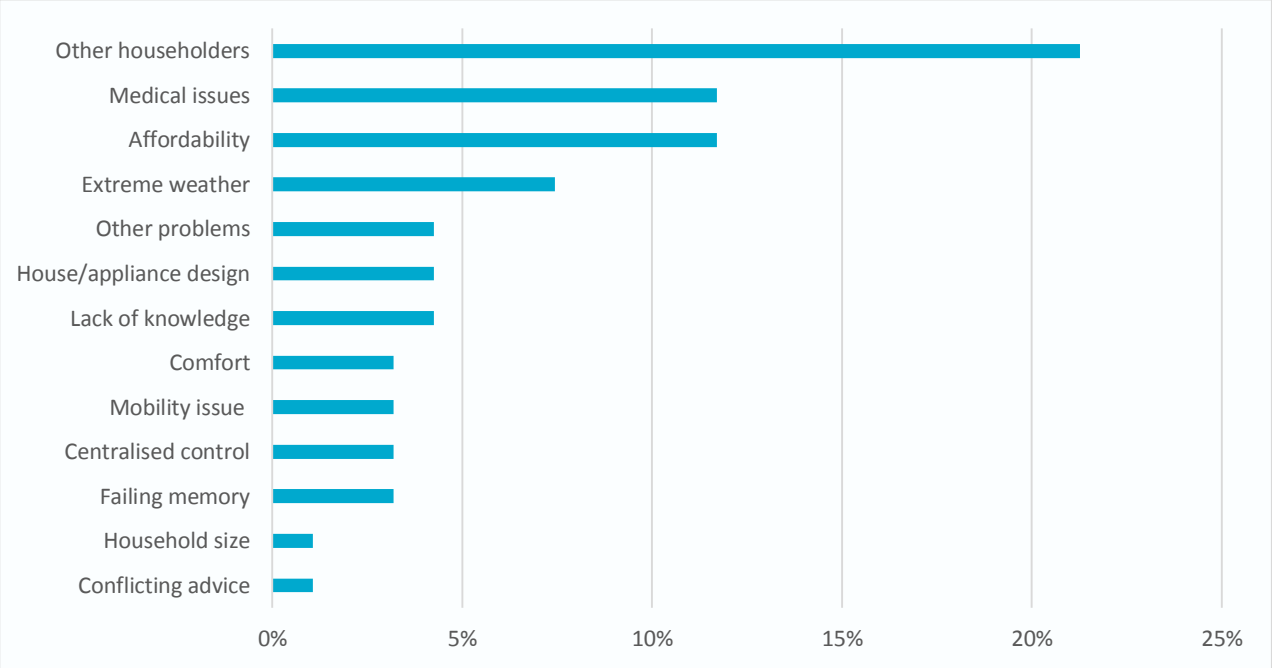


Figure 21 Perceived barriers to energy reduction

Program cost-benefit analysis

A cost benefit analysis[23] was conducted using program cost data provided by the Council, and treated reductions in electricity costs as the annual benefit of the interventions. This analysis excluded participants in the Comparison groups, who did not participate in any activity. Results are shown in Table 9.

Assessed as a single program over a 12-month period, the five activities in combination yielded a small positive benefit-cost ratio. Of the five intervention groups, the HEC only and HEC & ES Information activities showed a small positive benefit-cost ratio. These activities yielded benefits, but the costs of delivering these interventions (reflecting the cost of replacement appliances as well as in-home assessments) is high compared to the annual estimated benefit gained in reduced electricity bills.

The HEC and ES Information activity provided the strongest benefit-cost ratio (0.033) and the best cost-effectiveness ratio ($8.94 per kWh of abated electricity consumption, or about $11,000 per tonne of abated carbon emissions). This activity, in combining both appliance replacement and the information from the EnergySavers program, appears to yield more impact than either of these activities conducted alone.

The other specific activities did not yield positive benefits (as participants in these activities did not, on average, decrease their consumption of electricity over the trial). Even though these activities were

[23] Conducted with reference to guidance provided by the Australian Government Office of Best Practice and Regulation, via: http://ris.dpmc.gov.au/2013/07/29/obpr-guidance-note-cost-benefit-analysis/

cheaper to deliver, with no detectable decrease in energy consumption over the trial period, these activities cannot yield a positive benefit-cost ratio, nor a positive cost-effectiveness ratio.

Table 9 Cost-Benefit and Cost-Effectiveness Analysis

ACTIVITY	SAMPLE SIZE	TOTAL TRIAL COST ($000) [A]	TOTAL BUSINESS COST ($000) [B]	AVERAGE PER PERSON BENEFIT ($/YEAR) [C]	TOTAL BENEFIT ($000/YEAR) [C]	BENEFIT COST RATIO [D]	COST EFFECTIVENESS RATIO ($000/ABATED TONNES CO_2-E) [D]	COST EFFECTIVENESS RATIO ($/ABATED KWH ELECTRICITY) [D]
HEC Only	654	$1,264	$1,137	$32.11	$21.00	0.018	19.66	15.92
ES Only	165	$299	$264	-$23.89	-$3.94	-0.015	-24.29	-19.67
HEC & ES	60	$174	$161	-$6.29	-$0.38	-0.002	-155.37	-125.85
ES Information	33	$39	$31	-$31.43	-$1.04	-0.033	-11.02	-8.93
HEC & ES Information	286	$656	$594	$68.33	$19.54	0.033	11.04	8.94
All Activities Combined	1198	$2,433	$2,188	$29.37	$35.18	0.016	22.57	18.28

[A.] Total trial cost (Level 4 in the department's guidelines) refers to the summed costs of delivering the trial to participants, recruitment and maintenance of participants, running an organisation to deliver the trial, and participating in a government-funded trial including research and in-kind costs. Figures provided by BCC.

[B.] Total business cost (level 3 in the department's guidelines) refers to the costs above but excludes participating in a government-funded program, and thus reflects the cost of conducting the trial as though it were a business. Figures provided by BCC.

[C] Expressed as a reduction in annual electricity costs, estimated earlier in this report.

[D.] These ratios are calculated using the total business cost in each case.

Table 10a Net Present Value Calculations

ACTIVITY	DISCOUNT RATE APPLIED	10-YEAR NET PRESENT VALUE ($000)	10-YEAR TOTAL BENEFIT ($000)	BENEFIT-COST RATIO
HEC Only	3%	-1,080	163	.13
	7%	-1,107	137	.11
	10%	-1,122	121	.10
HEC & ES Information	3%	-484	152	.24
	7%	-509	127	.20
	10%	-524	113	.18

The net present values (NPV) of the two activities that showed benefits (HEC Only, HEC & ES Information) were calculated and are shown in Table 9a. Such calculations assess the long-run benefit over multiple years, relative to the single upfront cost of delivering the activity. The useful life of the new appliances was conservatively estimated to be 10 years, so NPV was calculated over this period. Discount rates of 3%, 7% and 10% were used in the calculations.

The NPV calculations indicate that over ten years, the HEC Only activity could be expected to yield a long-run benefit of between $121,000 and $163,000, with a benefit-cost ratio of .10 to .13. The HEC & ES Information activity could be expected to provide a long-run benefit of between $113,000 and $152,000, with a benefit-cost ratio of .18 to .24.

It is noted that these calculations (benefit-cost ratios, cost effectiveness ratios, net present value) are not able to account for a number of other benefits that are not easily quantified in financial terms, in particular:

- The indirect environmental benefits of reduced emissions via a reduction in electricity consumption.
- The benefits of increased home comfort and wellbeing for participants, increasing seniors' ability to remain out of residential aged care discussed earlier in this report. In 2003 it cost the Commonwealth, on average, approximately $30 000 per annum to fund an average residential aged care bed compared to the average cost of a Community Aged Care Package of approximately $10 000 per annum[24]. Converting to 2015 AUD this benefit would equate to approximately $27,276 per person per year.
- The mitigated impact of likely future price rises in electricity costs: systematically reduced costs now are likely to become increasingly financially valuable over time as electricity prices continue to rise.

24 'Caring for the Elderly' - an Overview of Aged Care Support and Services in Australia, E-Brief: Online Only issued 27 February 2003; updated 30 April 2003, Greg McIntosh, Analysis and Policy &Janet Phillips, Information/E-links Social Policy Group

- The fact that HEC Comparison participants in this program increased their electricity usage over the same period, whilst other activities were yielding either no changes or a decrease in consumption. Although it is not appropriate to formally calculate a difference between the HEC activity and HEC comparison groups, these results do suggest that the interventions that reduced consumption did so in a background environment where consumption amongst other households was increasing.

3.5 Participants' feedback

Qualitative feedback was collected in the post-program surveys and post-program interviews. The post-program interviews were conducted by CSIRO with approximately five percent of participants who participated in a HEC and/or ES activity. The interviews were conducted by telephone during January 2015, and lasted up to 15 minutes. In total, 62 participants were interviewed. A list of questions asked in the post-program surveys and interviews, as well as the total number of interview respondents per treatment, is provided in the Appendix – Tables 74 and 75.

Overall experience

Overall, participants considered their participation in both HEC and ES activities was a positive experience, with the vast majority of all participants expressing satisfaction in the post-program surveys. Results show that:

- Overall, 93% of participants agreed or strongly agreed that the program was a worthwhile experience for them;
    - Agreement was higher within HEC Only (96%) and HEC & ES Information (95%) treatments
    - Agreement was lower on ES Information (77%) and ES Only (87%) treatments.
- Overall, 93% of participants agreed or strongly agreed that they would recommend the program to friends or family;
    - Agreement was higher within HEC Only (96%) and HEC & ES Information (92%) treatments
    - Agreement was lower on ES Information (81%) and ES Only (86%) treatments.

Post-program interview participants also stated their satisfaction with all treatments. Of the 61 people interviewed, 46 reported that the program was either extremely or very worthwhile, and 11 found the program somewhat worthwhile. The main reasons for considering the program worthwhile were new appliance (n=26), new knowledge (n=6), and the provision of tailored information (n=4).

Post-program interviews also show that the majority of participants would recommend the program to friends and family (n=56). Of the reasons given for recommending this program, the main themes were, in order, to receive reduced-price appliances or a grocery voucher (n=11), for increased energy awareness (n=3), to reduce energy consumption (n=3), to gain new energy knowledge (n=2) and to reflect care for seniors in the community (n=1). The two respondents who would not recommend this program had the opinion that the program would been best directed to a younger age group.

Most significant outcome from participation in the program

The most significant outcome from participation in the program outlined in the post-program surveys were: appliance or modification installed (58% of HEC Only participants and 50% of HEC & ES; HEC & ES Information participants) and acquiring new knowledge about energy efficiency (20% of ES Only; ES

Information participants). Table 11 shows the range of response given by participants as well as illustrative quotes.

Table 11 Most significant outcome from participating in HEC and/or ES interventions and illustrative quotes provided in post-program surveys

	HEC ONLY	ES ONLY; ES INFORMATION	HEC & ES: HEC & ES INFORMATION	ILLUSTRATIVE QUOTES
Appliance or modification installed	58%	n/a	50%	*'[I received] a new ceiling fan that I needed but couldn't afford. Thank you'* (HEC Only participant).
Acquiring new knowledge about energy efficiency	7%	20%	3%	*'Knowing how to convert my kWh to know what each of my appliances cost per year'* (ES Only participant).
Increased energy efficiency awareness	15%	14%	3%	'*I have become more aware of energy usage in my home'* (HEC Only participant).
Enjoyed social interaction	0%	6%	1%	*'[A highlight was] meeting like souls and discussing actions without feeling 'too green' and having a laugh about it'* (ES Only participant).
Reinforced that household is energy efficient	1%	5%	2%	*'It was very interesting but I didn't feel like I had to change because I'm already doing what I can'* (HEC & ES Information participant).
Adopted new curtailment behaviour	1%	3%	1%	*'Ideal temperature settings for a/c and heater'* (ES Only participant).
Reinforced existing knowledge	2%	2%	0%	*'Reinstated the importance of conserving energy.'* (HEC Only participant).
Noticed cost savings	2%	1%	1%	*'Electricity bill has gone down'* (HEC Only participant).
Adopted energy efficient behaviour	1%	1%	1%	*'The tariff change from 11 to 33'* (HEC Only participant).
Other	2%	0%	1%	*It made me feel more secure in staying in my own home by way of having more control over my energy bills'* (HEC Only participant).

This finding is similar to the feedback received in the post-program interviews conducted with five percent of participants as shown in Table 12 .

Table 12 Green Heart Wisdom highlights during post-program participants' interviews

HIGHLIGHT	ILLUSTRATIVE QUOTES
Appliance or modification installed	*'Having the two fans. These ones can be switched off using a remote which is much easier at night time'(HEC Only participant)* *'I received a power board. I think it's great. Really useful not to have to bend over to turn things off. Can just switch everything off in one go' (HEC Only participant).* *'…people can't afford to replace their old appliances sometimes. We found it very helpful'* (HEC Only participant)
Acquiring new knowledge about energy efficiency	'[*The program] triggered off things that you probably knew but weren't activating'*(ES participant) *'Learning about the low cost of fans so we could be more comfortable' (HEC Only participant)*
Increased energy efficiency awareness	*'[I learned] small things around the home to be aware of like seal on fridges' (ES participant)* *'It's very helpful to people like myself that weren't aware of energy as much as I could have been. These meetings let you talk to other people and pick up tips that you might not know otherwise'* (HEC & ES participant) *'Very generous, also it brings an awareness to people to save electricity. I'm very grateful for what I received in the program and would like others to have the chance to do the same.'* (HEC Only participant)
Social interaction	*'[A highlight was] talking with the other people at the table' (ES participant)* *'I went to the discussions too, really enjoyed them and learnt a lot' (HEC & ES Information participant)* *'You can feel isolated at times so it's great that people came into the home and chatted about electricity and involved me'* (HEC Only participant) *'I can't fault the program. I think it was spot on. 10 out of 10. I met some nice people too. I learnt a lot from other people'* (HEC & ES participant) *Great help, gives people an emotional boost. Made her feel less lonely and that people care about older people. It wasn't just the fridge but the communication with more people (…), having different people visit the home.'* (HEC Only participant)
Cost savings	'*As a result of the group discussions I made sure I asked for the best discounts from my energy provider'* (ES participant) *'It gives older people the confidence to ask for discounts because they can be very hesitant'* (ES Only participant)

Main changes regarding household energy usage

The post-program survey asked participants who received a HEC and/or ES activity (n=1198) to state, unprompted, up to three main changes in their household's energy use as a result of their participation. Overall, 760 participants stated at least one change. Changes were combined into 25 themes.

The main themes are displayed in Table 13. The findings are divided into three groups: those who participated only in the HEC activity (HEC Only - main stage and pilot; n=654), those who participated only in the ES activity (ES Only - main stage and pilot; ES Information; n=198), and those who participated both in the HEC and ES activities (HEC & ES; HEC & ES Information; n=346).

Table 13 Main changes in energy use stated by participants in post-program survey (open question)

THEME	DETAILS	HEC ONLY	ES ONLY; ES INFORMATION	HEC & ES; HEC & ES INFORMATION
Energy efficient behaviour	Modifications and/or appliance upgrade	86%	19%	55%
	Upgraded fridge	19%	2%	14%
	Installed powerboard	18%	1%	15%
	Installed EE lighting	17%	11%	7%
	Upgraded washing machine	14%	1%	8%
	Installed fans	12%	2%	8%
	Other	6%	9%	3%
Knowledge; Awareness	Increased awareness of energy efficiency	27%	15%	11%
	Educating self/others	6%	3%	1%
	Checking/reducing bills	2%	3%	1%
Curtailment behaviour	Turning off appliances	11%	48%	8%
	Adopting new energy efficient habits	6%	27%	4%
	Reducing air-conditioner use	2%	8%	1%
	Using EE heating/ventilation	1%	6%	1%
	Washing clothes in cold water	1%	6%	2%
	Checking fridge temperature	1%	6%	1%
	Reducing kettle use	0%	4%	1%
	Closing-off rooms	0%	3%	0%
	Disposing/halting energy use	1%	3%	1%
	Checking fridge seals	0%	3%	1%
	Checking energy-star rating	0%	2%	0%
	Reducing shower length	0%	2%	0%

Note: ES Only participants did not receive any modifications and/or appliance upgrade as part of the GHW Program. However, some participants bought new appliances and/or installed new features in the home while participating in the program.

The post-program interview shows that 39% (n=24) of those interviewed considered that they had made changes in their energy use as a result of their participation in the GHW program. The three main actions were to turn off appliances when not needed (n=10), to reduce reliance on air conditioning (n= 6), and to use power at off-peak periods (n=3). The remaining changes (each n=1) were to seek discounts from energy providers, to check fridges for leakages and accurate temperatures, to share the new knowledge within social circles, to zone off rooms to maintain cooled or warmed air, and to read electricity bills more carefully. Following their participation in the program, 17 of the 24 considered they had maintained these changes, while three considered they had not, and four participants did not respond.

Feedback on HEC service provided

Regarding the level of service from the field officer who conducted the HEC, the post-program interview respondents (N=53) rated it in order as excellent (n=24), very good (n=18), good (n=9) and fair (n=2). Where reasons were provided for these positive ratings, these included themes, in order from most to least cited, of the officer being helpful (n=11), having a professional manner (n=6), holding a strong knowledge of

energy consumption (n=5), and being prompt, patient and friendly (n=1 each). Quotes describing this satisfaction included:

> *'[She was] lovely and helpful. She not only did her job but seemed like she truly believed in helping people'* (HEC Only participant)

> '*The field officer was very easy to talk to, informative and a good communicator of information'* (HEC Only participant)

Regarding the level of service from the tradesperson and companies who delivered and installed the new appliances or devices for the HEC, the post-program interview respondents (N=43) rated it in order as very good (n=20), excellent (n=15), good (n=5). Where reasons were provided for the positive ratings (n=21), these were, in order, that the staff were polite (n=6), helpful (n=5), efficient (n=4), patient (n=3) and punctual (n=3). Many participants commented on the positive experience from engaging with BoysTown staff. The link with BoysTown was well received by respondents who reported appreciation for seeing this program in action for unemployed youth, and found them polite, helpful and patient. One such quote was:

> *'The guys from BoysTown came out. They were very polite, very helpful. Moved everything, put it all back in place'* (HEC Only participant)

> *'Super efficient program with delivery by BoysTown a stand out'* (HEC Only participant)

Feedback on ES program convenors

During the post-program interviews, the respondents who had been involved in the face-to-face ES groups were asked to rate their group's convenor. In general, respondents (n=8) ranked their group convenor very favourably, with excellent and very good ratings as equal top (n=3 each). However, two people rated convenors either as good (n=1) or fair (n=1), stating these convenors did not manage the 'chatterboxes' as well as participants had hoped. Quotes that positively described the convenor's skills were:

> *'[The convenor] kept the discussion going; got people talking'* (ES Only participant)

> *'Very enjoyable informative good instructors* (ES Only participant)

Feedback on ES program material

A few respondents (n=14; 7% of those who participated in an ES activity) provided comments regarding the ES materials when completing the post-program survey. Comments considered the magazines were well-presented, easy to follow, and valuable to keep or share with friends. They also considered that the video clips clearly communicated the messages, and were helpful for initiating the follow-on discussion.

This feedback was similar to the responses provided in the post-program interviews delivered to 5% of participants. All of the ES participants (ES Only; HEC & ES; ES Information groups) were asked for their opinion on the printed magazine and video stimulus materials. Of the participants who responded (N=16), the ratings in order were very good (n=8), good (n=4), Excellent (n=3) and fair (n=1). However, 9 participants who were in the HEC & ES Information group interviewed had not read the ES magazines. This suggests that the field officer delivering the HEC may not have drawn the participant's attention to the ES material provided at the time of the HEC.

Some quotes that described the positive impressions were:

> *'Good to take home and read- and to keep as an ongoing reference'* (ES Only participant).

'Wonderful- and it quoted how much an air con costs per hour compared to fans- and I wouldn't have any idea otherwise' (HEC & ES Information participant).

Organisational brand recall

During the post-program interviews, participants were asked (without prompting) to recall the names of organisations involved in delivering the GHW program. The predominant organisations recalled were those who had accessed the participants' homes as part of the HEC treatments. The main brands recalled were the Community Service Providers (n=19), the Good Guys (n=16) and Brisbane City Council (n=14).

Participants' recommendations for future programs

Changes to possible future versions of the GHW program were offered by a number of post-program interview participants (n=42).

From HEC participants, suggestions included:

- Introducing in-home displays for more homes to enable ease of energy monitoring and instant feedback
- Guidance provided for the newly installed appliances, including on how to use their new appliances in an energy efficient manner
- Measuring energy use of specific appliances, and having the HEC conducted by an electrician
- Ensuring appropriate match between household needs and appliance size, type and ease of use
- Greater attention with installation of appliances or other features
- HEC to include a fire safety check.

From ES participants, suggestions included:

- Finding quieter venues and confirming reservations
- Include additional material, such as focusing on gas usage
- Exposing corporate managers and politicians to the material in the ES magazines and video-clips.

Overall suggestions also included:

- Adapting the program for renters and a younger audience as program value within seniors is limited due to advanced age and limited years to recoup investment
- Simplify pre-program and post-program surveys questions
- Wider marketing of the program
- Having fewer contact points (organisations) involved to minimise confusion
- Government funding should focus on improving energy efficiency of business rather than focusing on individual households.

3.6 Convenors' feedback

Volunteer convenors for the EnergySavers behaviour change program were sought through advertising from Council, and through CSIRO's internship program with the University of Queensland. In total, 56 convenors were trained by CSIRO. Following this, 29 EnergySavers groups were convened, facilitated by a total of 16 convenors (as some convenors ran more than one group).

Convenor perspectives were sought after each of the four EnergySavers sessions for feedback on the overall program, logistics and attendance, as well as to answer or resolve any emerging questions or issues.

This section reports on the final convenor survey at the close of the program. It also includes relevant survey questions following sessions 1, 2 and 3.

An online survey, using the SurveyMonkey platform, was administered to all 16 active convenors following each of the four sessions. The responses provided by convenors were mainly open-text. Qualitative analytical techniques were applied to identify common themes throughout the responses. Table 14 shows the questions included in the convenors' session evaluations.

Table 14 Questions included in convenors' session evaluation

QUESTIONS	SESSION 1	SESSION 2	SESSION 3	SESSION 4
What has gone well?	✓	✓	✓	✗
What has been a challenge?	✓	✓	✓	✗
Do you have any questions for the CSIRO coordinator?	✓	✓	✓	✗
Was the CSIRO EnergySavers program a worthwhile experience for you?	✗	✗	✗	✓
What were the stand-out moments for you?	✗	✗	✗	✓
What needs to be changed or avoided in a later roll-out?	✗	✗	✗	✓
How closely did your discussions follow the material that was provided by CSIRO? (not an open question; response options provided)	✗	✗	✗	✓
Did you make any changes to the way you use energy at your home?	✗	✗	✗	✓
Please describe any changes that you made to the way you use energy at your home	✗	✗	✗	✓
Did any participants drop-out? If yes, do you know why?	✗	✗	✗	✓
How could CSIRO improve or adjust the CSIRO EnergySavers program to increase the value and satisfaction for the participants?	✗	✗	✗	✓
Are there any other comments you would like to make?	✓	✓	✓	✓

Value of the experience for convenors

All convenors (N=17) except one considered the experience to have been worthwhile. Three main reasons were identified from the 16 convenors who found the experience worthwhile:

- Increased knowledge on reduced energy consumption (n=6)
- Supported participants to empower themselves to control their energy consumption (n=5)
- Provided them with experience in facilitation (n=3).

The convenor who did not consider the experience worthwhile found that there were challenges with paperwork, and it was difficult to engage the participants in discussions.

Convenors were asked after each session to identify the aspects that had proceeded well. The main aspects identified were:

- Quality of discussion (n=31)
- Rapport created within the group (n=20).

The convenors were asked after the final session to reflect on the 'stand-out moments' of convening an ES group. Of the 26 responses, the main such moment was the quality of group discussion and the extent to which participants shared their experiences with each other (n=11). By participating in the program in the

role of convenors, 14 of the 16 total convenors also reported they had made changes to their own energy consumption.

Reflections on stimulus materials

The ES activity was run in four separate sessions, each of which used a magazine and two video clips to stimulate discussion among participants. The convenors reported that they did not deliver the program uniformly, although they were encouraged in their training to ensure that two video clips and one magazine were considered and reviewed in each of the four sessions. Of the 29 EnergySavers sessions, the majority (n=25) either closely or very closely followed the materials provided. The remainder (n=4) used the stimulus materials as a guide but did not cover or discuss all of the information provided.

The convenors provided mostly positive feedback on these stimulus materials. Two quotes that describe the responses to the materials were:

> *'The use of colour, and variety of display modes (graphs, etc) was appreciated by all.'*
>
> *'I would just like to congratulate CSIRO on the great work. I understand making material for this group with various knowledge and skills is not an easy task.'*

ES attendance

Twelve of the 29 EnergySavers groups had high levels of attendance, with participants of these groups attending at least three of the four sessions. Of the individuals who did not complete three or more sessions, 11 participants did not provide reasons. The reasons for discontinuation, where provided, were: forgot (n=6), on holidays (n=4), unwell (n=3), time didn't suit (n=3), disliked the program (n=1).

Convenor feedback on the incentives provided in the program (grocery vouchers and participation certificates) suggest that they appear to motivate session attendance. In addition, some of the convenors suggested additional incentives could be provided, such as energy efficient goods, or a HEC (for those who only received the ES activity).

Furthermore, the convenors also suggested that the program could be revised to better retain attendance levels by having fewer sessions (e.g. three instead of four sessions in total), weekly (instead of monthly) sessions to enable ease of remembering the event, more structured activities during the sessions, and aiming at a younger age group.

Challenges

Participants were asked to list the challenges of convening an ES group. The main aspects identified across the four sessions by convenors were (in order):

- Problems with venue (n=21)
- Difficult to engage all participants in a discussion (n=12)
- Time absorbed by surveys (n=10)
- Incomplete attendance by participants (n=10)
- Planning for the session (n=9)
- Maintaining participant discussions 'on topic' (n=6)
- Stimulus materials being too basic (n=5).

In conclusion, the ES convenors provided detailed and helpful feedback on their experience and perceived value of the program. Their responses supports feedback received from participants in the post-program surveys and interviews that, overall, the program was a valuable experience to them.

4 Discussion

Like most other developed nations, Australia's population is aging. Understanding the energy use of senior Australians, and assisting them to successfully balance energy costs with comfort and wellbeing, is an important component of broader governmental programs aimed at addressing energy efficiency in low-income households. In order to contribute to this important field of research, the Green Heart Wisdom (GHW) program was designed to explore the current energy use of low-income seniors, and trial two energy efficiency activities – a Home Energy Check (HEC) and CSIRO EnergySavers sessions (ES) - amongst this target population. This document has presented the results of an evaluation, conducted by the CSIRO, into the effectiveness of the GHW program in meeting its objectives.

4.1 Recruitment to the program

Recruiting participants for social programs is often a challenging task. Although few studies report on levels of recruitment and retention in energy efficiency programs, research in other domains indicates that the recruitment and retention of low-income individuals in community activity programs is often poor (Withall et al., 2011). Through the GHW program, the Brisbane City Council formed collaborative relationships with trusted groups and agencies with existing ties with the target population, with Community Service Providers, and with research organisations. This approach was a key factor in successfully delivering a community energy program and gathering household data from a large sample of low-income senior residents, and it serves as a lesson for future approaches.

While the program was highly effective in reaching its target population, there were still some difficulties recruiting and retaining participants to the CSIRO EnergySavers activity in particular. It is likely that this stems from the need to travel to a public place on set dates and times in order to join face-to-face group discussions. Although this program followed previous research recommendations on facilitating participation in social programs, such as the use of an easy and convenient venue, offering free or low-cost activities, and actively advertising the program in locations that are frequented by the target population (McDonald, 2010), the problems with recruitment for group-based activities could not be completely overcome. In order to improve recruitment targets and in response to challenges associated with recruitment, the ES activity was modified so that participants could be provided with the information included in the ES activity at home (rather than through group discussions on a public space). A further 20% of participants were recruited into the program as a result of this change.

It is also important to note that in order to reach recruitment targets, program design was changed and random allocation of participants into discrete treatments (HEC, ES, and a Control) was not implemented as originally intended. Such change imposes strong limitations on evaluating any program impact. The lack of random assignment means that the program evaluation cannot consider that participants in the different treatments are representative of the same population; in turn this makes direct comparison between the groups more tentative. Different program durations, and different start dates between treatments also make an adequate comparison of the activities impossible, due to seasonal influences on energy saving behaviour and consumption.

4.1 Meeting the program objectives

Objective 1: To test which of the selected activities had the greatest impact in terms of raising awareness and levels of understanding of energy efficiency, changing behaviour and attitudes towards energy efficiency, and changing energy consumption.

The GHW program trialled two approaches to providing information to low-income seniors to help build understanding of energy efficiency, as well as encouraging support for and adoption of energy efficient behaviours. Although a conclusive comparison between the two activities is limited (as discussed above, and in Section 2.6), the data shows an increase in participants' self-reported level of awareness, feelings of control and empowerment over energy consumption and the frequency of self-reported energy efficient behaviours after participation in both the HEC and the ES activities.

In terms of changing energy consumption, the electricity consumption for participants who participated in the HEC activity was significantly lower after participation in this intervention. This is expected, given the replacement of existing appliances in the homes with new energy efficient appliances. Further data analysis shows that the reduction in electricity consumption amongst these participants was most directly associated with the installation of CFL lighting and the replacement of the old refrigerator with a new, energy efficient model.

A comparison of mains gas consumption before and after the program activities showed that there were no statistically significant differences in mains gas consumption. Given that the program was targeted more at electricity than gas-based appliances, it is likely that any change in gas consumption prompted by the interventions was too small to reach statistical significance.

Despite the fact that participants reported an increase in their level of awareness, feelings of control and empowerment over energy consumption from participating in the program activities, such attitudes did not seem to be associated with reduced energy consumption post-program. This finding is in line with previous studies who have shown that self-reported attitudes do not always translate into behaviour (Kollmuss and Agyeman, 2002; Newton and Meyer, 2013; Steg, 2008; Yohanis, 2011).

In addition, given that energy consumption amongst participants was already low at the beginning of the program, it may be that there was insufficient scope for further reductions in consumption to be large enough to show more meaningful changes over time. There are obviously limits to how much reduction in energy consumption is possible in a typical house with multiple energy-driven appliances. At such a point, behaviour-based changes cannot realistically yield meaningful further reductions in consumption, and only replacement of old, inefficient appliances with new, more efficient models can have an impact.

Program Objective 2: To improve the energy efficiency of low-income seniors' homes and contribute to their health, well-being and ability to remain in their homes.

The results of this evaluation show that a significant reduction in household energy consumption was associated with the replacement of an old refrigerator with a new, energy efficient model and the installation of CFL lighting through the HEC activity, suggesting that these modifications can assist with improving the energy efficiency of low-income seniors' homes. Participants who received a HEC activity were understandably appreciative of the HEC modifications, with the majority of those participants stating that the appliance and/or modifications installed were the most significant outcome(s) from their participation in the program. Several participants also provided qualitative feedback about the perceived impact of the appliances and/or modifications on their level of comfort and well-being.

The impact of program activities on participants' well-being varied greatly between treatments. This may well be because data on levels of comfort was strongly related to thermal comfort, and was therefore influenced by the time of the year when data was collected. For example, results show that HEC Only and ES Only treatments were the most effective in improving participants' level of home comfort without heating and cooling appliances. This might be because post-program survey data for HEC Only and ES Only was mostly collected in Spring when temperatures are mild. On the other hand, participants in the ES Comparison and HEC & ES Information groups reported lower levels of comfort at home without air-conditioning and/or heating appliances at the end of the program. Post-program survey data for ES Comparison and HEC & ES Information groups was collected mostly during summer months where households are more likely to need air-conditioning for thermal comfort. This results show the importance of conducting treatments concurrently, as energy consumption and program evaluation will both vary at different times of the year.

Program Objective 3: To help low-income seniors manage energy costs by better managing energy consumption.

Across all activities, the program yielded a significant decrease in electricity costs and emissions. Aggregated across the 1198 participants in these groups, this equates to an estimated total saving of $35,184.52 per year in electricity costs, and a total reduction of 96.93 tonnes per year in carbon-equivalent emissions.

Results show that the program was effective in reducing household energy costs for participants who received a refrigerator upgrade and/or installed CFL lighting. This finding suggests that when offering appliances upgrade, the potential energy reduction resulting from different appliances plays a key role in reducing household energy consumption. For example, participants who received a refrigerator upgrade had significantly reduced their electricity bills, while those who opted for a washing machine did not. This finding is probably because the potential energy reduction resulting from a refrigerator upgrade is larger than washing machines. Refrigerators account for around 18% of household appliance energy consumption, while washing machines only account for 2%.

Results also suggest that the program had an overall positive impact on helping seniors manage energy costs, as the HEC Comparison participants showed an <u>increase</u> in energy consumption over the same period. As temperatures were hotter in the post-program period (Oct 14 to Mar 15) when compared to the pre-program period (Oct 13 to Mar 14), seniors could be expected to increase their use of cooling systems post-program for thermal comfort. Therefore, the fact that participants who received a program activity did <u>not</u> increase their energy consumption post-program suggests that the program activities might have improved participants' capacity to control their energy usage, especially within participants who were recruited by CSP-providers and who received a HEC. However, as participants were recruited by different agencies and not randomly assigned to treatments, those assumptions cannot be confirmed via statistical analyses.

Program Objective 4: To inform future local, State or Federal government energy efficiency policy and program initiatives amongst this target population.

Program data shows that thermal comfort is a key area for improving the energy efficiency and comfort of low-income seniors. Home thermal comfort plays a key role in maintaining participants' wellbeing, with 70% of participants relying on heating and cooling appliances for thermal comfort. Program data also suggests that the penetration of air-conditioning in seniors' home can be expected to increase amongst the senior population over time. Within our sample of participants, older participants (80 years and above) were less likely to have air-conditioning at home when compared to younger participants (under 80 years).

As the population continues to age, we thus expect that penetration of air-conditioning will similarly rise over time. Heating and cooling appliances can account for 40% of household energy consumption, and therefore the energy efficient use of those systems is very important to assist households in managing their energy costs.

Program data shows that participants were not using use their heating and cooling systems efficiently at the start of the program (for example, temperature settings were too high or low depending on the season). The program aimed to improve participants' awareness and behaviour regarding the energy efficient use of heating and cooling systems by providing information about the optimal temperature settings for winter and or summer. Such information had a positive impact within HEC Only and ES Only participants, which reported an increase in the frequency of setting the air-conditioner to 25^{o}C or more in summer. However, a large number of participants were still reluctant to adopt such recommendations. Qualitative data received from ES convenors suggests that the program-recommended temperatures for energy efficient use of heating and cooling systems do not provide thermal comfort to this target audience. There might be a discrepancy between the typical advice of energy efficient experts regarding what constitutes 'ideal' energy efficiency behaviour, and the expectations of senior households regarding the use of their appliances for maintaining thermal comfort.

Program data also suggests that participants' perception of thermal comfort shifts once the household has access to air-conditioning. Participants who do not have an air-conditioner at home reported higher levels of comfort without heating and cooling appliances when compared to participants who did have an air-conditioner at home. In addition, participants who used air-conditioners and/or reported lower levels of comfort without heating or cooling appliances were less able to reduce their energy consumption during the program. This finding suggests that, as air-conditioning use becomes the norm, interventions that specifically encourage the energy efficient use of such appliances are essential for improving the energy efficiency of low-income seniors' homes.

4.2 Participants' satisfaction with GHW program

Overall, participants considered that their participation in both HEC and ES activities was a positive experience, with the vast majority of participants expressing satisfaction in the program. Those who received a HEC and received energy efficiency measures (such as an appliance upgrade or other modification) were most appreciative of the energy efficient modifications and/or appliances received, and a large number of HEC participants were also appreciative of the new energy efficient knowledge and awareness they acquired. The most significant outcomes for participants in the ES Only activities were the reinforcement or adoption of energy saving habits, as well as an increased energy efficiency awareness.

4.3 Cost-benefit and cost effectiveness analyses

Overall, the GHW program yielded a small positive benefit-cost ratio (0.016). Of the five intervention groups, the HEC only and HEC & ES Information activities showed a small positive benefit-cost ratio. These activities yielded benefits, but the costs of delivering these interventions (reflecting the cost of replacement appliances as well as in-home assessments) is high compared to the annual estimated benefit gained in reduced electricity bills. It is noted that such analyses cannot incorporate important non-monetary benefits like participant well-being, environmental impacts of reduced emissions, and the mitigation of the impact of likely future prices rises for electricity.

The HEC and ES Information activity provided the strongest benefit-cost ratio (0.033) and the best cost-effectiveness ratio ($11,037 per tonne of abated carbon emissions). This activity, in combining both appliance replacement and the information from the EnergySavers program, appears to yield more cost-effective impact than either of these activities conducted alone. It may be the case that this combined intervention was most effective at yielding all potential reductions. Replacement appliances will have yielded benefits even for people who had already implemented what behavioural changes are possible, and conversely, information that identified and prompted behaviour changes would have yielded benefits even for people who already owned more efficient appliances.

4.4 Social and economic benefits

In addition to the environmental and financial outcomes achieved through Green Heart Wisdom, the program also delivered a range of additional benefits for participants and partner organisations.

4.4.1 KEY SOCIAL BENEFITS ACHIEVED

i. **Key social outcomes for participants**:

- *Re-engagement of participants with CSPs* - Green Heart Wisdom provided CSPs with the opportunity to re-engage with clients and identify further support that might be provided to them. The continued support of the CSPs to the participants after the program's conclusion could contribute to them being more comfortable and able to stay in their home for longer.
- *Social capital through HECs* - the one-on-one visits by CSP staff to the homes of participants through the HECs provided valuable social contact and support.
- *Referral to other agencies* - anecdotal reports from CSPs suggest that the home visits provided the opportunity for participants to be referred to other community service providers/agencies for support. These referrals would provide further assistance to participants, potentially furthering their capacity to stay at home longer and more comfortably.
- *Social engagement* – EnergySavers provided the opportunity for seniors to meet face-to-face with their peers, facilitating valuable social contact.
- *Financial* – as described in this report, Green Heart Wisdom provided significant financial benefits to participants. By enabling them to access energy efficient modifications and appliances, at low or no cost, on-going cost savings would be achieved.
- *Thermal comfort* – energy efficient modifications such as fans would improve the thermal comfort of participants' homes.

ii. **Key social outcomes for BoysTown clients**

- *Training and work opportunities for BoysTown clients* - BoysTown clients were engaged to deliver appliances and recycle old machines and this resulted in the following benefits:
    - Development of skills and work capabilities of a group of 37 at risk and marginalised young people

- Fourteen participants re-entered the workforce prior to the end of the program, and a number shortly post-program
- Twelve young people obtained further workplace training through which they completed Certificate II in Warehousing and Fork-lift Operator's licensing.

- *Confidence building for BoysTown clients* - the esteem, social skills and confidence of the young people participating in the program was enhanced through interaction with participants and through the mentoring opportunity provided by one-on-one time in the removal truck with BoysTown trainers.

iii. **Key outcomes gained for the Community Service Providers**

- *Increased project delivery skills* - through their involvement in Green Heart Wisdom, the CSPs increased their project delivery experience and their capacity to partner with government and other agencies on large initiatives.
- *Energy efficiency skills* - CSP staff received training in energy efficiency, enhancing their capacity to provide additional quality services, creating benefit for their clients, their funding bodies and the broader community.

4.4.2 KEY COMMERCIAL AND ECONOMIC BENEFITS

iv. Key outcomes from BoysTown partnership

- *Supporting BoysTown revenue* - BoysTown is a social enterprise which provides services for young people and their families. The Green Heart Wisdom program was undertaken utilising the existing assets and staff of BoysTown's Recycling Enterprise, generating a revenue flow. This assisted the Enterprise to continue operating and provided real work experience and training to BoysTown clients.
- *Building capacity of BoysTown* – the organisation gained new experience and strengthened their reputation in managing and delivering this type of program. Following its involvement in Green Heart Wisdom BoysTown has gone on to partner with other programs, such as the *"Reduce Your Juice"* campaign (also funded through LIEEP).
- *Reducing unemployment* - developing the work-readiness of a group of young people enhances the economy by shifting them from welfare-dependency to the financial independence of employment.
- *Reducing waste going to landfill* - by recycling old appliances and packaging, BoysTown diverted 64,064kg of waste from landfill. Table 15 presents a summary of the waste that was diverted from landfill. This included polystyrene, cardboard, plastic and appliance components. The disassembled steel, plastic, copper and circuit boards of the old appliances were recycled through certified recyclers. Almost all components of the old appliances were recycled.

Table 15 Waste diverted from landfill due to appliance and packaging recycling

PACKAGING			DISASSEMBLY	PROGRAM TOTAL
Kg Polystyrene	**Kg Cardboard**	**Kg Plastic**	**Kg (total components)**	**Kg Diverted from Landfill**
624	4,360	80	59,000	**64,064**

v. Key outcomes from The Good Guys Capalaba partnership

- The Good Guys strengthened its reputation as a socially aware company, increasing customer loyalty.
- Through the provision of energy efficient appliances the program supported this industry.

4.5 Project Operation, Processes and Administration

The following section provides details regarding how each of the Activities was delivered, specifics of the recruitment strategies employed and partnerships that were essential to deliver the program. The contractual arrangements to set up the project and the processes put in place to help ensure the project remained on track are also referred to.

1.1 EnergySavers only GROUP

Overview

Brisbane City Council partnered with CSIRO, to deliver the EnergySavers behaviour change component of Green Heart Wisdom. The EnergySavers model, adopted a 'round the table approach' to help seniors learn about implementing sustainable energy efficient practices in friendly, supportive group sessions, facilitated by a trained convenor. The program aimed to determine whether participants learned more effectively in a group situation where meaningful discussion and understanding was encouraged, compared to participating in an individual Activity.

The Activity provided the added benefit of social interaction and community involvement for seniors, which was identified as an important benefit for this group.

Participants were required to attend at least three out of four EnergySavers workshops over a four month period.

1.1.1 STAKEHOLDER ENGAGEMENT

CSIRO developed the delivery methodology and the educational materials for the EnergySavers program. The team also provided ethical guidance and clearance of the documentation provided to participants. This included a participant information sheet which served to give confidence to the participant that their energy use data and program responses would only be used for the purpose of the Green Heart Wisdom program. The professional nature of the documentation served to communicate the integrity of the program, giving participants confidence to share their energy efficient behaviours, attitudes and power use for the purpose of the program.

1.1.2 RECRUITMENT STRATEGY

Recruitment to the EnergySavers groups was undertaken by Brisbane City Council staff. Participants were recruited from existing Community Interest Groups, such as Men's Sheds. Since participants already knew each other it was anticipated that open and relaxed group discussion, which was a requirement of this Activity, would be facilitated.

A list of Community Interest Groups for the 60 plus age group within the Brisbane City Council Local Government Area (BCCLGA) was compiled and telephone calls made to the groups to promote the program

and book a time to talk to the members about the EnergySavers program. Telephone calls were made to over 150 Community Interest Groups, with 29 groups deciding to participate in the EnergySavers program. Seniors were also encouraged to become group convenors.

During the presentation, participants were given details of the program eligibility criteria, the level of commitment required of a participant and details of the energy efficiency benefits and incentive they could attain from participating.

Each group required a minimum of eight participants. Once a group was formed and individual participants recruited to the program, they were advised of the dates and times when the EnergySavers workshops would be delivered, each being a month apart. The relevant bookings were made and program information was posted to the participant for them to complete at home and bring along to the first session.

Convenors

The EnergySavers sessions were delivered to participants by volunteers who were recruited and trained to convene the sessions. Convenors were given training in the subject matter as well as techniques to facilitate and stimulate discussion within their groups. The Convenor was responsible for collecting completed participant consent forms and their completed pre and post program surveys. As an incentive to recruit Convenors and as a reward for their time commitment, Convenors received a grocery voucher, in return for leading four sessions.

Over 70 prospective Convenors expressed interest in joining the program, with 56 people attending training. Sixteen Convenors ended up delivering the program at the scheduled workshops, with some convenors running more than one group. CSIRO trained the convenors and provided them with information to take home and review, including notes on the monthly topics, EnergySavers magazines and the videos which they would show at the sessions.

1.1.3 DELIVERY OF ENERGYSAVERS SESSIONS

Once eligibility was confirmed the participant was presented with the program information sheet, privacy notice and participant consent form, and appointments made for their attendance at up to four EnergySavers sessions over a four month period.

Participants were asked to complete their participant consent form, which included their NMI or MIRN account details, and bring it with their pensioner concession card to the first EnergySavers workshop.

At the first EnergySavers workshop the Convenor was required to sight the pensioner concession card, collect the signed participant consent form, check the NMI and MIRN data had been provided and record these actions. Pre-program surveys were then distributed to the group.

As experts in energy efficiency behaviour, CSIRO created the pre-program survey and the post-program survey, crafting questions on a five point Likert scale. Respondents specified their level of agreement or disagreement on a symmetric agree-disagree scale for a series of energy efficiency attitudinal and behavioural questions.

Upon completion of the pre-program survey the participant was then engaged in group discussions about an EnergySavers topic. Each workshop had a theme, supported by an EnergySavers magazine, video and discussion points.

At the final workshop, the Convenor asked participants to complete a post-program survey. Providing the participant had completed the pre and post-program survey, completed their consent forms and attended three of the four workshops, they were awarded a grocery voucher to thank them for their participation.

They also received a certificate to promote their achievement, acknowledging the effort made to attend and their commitment to changing their energy behaviour.

1.2 Home Energy Check only

Overview

Brisbane City Council partnered with five Community Service Providers (CSPs) to deliver Green Heart Wisdom Home Energy Checks to low income seniors within the BCCLGA. Each CSP was required to resource the program by allocating sufficient staff to manage their quota of clients. In most cases this was a minimum of an Administration Officer for participant recruitment and administrative tasks and a Field Officer to deliver the Home Energy Check within the participant's home.

Trained Field Officers used a Samsung tablet to access the CSIRO pre-program survey with a software application, called 'Runabout' to collect data for the Home Energy Check. The Runabout software allowed the Field Officer to ask the participant questions about their energy behaviours, record details of in-home appliances such as washing machines, fridges and air-conditioners, and record the status of items inspected such as fridge seals, fridge temperature, curtains, blinds, the type of lighting used and information about laundry, cooling and heating used within the property.

1.2.1 STAKEHOLDER ENGAGEMENT

The following Community Service Providers were contracted to deliver Home Energy Checks (HECs) to low income seniors in Brisbane:

- Anglicare Southern Queensland – Home Assist Secure
- Burnie Brae Home Maintenance
- Churches of Christ Care Queensland
- Communify Queensland
- Sandgate and District Home Assist

Each contract stated the number of participants the CSP agreed to recruit and the dates by when delivery milestones needed to be met. In addition to recruitment milestones and delivery dates, the contract also stated in-home modification specifications to ensure that the partners installed approved energy efficient products within participants' homes.

The commitment of the CSPs to deliver the program to their clients was crucial for the success of Green Heart Wisdom. CSPs worked tirelessly to recruit participants, collate paperwork, complete pre and post program surveys, manage software systems and co-ordinate the ordering and delivery of in-home modifications to eligible participants.

1.2.2 RECRUITMENT STRATEGY

The recruitment strategy for the Home Energy Check activity was to leverage the existing relationship that Community Service Providers had with their clients. The CSPs were well placed to support the program as

they had extensive databases of contacts and their clients frequently met the eligibility criteria for the program.

The relationship that the Community Service Providers had with their clients was invaluable, since they were already valued as trusted agencies by their clients. Each CSP was supplied with a Call sheet which listed a group of identification numbers, unique to their organisation. This helped identify which activity and CSP the participant information related to.

Recruitment process:

- CSP Administration staff downloaded participant contact details from their organisation's database and transferred the relevant information to the Call sheet.
- The Administration Officer worked through the contacts on the Call sheet, telephoning prospective participants to recruit them to the program.
- Upon commencing a recruitment call the Administration Officer clicked a link within the Call sheet that launched a script to guide them through the recruitment process. The content of the script was approved by the CSIRO Ethics team to ensure communication with the participant met with ethical requirements.
- The recruitment script featured a series of web based forms that:

  i) explained the program to the participant

  ii) checked their eligibility

  iii) confirmed address details for distributing participant materials.
- If the participant expressed interest in joining the program, an appointment for the Home Energy Check was booked.
- Upon completion of the phone call, the Administration Officer posted or emailed the program information, privacy notice and participant consent form to the participant.
- The participant was required to complete the consent form and return it to the CSP.

1.2.3 DELIVERY OF HOME ENERGY CHECKS

HEC Tools and Materials

Each CSP was supplied with a range of tools and guides to support them in delivering the Home Energy Check. These tools included:

- **Samsung tablets** – these were loaded with the 'Runabout' software which enabled CSP Field Officers to record responses to a series of questions relating to each home's energy efficiency and provided recommendations for improvements. Field Officers also accessed the pre and post survey via the tablet.
- **ASAP software** – this was downloaded onto CSP computers and enabled them to make and track appointments, record details of a participant's engagement with Green Heart Wisdom, including modifications installed, and manage invoices and program reports.
- **CSP Home Energy Check Instruction Manual** - included step by step instructions for delivering a HEC, copies of all program forms, responses to frequently asked questions, instructions for using the 'Runabout' software, instructions for operating ASAP (the database system), and supporting tools, to ensure that officers could confidently respond to questions asked by participants.

- **Participant Manual** - was provided to each participant. The manual included information about the program, forms, information about supporting services (eg NILS) and the products available to participants through the program. The manual was left with participants enabling them to take time to consider if they wanted to participate and to share information with their family and friends.

HEC process

The Field Officer arrived at the participant's home at the allocated appointment time for the Home Energy Check. The officer sat down with the participant, ensured they understood the Participant Information Sheet, and requested that they sign the consent form before proceeding further. They then conducted the pre-program survey with the participant and undertook a check of the home, using the tablet to record the responses.

During the Home Energy Check the Field Officer documented lighting, electrical equipment and appliances in the home and discussed the participant's energy behaviours and their power bills. The information was collected via the tablet and automatically transferred to the program's ordering database, ASAP.

Once the Field Officer completed the Home Energy Check process, the software produced a report that recommended energy efficient actions that, if implemented, could help to improve energy efficiency within the participant's home.

Green Heart Wisdom actions were calculated based upon the data that the Field Officer collected during their assessment of the home. For example, if the home had halogen lighting in the primary used rooms, then a recommended Green Heart Wisdom action may be to replace it with LED lighting.

Participants were eligible for up to $390 worth of energy efficient products, plus up to $200 worth of labour for installation of the modifications. Eligible participants were also able to purchase a highly discounted energy efficient appliance.

Appliance and modification paperwork, ordering and program compliance was managed by the CSP Administration Officer and Field Officer. CSPs managed the installation of modifications by contracting qualified electricians for any electrical installation (LED lighting, ceiling fans and connection to an off peak tariff) and in-house handymen to install powerboards, CFL light bulbs, or door and window seals.

A follow up appointment was booked four months after the Home Energy Check. At this appointment the Field Officer worked with the participant to complete the CSIRO post-program survey.

Energy Efficient Appliances

If a participant owned an old (over 10 years) energy hungry fridge or washing machine they were potentially eligible for a replacement energy efficient appliance at a cost to them of only $125. The Good Guys Capalaba received appliance orders by email from the Runabout tool and managed the $125 payment directly with the participant. The Good Guys ordered the appliance and coordinated the delivery of the new appliance to the participant's home, through BoysTown - the program appliance delivery partner.

A small number of participants were eligible to receive a discounted energy efficient air conditioner to replace an existing machine. Participants who were signed up to the Medical Heating and Cooling Electricity Concession Scheme (QLD) or in receipt of the Essential Medical Equipment Payment (FED) were eligible for the purchase and installation of a PeakSmart air conditioner, for a total cost to them of $125.

Connection to off peak tariff

Green Heart Wisdom aimed to achieve financial as well as energy efficiency outcomes for participants where possible. Since hot water systems are a key contributor to electricity costs, savings of up to 50% could potentially be achieved by connecting a hot water system to an economy tariff.

Through Green Heart Wisdom, participants who owned an electric hot water storage system were eligible to be connected to an economy off peak tariff at no cost to them. Participants were eligible if they had an electric hot water system switched from a Tariff 11 to Economy Tariff 33 or Super Economy Tariff 31.

1.3 Energysavers Comparison Group

Overview

During the funding agreement negotiations, the Department of Industry, Innovation and Science requested recruitment of an EnergySavers Comparison Group. The results of this group could then act as a baseline with which to compare the outcomes of the EnergySavers Activity.

1.3.1 RECRUITMENT STRATEGY

Recruitment to the EnergySavers Comparison group was undertaken by Brisbane City Council staff.

The following channels were used to recruit participants to this group:

- Some EnergySavers Comparison group participants were recruited from people who had attended an EnergySavers presentation at a Community Interest group meeting, but had advised they did not want to participate in the workshops. In this instance participants were added to the prospective EnergySavers Comparison group list and were later contacted to offer them the opportunity to be involved as a Comparison group participant.
- 'Growing Old and Living Dangerously' (GOLD) is a series of free or low cost activities for Brisbane residents, aged 50 or over, run by Brisbane City Council. Officers contacted the GOLD Program Coordinator and gained permission to attend a wide range of the events throughout Brisbane to recruit participants.
- 'Your City Your Say' (YCYS) is a community reference panel of Brisbane residents who receive regular information about Council activities. Information about Green Heart Wisdom and how to participate as a Comparison Group member was included in the YCYS regular newsletters and monthly email.
- Taigum 10th Anniversary Ageing Expo was attended by staff from the Green Heart Wisdom team, which hosted a stand at this two day event, held at Taigum Square Shopping Centre.

At recruitment events, the Council officer presented a short overview of the program, checked eligibility, attained contact details, sighted the pensioner concession card and either distributed the participation information sheet, participation consent form and pre-program survey to the participant at the event, or agreed to post the information out.

The EnergySavers Only program was originally promoted via GOLD and YCYS. Only once the EnergySavers recruitment period had passed did Council use these channels and the Ageing Expo to recruit for the Comparison group, as recruiting the maximum numbers for the EnergySavers Only program was considered the priority.

1.3.2 DELIVERY OF ENERGYSAVERS COMPARISON GROUP

Once a participant was signed up, their information was entered into the EnergySavers Comparison group Call sheet and each participant allocated a unique identification number.

Participants were required to take the participant consent form and pre-program survey home, complete them and return to Council by mail.

The date when the participant consent form and completed pre-program survey was received by Council was recorded and a note made to contact the participant four months later to complete their post program survey.

Once the signed participant consent form, the pre and post program surveys had been completed, the participant was posted a grocery voucher to thank them for their time.

1.4 Home Energy Check Comparison Group

Overview

During the funding agreement negotiations, the Department of Industry, Innovation and Science requested recruitment of a Home Energy Check Comparison group. The results of this group could then act as a baseline with which the Home Energy Check Activity could be compared.

1.4.1 STAKEHOLDER ENGAGEMENT

Brisbane City Council engaged Blue Care to recruit participants to the Home Energy Check Comparison group.

Blue Care originally partnered with Council to deliver Home Energy Checks during the November 2013 pilot. Blue Care made a valuable contribution to the pilot, but opted out of delivering the Home Energy Checks for the main part of the program.

Blue Care's prior program knowledge was beneficial, allowing it to quickly assemble a team and commence delivery.

1.4.2 RECRUITMENT STRATEGY

Blue Care had a database of clients that met the eligibility criteria for the program. As with the other partners, it already had a trusted relationship with these prospective participants, which facilitated the process of recruitment.

1.4.3 DELIVERY OF HOME ENERGY CHECK COMPARISON GROUP

Blue Care was issued with a Call sheet featuring a series of participant identification numbers and populated this sheet with a list of contacts from its own database.

Blue Care contacted participants by telephone using the Call sheet to record their details and link to the Screener script to confirm eligibility, address details, share information about the program and then co-ordinate the postage of the participant information sheet, participant consent form and the pre survey.

A note was recorded in the Call sheet to contact the participant four months later. The post program survey was then carried out by telephone. As with the EnergySavers Comparison group, once the signed participant consent form, the pre and post program survey had been completed, the participant was posted a grocery voucher as a thank you for their time.

1.5 Reporting processes

Q&A Market Research supplied weekly reports that were used to monitor delivery of the Green Heart Wisdom program against milestones. This information was sent as a weekly email to the CSPs. It reported how they were progressing and also shared updates such as adjustments to program delivery, resolution to system queries, adjustments to the process or new tactics and methods for recruitment that needed to be implemented. Program issues and risks were managed via a formal process, whereby the Council delivery team met once a week to discuss progress and address these. The project manager also had weekly calls with the CSP managers to discuss and work through any challenges in meeting milestones.

The Green Heart Wisdom team worked closely with CSP partners throughout the program, using the following strategies to help ensure milestones were met:

- Weekly reports were emailed to highlight progress against milestones.
- The weekly report included additional information, such as program reminders and issue resolutions.
- A telephone call was made to each CSP by Council staff following the weekly email to discuss progress and whether any additional support was required to help with program delivery.
- Additional training was provided to CSPs when necessary.
- Telephone support was available from the Green Heart Wisdom team, to help resolve any Home Energy Check delivery issues or respond to participant questions.
- PGA staff were available to resolve any technical questions relating to operating the “Runabout” software.

Regular communication with partners and CSPs helped to ensure delivery milestones were met. Prompt responses to queries ensured the program was promoted positively to clients resulting in our partners’ continued demonstration of an ‘above and beyond’ attitude.

1.6 Program delivery variations

During program development it was expected that participant recruitment to EnergySavers or the Home Energy Check activity would exceed the agreed milestones. The Department of Industry, Innovation and Science requested that the program form an additional group whose participants received both the Home Energy Check and EnergySavers. It was anticipated that this would improve the breadth of data available for analysis purposes. This variation would allow Green Heart Wisdom to deliver and attain data from the following groups:

i) Home Energy Check Only group

ii) EnergySavers Only group

iii) Combined Home Energy Check & EnergySavers group

iv) Home Energy Check Comparison group

v) EnergySavers Comparison group.

1.6.1 HOME ENERGY CHECK & ENERGYSAVERS GROUP

Forming a combined Home Energy Check & EnergySavers group provided the opportunity to determine whether participants who received the benefits of both activities would have a greater energy efficiency improvement than a participant who received a single activity. Participants in this combined group were eligible to receive the installation of energy efficient modifications, replacement of an energy hungry appliance and the opportunity to attend four EnergySavers workshops.

Council partnered with Centacare to deliver the combined Home Energy Check & EnergySavers activity to low income seniors. Centacare had a large client base of eligible participants, a number of venues where the EnergySavers sessions could be held and also had access to transport, so were able to pick up participants and take them to the EnergySavers workshops.

Communify had already committed to deliver Home Energy Checks to participants and in support of the program agreed to extend its contract to deliver the combined Home Energy Check & EnergySavers activity to additional clients.

Call sheets were drafted for the Communify and Centacare combined activity. Participant details were entered into these and telephone calls were made to recruit participants who met the eligibility criteria.

The Community Service Providers telephoned prospective participants and the relevant information was sent to them to review and sign up to the program. During the conversation an appointment for their Home Energy Check was made and the participant was asked to identify dates when they could attend the four EnergySavers sessions, each a month apart, over a four month period. The activity was structured so that the participant first received a Home Energy Check, followed by attendance at the four EnergySavers workshops.

1.6.2 ENERGYSAVERS CITY HALL EVENTS

Recruiting participants to the EnergySavers group and the combined Home Energy Check & EnergySavers groups proved more challenging than expected. Committing to four EnergySavers sessions, plus coordinating transport to the venues, proved to be a barrier to engaging participants and keeping them engaged with these activities.

In order to help increase recruitment to the EnergySavers and Home Energy Check & EnergySavers groups, Council hosted a series of sessions at Brisbane's City Hall, attended by multiple groups. To encourage participation, the events provided morning tea, lucky draw prizes and transport to the venue. The opportunity to win an energy efficient appliance was also included. Participants signed up to the events via an online registration system.

Promotion

The City Hall events were promoted via the following channels:

- Council's Facebook and Twitter accounts
- a dedicated edition of Council's Green Heart Life e-newsletter was sent to approximately 45,000 subscribers
- Consortium partners, including Council on the Ageing (COTA), the Australian Pensioners' and Superannuants' League and National Seniors Australia were asked to promote the events to their members, via their newsletters, websites, social media accounts and meetings.

1.6.3 ENERGYSAVERS GROUP VARIATION

In October 2014, to further increase recruitment to the EnergySavers activity, Council proposed a variation to the delivery of the EnergySavers program. Eligible participants would be posted the four magazines to review in their homes, rather than attending a group session.

This decision was proposed because organising groups of up to eight participants, coordinating transport and booking a venue for four dates, a month apart, and requiring commitment from the participants to attend, presented too many variables for the number of participants that were interested in this activity.

Centacare also adjusted delivery of their Home Energy Check & EnergySavers activity so participants would receive the Home Energy Check and be given the four EnergySavers magazines to read at home. This was approved by both CSIRO and the Department of Industry, Innovation and Science.

Variations to Green Heart Wisdom activities.

Original Activity	Variation to Activity	Variation Description
Home Energy Check & **EnergySavers Group**	Home Energy Check & EnergySavers **Information Only**	• EnergySavers behaviour change program delivered to the home as printed materials rather than attendance at four group discussion sessions • Home Energy Check with options for retro-fit and an energy efficient appliance • Pre and post activity survey and collection of NMI and MIRN energy data.
EnergySavers Group **Only**	EnergySavers **Information Only**	• EnergySavers behaviour change program delivered to the home as printed materials rather than attendance at four group discussion sessions • Pre and post activity survey and collection of National Meter Identifier (NMI) and Meter Installation Reference Number (MIRN) energy data.

4.6 Budget overview

The project was delivered within budget and the approved timeframe. All expenses were managed against the expense item listed within the funding agreement. Monthly expense analysis was carried out to ensure that expenditure remained within the allocated amounts. Where an increase or decrease to an expense item was required, Brisbane City Council worked with the Department to attain approval.

The program expenditure, in terms of DOIS funding, is itemised in Table 16 below. The In-kind contributions made available from Brisbane City Council, BoysTown, CSIRO and The Good Guys Capalaba are recorded below.

Table 16 Total Green Heart Wisdom expenditure Note: Values are rounded to the nearest $1.00

	Budget item	Budget	Final Expense	Variance (Budget - Final expense)
1	Home Energy Check - assessment of Home, client advice, referrals	$183,311.00	$183,311.00	$0.00
2	Labour Costs for Home Modifications	$166,069.00	$166,068.75	$0.25
3	Material costs for Home modifications	$145,208.00	$145,238.17	-$30.17
4	Subsidy on Energy efficient fridges	$211,931.00	$206,006.21	$5,924.79
5	Subsidy on Energy efficient Washing Machines	$208,113.00	$205,615.78	$2,497.22
6	Subsidy on Energy efficient air conditioning	$1,147.00	$1,511.82	-$364.82
7	Control and Energy Saver Groups reward	$55,600.00	$54,131.39	$1,468.61
8	Delivery of appliances	$87,900.00	$85,100.00	$2,800.00
9	Washing Machine and Fridge installation	$0.00	$0.00	$0.00
10	Air conditioner installation	$1,467.00	$1,102.73	$364.27
11	Switch to off peak tariff	$0.00	$0.00	$0.00
12	Project Co-ordination costs	$208,424.00	$252,330.79	-$43,906.79
13	EnergySaver logistics resource	$91,078.00	$91,077.62	$0.38
14	Training HAS officers to carry out HEC	$136,202.00	$136,086.69	$115.31
15	Marketing Materials, resources and electronic tool	$23,748.00	$23,680.21	$67.79
16	CSIRO ES program development	$271,611.00	$241,934.00	$29,677.00
17	Printing of CSIRO EnergySavers magazines	$26,750.00	$26,750.00	$0.00
18	CSIRO EnergySavers Focus groups	$3,900.00	$3,900.00	$0.00
19	Lunch for CSIRO convenors	$2,400.00	$2,400.00	$0.00
20	Field agency data and collection and database development costs	$69,005.00	$69,005.00	$0.00
21	EnergySavers participant recruitment and administration	$92,518.00	$95,697.40	-$3,179.40
22	Contribution to transport costs for EnergySavers	$5,622.00	$2,226.42	$3,395.58
23	Food and Beverage for EnergySavers participants	$4,985.00	$4,985.23	-$0.23
24	Participation reward for EnergySavers convenors	$5,650.00	$5,650.00	$0.00
25	Administrative costs and room rental charges for EnergySavers	$9,861.00	$7,926.43	$1,934.57
	Total	$2,012,500.00	$2,011,735.64	$764.36

Whole of project – partner in kind contributions

	Partner	Contribution
1	Brisbane City Council (in-kind)	$249,428.77
2	CSIRO (in-kind)	$60,116.00
3	BoysTown (in-kind)	$124,000.00
4	The Good Guys (in-kind)	$207,553.00
	Total contributions (in-kind)	**$641,097.77**

As a research project it was necessary to run two financial systems. These were the Brisbane City Council system and ASAP, which was the Home Energy Check in-home modification ordering system. All products were ordered via Runabout, with order details passed to ASAP for procurement, installation and invoicing. These orders also needed to be processed, along with all program costs through the Brisbane City Council finance system. Administration of ASAP and also management of the seven Community Service Provider contracts was time consuming and complex. Management of supplier contracts for Q&A Market Research, CSIRO and PGA also required more time than anticipated.

There were some areas of complexity, that to resolve, required the allocation of in-kind resources to the project. In these instances administration accuracy was needed to reconcile EnergySavers Convenors' small expense items, reconciliation of the Good Guys Capalaba and BoysTown invoices for the purchase and delivery of the energy efficient appliances and the purchasing, recording and distribution of the grocery vouchers.

5 Key learnings and recommendations

LESSONS LEARNED, OBSERVATIONS AND RECOMMENDATIONS

Opportunities for improvement were identified throughout the delivery of the Green Heart Wisdom program. Where possible, issues were addressed as they arose, and processes or paperwork adjusted to improve the participant experience. The following section presents observations and lessons learned by Activity type when implementing the Pilot, Recruitment and Main Stage of Green Heart Wisdom.

5.1.1 PILOT

For one month, from November – December 2013, Green Heart Wisdom and program partners worked together to deliver a Pilot for the EnergySavers Activity and the Home Energy Check Activity. The Pilot provided an opportunity to better understand some of the delivery challenges, so improvements could be implemented prior to roll out of the program's main stage.

Lesson Learned: Undertaking a pilot is critical

Observations:

- The Runabout software was designed so that certain modifications would be recommended to participants (up to a value of 100 points/$390) based on their responses to the questions. During the pilot it was found that it was possible to bypass the points system and select items that had not been recommended by the software. The 'Runabout' software was consequently adapted to ensure only recommended items could be ordered by the Field Officer.
- Feedback from the pilot identified there were too many separate pieces of paperwork for participants to complete and for the partners to collate. To help reduce paperwork, documents were combined where possible. Approval was attained from CSIRO Ethics for all communication adjustments.
- There was some duplication of questions in the pre-program survey and the 'Runabout' software and some questions were confusing for participants eg with double negatives. Where possible questions were reformatted to make them easier to understand. Due to the research nature of this program and the requirement to collect good quality data, some questions had to be asked in different ways and in some instances double negative questioning was retained.

Recommendations:

- It is recommended that a Pilot always be carried out prior to the main roll out of any new program or service. The Pilot was an integral component of the program, allowing delivery partners to identify knowledge and data gaps and simplify the program where possible.

1.6.1 WHOLE OF PROGRAM

Lesson Learned: Volume of sign up paperwork was a deterrent for some participants.

Observations:

- When developing social science human research programs, such as GHW, it is necessary for participants to be provided with adequate detail about data privacy and management. They also needed to understand practical information about the program and sign a number of consent documents for different components of the program.
- CSIRO Social Science Human Research Ethics Committee (experts in ethical clearance) was appointed to review, provide advice and clearance for all of the program communication materials. Participants received:
    - a six page information sheet with details about the program, confidentiality details and privacy notice;
    - consent form allowing Energex access to their energy consumption data;
    - consent form for installation of energy efficient modifications (HEC participants);
    - consent form for purchase of an energy efficient appliance (HEC participants).
- Program partners and Council officers received feedback from participants that the volume of paperwork was onerous. As a result, some forms were combined. Since programs such as this require robust ethical standards to protect participants, there was still a need for participants to be fully informed.

Recommendation:

- Too much paperwork may deter people from engaging, so it is important to find a balance between ensuring the project is ethically delivered, but also connects with the audience. Where possible paperwork should be simplified, while still complying with ethical guidelines.

Lesson Learned: Recruiting participants - using random assignment was challenging.

Observations:

- In order to adhere to the principles of a research project, participants were originally allocated to one of the program groups through random assignment ie CSPs would recruit a participant and then randomly allocate them to either the Home Energy Check or the Home Energy Check Comparison group. Recruiting participants was found to be challenging and therefore, to ensure the milestones could be met, Council contracted one Community Service Provider specifically to recruit participants to the HEC Comparison group.
- Once Green Heart Wisdom was up and running, the main priority was to meet recruitment milestones and this superseded the secondary requirement, which was to maintain a random sampling methodology. The random sampling requirement was an impediment to recruitment and to ensure program timelines and milestones could be met, it was necessary to implement the alternative recruitment process.

Recommendations:

- It is important to consider possible challenges that arise from combining research principles with the practicalities of program delivery and factor to that into program planning.

Lesson Learned: Recruiting participants – existing relationships made recruiting easier.

Observations:

- **Partnership with Community Service Providers** – CSPs telephoned their own clients to recruit them to the program and this proved to be the most effective recruitment tactic. CSPs advised that seniors receive many telemarketing calls and promotional mail, which meant many people were hesitant to hear about new programs.
- **Promotion via retirement villages** – when recruiting participants to the EnergySavers Information Activity, retirement villages were approached. Many villages were not willing to permit the distribution of flyers, since they advised that it was their role to protect residents from receiving large amounts of promotional materials. These barriers to engagement should be considered when recruiting for future programs.
- **Trusted ambassadors** - a newspaper article in a local community newspaper, featured an endorsement by the local Councillor and this increased telephone enquiries about the program.
- **Recommendation by friends** - word of mouth between participants was also a successful recruitment method. Once the program had been running for a few months it was noticed that more recommendations were received from people whose friends had participated and encouraged them to become engaged. Although word of mouth is effective, it takes time to become established.
- **Digital media** – recruitment as a result of digital advertising was limited. While many seniors are engaged with social media and internet channels the program showed that these channels cannot be relied on for communication.
- **TV advertising** - if a similar program was run in the future and there was sufficient marketing budget available, it is recommended that television advertising be adopted to reach a wider audience. Conducting an analysis of television viewing with this demographic may help to build the framework for a television campaign.

Recommendation:

- It is recommended that trusted channels are identified to help engage prospective participants, such as partnering with agencies familiar with the target audience (in this case Community Service Providers), endorsement of the program by a local Councillor, or word of mouth, from a trusted friend or family member.

Lesson Learned: Participants' data was de-identified, which added complexity when managing the data collection process

Observations:

- In accordance with the Privacy Act, each prospective participant was allocated a unique identification number and all other personal details removed from their records. This ID number had to be included on the documents at all stages of the program including: i) opt out requests

ii) pre-program surveys iii) Home Energy Check 'Runabout' responses iv) post-program surveys v) modification/appliance consent forms.

- Although the process allowed the successful collection of participant data, it required significant monitoring to ensure that all necessary paperwork and consents were provided to constitute a complete participant and that milestones were being met.

Recommendation:

- It was financially prohibitive to develop a stand-alone system and database to collect and store all of the participant program data but a single system for recruitment and data collection is recommended. The ideal system would interface with an ordering software product (such as ASAP). The system would need to have the following capabilities:
    - receive CSP upload of participant data and addition of new participants
    - store the participant's personal details
    - allow the recruiter to screen the participant for eligibility, using the recruitment script
    - enable the recruiter to make appointments for Home Energy Check or EnergySavers sessions and automatically generate a letter of appointment confirmation
    - collate responses collected by the Field Officer in the home, via the tablet ie pre-survey, Home Energy Check and post survey
    - save all consent forms relating to the participant's record
    - extract reports to ensure any data gaps could be identified throughout the process, facilitating timely follow up of missing information.

Lesson Learned: The program would have benefitted from a Participant ID validation code being built into the process tools.

Observations:

- The participant ID was included on participant data throughout the data collection process. Pre and post surveys were carried out using tablets or PCs, so they relied upon the interviewer inputting the participant ID correctly. In some instances IDs were duplicated or inaccurately recorded and had to be manually corrected.

Recommendation:

- It is recommended that a participant ID validation code be built into the delivery process. This may help prevent number duplication or incorrect formats and therefore reduce the time required to resolve data inconsistencies.

Lesson Learned : Sufficient time is required to explain the program to potential participants.

Observations:

- CSPs reported that participants naturally had many questions and concerns that needed to be addressed before they would sign up to Green Heart Wisdom. In addition, there was a considerable amount of information to be collected by Field Officers from each person during visits. Key observations are as follows:

- The majority of recruitment was carried out by telephone. Seniors receive a large number of telemarketing calls and are therefore wary of offers that seem 'too good to be true'.
- Some people in this age group were hard of hearing. It was anticipated that recruitment telephone calls could be carried out reasonably quickly, but time was required to connect with the audience so that they were comfortable with the opportunity that was being presented.
- Throughout the program, 30 minutes were allocated for completion of the pre-survey and 15 minutes for completion of the post-survey. Where participants had a Home Energy Check there was an additional 15 minute risk assessment and one hour to complete the home assessment. CSP contracts were drafted and resources were allocated based upon these estimates.
- Participants who received a Home Energy Check met with the field officer face to face. Field Officers reported that they needed to explain questions and sometimes repeat them which meant that Home Energy Checks sometimes exceeded the delivery time that had been allocated. To address this, the survey questions and 'Runabout' questions were cut down to reduce the time required to complete a Home Energy Check.

Recommendation:

- When developing similar programs, it is recommended that time trials be carried out with the relevant audience, to determine how long home visits should take.
- Additional time to explain questions, listen to, and connect with the audience needs to be considered.

Lesson Learned: No up-take of the No Interest Loan Scheme (NILS)

Observations:

- Out of all the participants who received a low cost appliance, none chose to access the NILS loan. Feedback from the CSPs indicated that since the cost of the appliances was low ($125), all participants chose to cover the cost themselves.

Recommendation:

- Although there was no uptake of the NILS loan by Green Heart Wisdom participants, the option for them to be made aware of the scheme is recommended in future programs. If the cost to the participant of appliances was higher in future programs, the availability of the loan could be of benefit. It is recommended that the availability of a no interest loan is continued in future programs.

Lesson Learned: Low take up of off peak tariff connections.

Observations:

- Fewer participants than anticipated took up the offer to connect to an off peak tariff. Anecdotal feedback from CSPs suggested that explaining the process of off peak tariffs was perceived as complicated and the process of implementing the connection was seen as too difficult.

Recommendations:

- Recruiting qualified electricians may be a solution, as an assessment for the off peak tariff could be carried out at the time of the Home Energy Check. With their knowledge, the electrician could co-ordinate the necessary details with the energy provider and complete the installation. This process would reduce complexity for both the participant and the program partner.

1.6.2 ENERGYSAVERS ONLY

Lesson Learned: **Commitment required by participants to attend the EnergySavers groups made recruitment harder.**

Observations:

- The EnergySavers activity required groups of at least eight eligible participants to meet once a month over a four month period. When signing up to the program, each participant was required to commit to attending four sessions. Venues that were within reasonable travelling distance for the group members also had to be located and booked.
- During the recruitment process, some prospective participants advised they had competing commitments such as being busy with family, social arrangements or medical appointments, or were not able to easily travel to an EnergySavers location.

Recommendation:

- To increase participation consider holding group workshops, as Council did at City Hall.
- Consider larger incentives to encourage greater participation.
- If an EnergySavers model is delivered, consider a reduced number of sessions to encourage more participants to get involved.

Lessons Learned: **Paper-based distribution and collection of EnergySavers participant consent forms and surveys added complexity**

Observations:

- EnergySaver participants were sent participant information sheets to complete and bring to their first session. Convenors collected the paperwork, sighted each pensioner concession card to re-confirm eligibility and distributed the pre-surveys. At registration, each participant was allocated their ID number and all of the correct paperwork had to be tagged with this ID number. This process meant that some data inconsistencies slipped through, and this required additional resources and time to resolve.

Recommendation:

- Consider opportunities to automate the registration process. Participants could complete their registration, including consent forms and surveys on line, at the first workshop. This would ensure that ID numbers and documentation would be automatically stored within the database.

Lesson Learned: **Recruiting groups of eight eligible participants was resource intensive**

Observations:

- Council officers contacted community social groups throughout Brisbane requesting an opportunity to present about the Green Heart Wisdom program. This method relied upon Council developing a good relationship with each group's management, in order to schedule presentations. This approach resulted in several groups registering, but the minimum number of participants was not always reached and anecdotal feedback indicates that there were several contributing factors to this:
    - Firstly, the complexity of the program was not easy to communicate to senior residents in a large group setting. Some seniors may suffer from hearing and/or visual impairment which resulted in residents not clearly understanding the program.
    - Secondly, many seniors already have busy social schedules and advised they did not have the time to dedicate to the program.
    - Thirdly, these group information sessions were delivered to a general audience and, as such, not all seniors present were eligible to participate in the program.

Recommendation:

- Explore opportunities to host larger group sessions and adjust workshop model.

1.6.3 HOME ENERGY CHECK ONLY

Lesson Learned: Recruiting participants to the Home Energy Check Only activity was labour intensive

Observations:

- CSPs were responsible for phoning their client base to recruit participants to the program and this proved more labor-intensive than anticipated. A large volume of calls had to be made by CSPs to meet their recruitment milestones. CSP feedback indicates a number of reasons that participants were reluctant to sign up, including:
    i) they believed they 'wouldn't live long enough to benefit' from the appliance or in-home modifications;
    ii) they felt distrustful of the offer;
    iii) they were not interested;
    iv) they had already participated in other energy efficiency programs;
    v) they believed their behaviour was already energy efficient and suggested that younger audiences should be targeted.
- In addition to addressing the above barriers, the recruiting officer was required to read from the CSIRO Ethics approved script, which added to the time it took to recruit. As recruitment was by telephone, prospective participants sometimes experienced hearing difficulties and had challenges understanding some of the more complex subject matter and privacy information. This required investment of additional time to discuss the program, which was not originally anticipated.

Recommendations:

- In spite of the above barriers to recruitment, partnering with the CSPs was the most effective recruitment strategy.

- Since low income seniors may be wary of signing up to new programs, communication must be tailored to the needs of this audience. Factor in adequate time at the planning stage, to ensure sufficient resources are allocated to engage participants.

Lesson Learned: The process for ordering appliances could be simplified

Observations:

- Orders for the appliances from The Good Guys Capalaba were placed individually by the Field Officers for each participant and this resulted in a heavier than anticipated workload for The Good Guys staff, who had to process each order individually. The Good Guys also had to handle a large volume of phone calls from participants who rang requesting information about their appliance. The Good Guys' IT system was not always compatible with the reporting required by the Green Heart Wisdom program and consequently providing the necessary data was at times onerous for them.

Recommendations:

- If appliances were ordered in future programs it is recommended that appliances are ordered in batches, on a monthly basis, rather than individually. In this way a large number of appliances could be ordered at one time, simplifying the ordering process, as well as reporting.

1.6.4 ENERGYSAVERS INFORMATION

Lesson Learned: Challenges recruiting to the EnergySavers activity was challenging.

Observations:

- Recruiting participants to the EnergySavers Only Activity was challenging (see above) and once all tactics had been exhausted, Brisbane City Council approached CSIRO and the Department of Industry, Innovation and Science to suggest a delivery variation whereby participants would receive copies of the EnergySavers magazines posted to their homes, rather than attend group workshops. A pre and post program survey still needed to be completed and a grocery voucher was provided upon completion of the activity to show appreciation for the participant's commitment.

Despite simplifying the process it still proved hard to engage the audience. The following efforts were undertaken to increase the recruitment rate for this activity:

- Direct contact was made with managers of 18 retirement villages (with a total of more than 4,000 units). Two advised that they preferred not to participate, due to the perception that their residents "weren't financially motivated" and the perception that there would be limited interest as the surveys were "too complicated".
- 800 flyers were sent to 16 retirement villages, three of which assured that they would be distributed to all of the residents. The other 13 advised they would leave them in communal areas. These villages strictly protect their residents from bulk/junk mail outs. The program received a total of three responses from this method of engagement, therefore it was difficult to know if flyers were actually distributed to residents or left in communal areas.
- Eleven of these retirement villages were also being targeted by other CSPs to provide Home Energy Checks or higher value interventions. It was therefore, important to time the EnergySavers

Information activity to commence after the recruitment to the other Activities were complete, so as not to confuse or create angst amongst residents.

- 75 people who had indicated their interested in EnergySavers workshops, but could not attend were called and invited to participate.

Recommendations:

- It is recommended that in future programs more time is allowed to market the program and recruit participants to this activity.

1.6.5 ENERGYSAVERS COMPARISON GROUP

Lesson Learned: **Recruiting to the EnergySavers Comparison group activity was very labour intensive.**

Observations:

- Once recruitment to the other three priority activities had been completed, a range of tactics was adopted to recruit participants to the EnergySavers Comparison group. Officers attended Council's Active and Healthy sessions for the 50 plus age group, throughout Brisbane, such as Tai-Chi, Zumba, Aqua aerobics, Yoga, Fitness for seniors, and gentle exercise classes. This method of recruitment was very time consuming. It was not possible to pre-determine how many participants would attend and whether those in attendance would be eligible. In addition, explaining the program to prospective participants when they were preparing for an activity was challenging. However this process was a relatively successful tactic for engaging with the audience.

  The most successful tactic was hosting a stand at the Taigum Ageing Expo in October 2014. The majority of participants were recruited for the Activity at this event, with a large number of people signing up once the program and the grocery voucher incentive was explained to them.

Recommendation:

- Identifying events attended by this audience is an effective recruitment tactic. The Brisbane City Council brand was helpful in giving integrity to the program and encouraging the audience to register. The grocery voucher incentive also seemed to attract participation.

Summary of key lessons and recommendations

Ensure that collaborative partnerships between program facilitators, the target community, and service providers with ties to the target community, are fostered for optimal recruitment to energy efficiency programs.

One of the key successes of the GHW program was the establishment of trusting, collaborative partnerships between the Brisbane City Council, groups and agencies with existing ties with the target population, with Community Service Providers, and with research organisations. This ensured a high level of recruitment to the program, often a challenging task for social programs.

For optimal recruitment, home-based interventions may be preferable when targeting senior low-income participants.

Compared to the Home Energy Check, the need to travel to a public place on set dates and time for participation in the CSIRO EnergySavers sessions appears to have been a significant barrier for recruiting and retaining senior, low-income participants to the GHW program.

For optimal evaluation, it is important to ensure program incentives are equivalent between treatments to facilitate random assignment of participants.

It is important that recruitment occurs concurrently for all program treatments and that participants are randomly assigned to treatments. Program incentives should be equivalent between intervention and control group treatments to facilitate random assignment of participants. Random assignment will allow the program evaluation to identify any causal effects resulted by the program.

Future programs seeking to provide energy efficiency modifications for low-income seniors should concentrate on appliances that have a large impact on energy consumption.

Energy efficiency modifications were most effective in reducing household energy costs for participants who received a refrigerator upgrade. This finding suggests that when offering appliance upgrades, the potential energy reduction resulting from different appliances plays a key role in reducing household energy consumption and energy efficient modifications should focus on appliances that may have a large impact on energy consumption.

Effective interventions for senior low-income householders should focus on the need for seniors to balance energy efficiency and reduced energy costs with the need for thermal comfort in the home.

Home thermal comfort plays a key role in maintaining participants' wellbeing, with 70% of participants relying on heating and cooling appliances for thermal comfort. Data from the program indicates that thermal comfort is a key area for improving the energy efficiency and comfort of low-income seniors. Due to the large impact of heating and cooling appliances on households' electricity bills as well as on electricity peak demand, future research needs to better understand how the use of heating and cooling systems could be improved while maintaining households' wellbeing. Exploring the energy efficiency of housing as well as households' social practices in regard to heating and cooling is important to develop policies that can facilitate the energy efficient use of heating and cooling systems.

Participants' recommendations for future programs

Changes to possible future versions of the GHW program were offered by a number of post-program interview participants (n=42).

From HEC participants, suggestions included:

- Introducing in-home displays for more homes to enable ease of energy monitoring and instant feedback
- Guidance provided for the newly installed appliances, including on how to use their new appliances in an energy efficient manner
- Measuring energy use of specific appliances, and having the HEC conducted by an electrician
- Ensuring appropriate match between household needs and appliance size, type and ease of use
- Greater attention with installation of appliances or other features
- HEC to include a fire safety check.

6 Conclusion

Broadly, the GHW Program was successful in meeting its program objectives, although impacts varied between activities. The activities that included a Home Energy Check (and especially the associated replacement of appliances) showed the strongest overall benefits in the program.

Changes in energy consumption assessed across the program are relatively small. Since people with low incomes targeted in this program are paying up to 7% of their disposable income on household energy costs (per ABS data from 2009-10), even small reductions could be expected to have benefits for them.

Further, program participants already were careful with energy consumption at the program outset, and thus have limited scope to further reduce consumption by further changing their behaviour (since they are already taking many of the discretionary steps available to them). In line with this suggestion, EnergySavers activities without Home Energy Checks did not show significant reductions in energy consumption over the trial period – we conclude that any new behaviour changes evoked by the EnergySavers process were too small to show a meaningful change across the participants.

However, appliance changes delivered within the HEC activities did tend to produce significant reductions in energy consumption (and related reductions in costs and emissions). Obviously, such reductions stem from replacing old inefficient appliances (especially refrigerators) with new higher-efficiency versions.

Successful outcomes:

- A high level of participant recruitment to the program;
- Creation of an extensive corpus of data on the energy consumption behaviours and attitudes of low-income senior citizens in the Brisbane area (such detailed data did not exist prior to this program);
- Participants who received a HEC and/or participated in a face-to-face ES activity self-reported an increased awareness and level of understanding of energy efficiency by the end of the program;
- Participants who received a HEC and/or participated in a face-to-face ES activity self-reported an increased frequency of energy efficient behaviour at the end of the program;
- Participants who received a refrigerator upgrade and/or installed CFL lighting had a significant reduction in energy consumption (pre-program and post-program six-month comparison);
- Qualitative feedback received from participants suggests that:
  - People who improved their energy efficient use of heating and cooling appliances benefited from greater control over their energy consumption while maintaining their thermal comfort;
  - Some participants reported that ceiling fans and power boards contributed to improving their levels of comfort within the home.

Program limitations:

- Because of non-random assignment of participants to different activity groups, the program evaluation could not confirm causal effects, and could not statistically compare the impact of interventions relative to equivalent non-intervention group. As a result, many conclusions can be drawn only tentatively, and should ideally be replicated with a formal control group and random assignment.

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Appendices

A.1 Recruitment and program activities tables

Table 17 Green Heart Wisdom Program recruitment outcomes

TREATMENT	PARTICIPANT		NOT COMPLIANT		NOT ELIGIBLE		NOT STATED		NOT WILLING TO PARTICIPATE		TOTAL
	N	%	N	%	N	%	N	%	N	%	N
HEC Only	605	62	2	0	4	0	0	0	367	38	978
HEC & ES Information	300	100	0	0	0	0	0	0	0	0	300
ES Comparison	243	31	17	2	46	6	16	2	458	59	780
HEC Comparison	206	51	55	14	6	1	0	0	134	33	401
ES Only	159	66	25	10	0	0	0	0	58	24	242
HEC pilot	54	95	3	5	0	0	0	0	0	0	57
HEC & ES	41	14	9	3	6	2	0	0	238	81	294
ES Postal	33	79	4	10	0	0	0	0	5	12	42
ES pilot	6	60	1	10	0	0	0	0	3	30	10
Total	1647	53	116	4	62	2	16	1	1263	41	3104

Based on screener information provided by Council.
N= Number of individuals approached within each treatment.

Table 18 How participants heard about the program

	HEC ONLY		ES ONLY		HEC & ES		HEC COMPARISON		ES COMPARISON		ES INFORMATION		HEC& ES INFORMATION		TOTAL	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Community Service Provider	430	71.7	7	4.4	11	18.3	201	97.6	872	4.9	1	3.0	210	73.4	872	52.9
Friend	124	20.7	8	5.0	9	15.0	0	0	200	7.0	1	3.0	40	14.0	200	12.1
Brisbane City Council	1	0.2	52	32.7	10	16.7	0	0	195	43.6	23	69.7	2	0.7	195	11.8
Community group	20	3.3	39	24.5	4	6.7	1	0.4	95	10.3	2	6.1	1	0.3	95	5.8
Community centre	4	0.7	20	12.6	14	23.3	0	0	73	9.5	1	3.0	10	3.5	73	4.4
Family member	14	2.3	4	2.5	2	3.3	0	0	43	5.3	2	6.1	8	2.8	43	2.6
Convenor	0	0.0	5	3.1	0	0.0	2	1.0	11	1.6	0	0.0	0	0.0	11	0.7
Work	0	0.0	0	0.0	0	0.0	0	0	3	1.2	0	0.0	0	0.0	3	0.2
CSIRO	0	0.0	0	0.0	0	0.0	0	0	0	0.0	0	0.0	0	0.0	0	0.0
Other	4	0.7	23	14.5	9	15.0	2	1.0	79	15.6	2	6.1	1	0.3	79	4.8
Not stated	3	0.5	1	0.6	1	1.7	0	0	76	0.8	1	3.0	14	4.9	76	4.6
Total	600	100	159	100	60	100	206	100	243	100	33	100	286	100	1647	100

Note: This data was not collected for pilot program participants

Table 19 Main motivation for participation in the Green Heart Wisdom Program

	HEC ONLY		ES ONLY		HEC & ES		HEC COMPARISON		ES COMPARISON		ES INFORMATION		HEC& ES INFORMATION		HEC (PILOT)		ES (PILOT)		TOTAL	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
To reduce my electricity and/or gas bill	351	58.5	75	47.2	29	48.3	0	0	51	21	14	42.4	162	56.6	12	22.2	3	50	697	42.3
To improve the energy efficiency of my home	79	13.2	43	27.0	13	21.7	0	0	35	14.4	7	21.2	42	14.7	10	18.5	1	16.7	230	14.0
To receive the program incentive	116	19.3	1	0.6	5	8.3	0	0	20	8.2	0	0	29	10.1	0	0	0	0	171	10.4
To contribute to CSIRO research	27	4.5	12	7.5	3	5	0	0	66	27.2	3	9.1	15	5.2	4	7.4	0	0	130	7.9
Other	13	2.2	20	12.6	9	15	0	0	14	5.8	5	15.2	18	6.3	2	3.7	0	0	81	4.9
To help the environment	12	2	7	4.4	1	1.7	0	0	22	9.1	3	9.1	17	5.9	2	3.7	2	33.3	66	4.0
Not stated	2	0.3	1	0.6	0	0	206	100	35	14.4	1	3	3	1	24	44.4	0	0	272	16.5
Total	600	100	159	100	60	100	206	100	243	100	33	100	286	100	54	100	6	100	1647	100

Table 20 Program duration

TREATMENT	N	MEAN	SD	MIN	MAX
HEC Only	559	110	36	35	270
ES Only	126	88	18	14	134
HEC & ES	57	99	32	27	153
HEC Comparison	196	68	10	38	105
ES Comparison	198	93	45	22	325
ES Postal	30	51	18	26	114
HEC & ES Information	256	56	30	21	126
Total	1422				

N= number of participants
Mean= Average program duration for treatment (number of days)
SD= standard deviation
Min= shortest program duration within treatment (number of days)
Max= longest program duration within treatment (number of days)

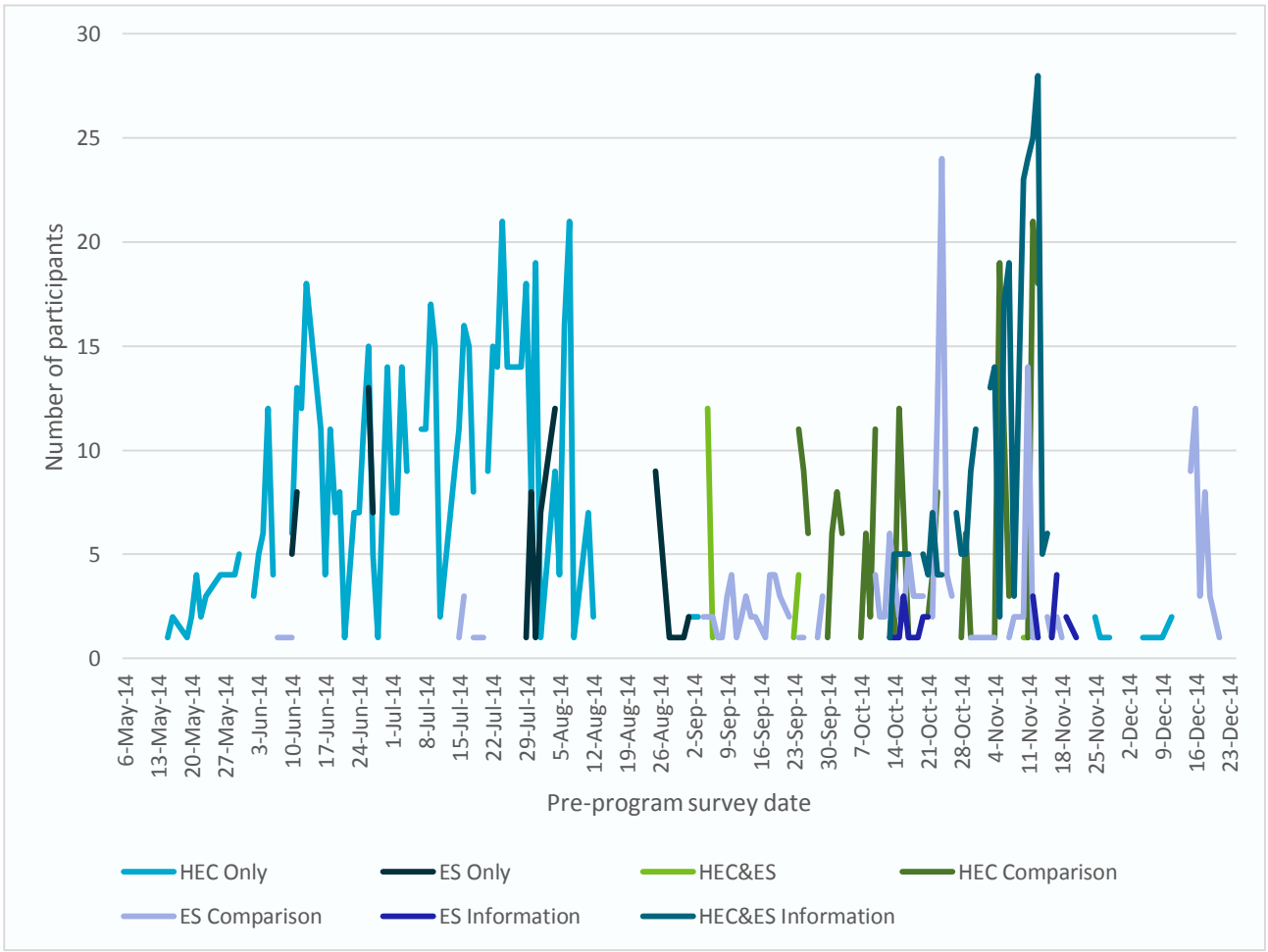

Figure 22 Program activity start date

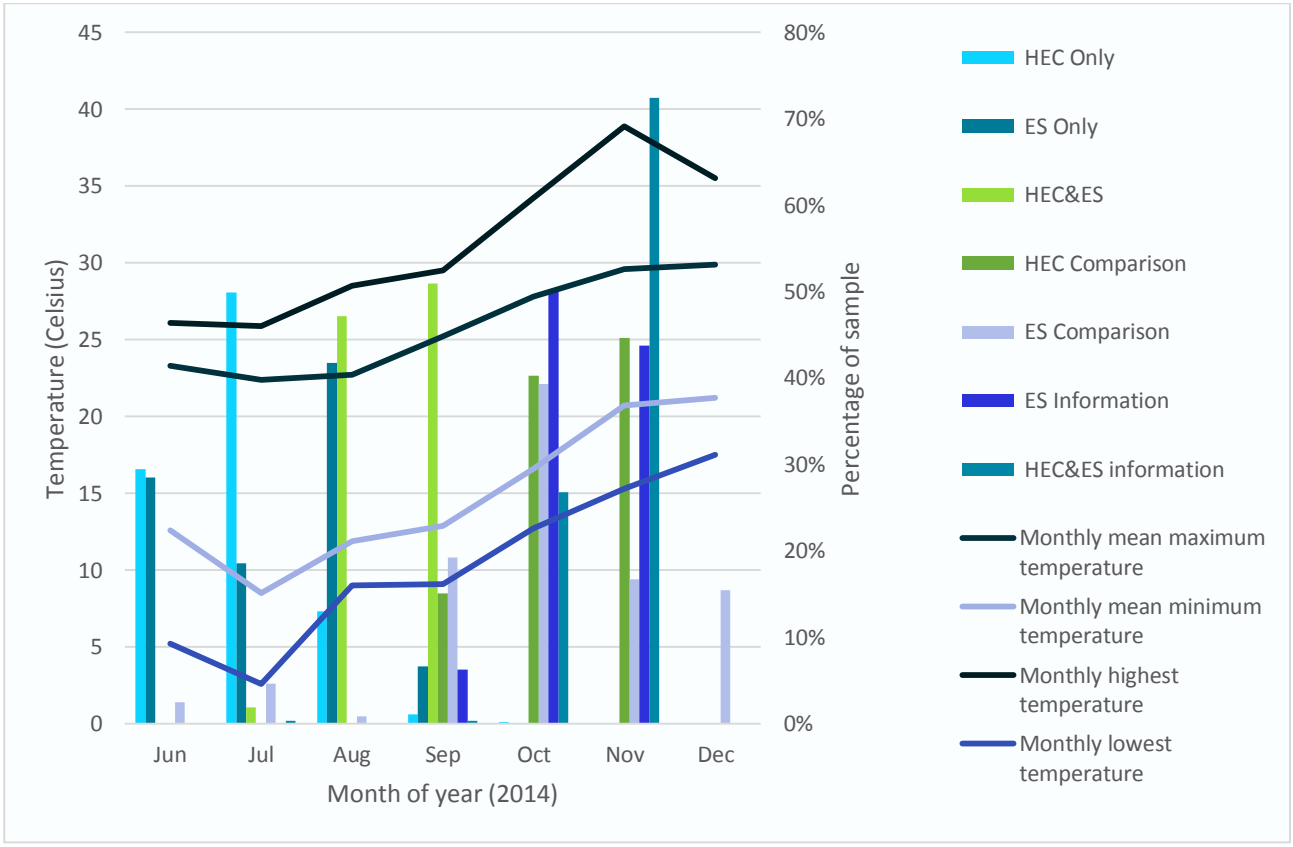

Figure 23 Timing of pre-program survey completion and Brisbane temperature

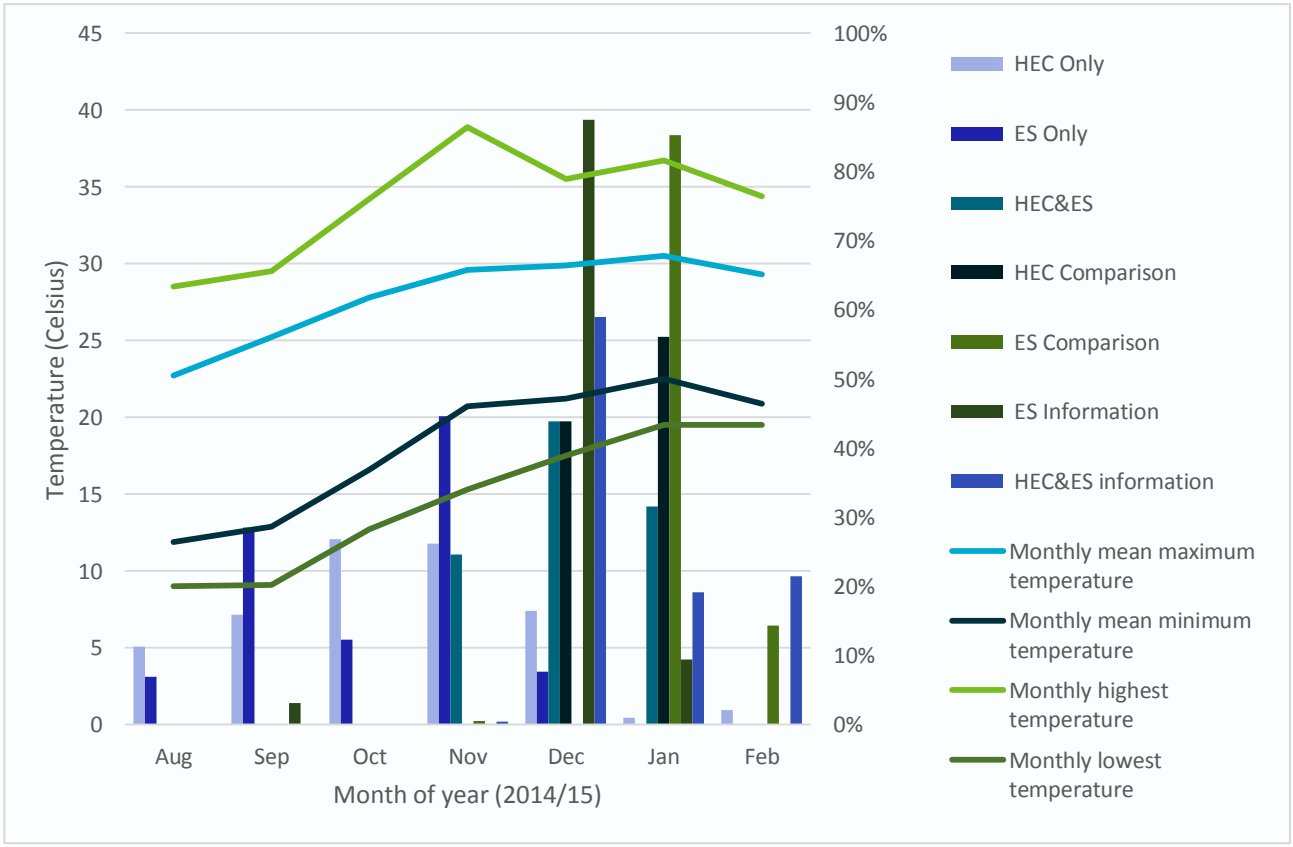

Figure 24 Timing of post-program survey completion and Brisbane temperature

Table 21 Summary of GHW program data collection

PROGRAM DATA COLLECTED	AGENCY RESPONSIBLE FOR DATA COLLECTION	SOURCE	FORMAT RECEIVED	NUMBER OF FILES CSIRO RECEIVED WITH FINAL DATA
Eligibility screener	Q&A Market Research	Online forms	SPSS file	Three files
Pre-program survey data	Q&A Market Research	Online survey Paper surveys	SPSS file	Three files: Pilot pre-program survey and Home Energy Check data Pilot post-program survey data Main stage data
Home Energy Check data	Q&A Market Research	PGA tool, Runabout	SPSS file	
Post-program survey data	Q&A Market Research	Online survey Paper surveys	SPSS file	
Home modifications received by participants as a result of home energy check	Community Service Providers (through PGA tool, Runabout)	PGA tool, Runabout	Excel spreadsheets	Seven files: Pilot data Data collected by each CSP
Electricity consumption data	Energex	Meter data	Excel spreadsheets	Daily e-mail feeds (over 300 Excel files)
Gas consumption data	APA Group	Meter data	Excel spreadsheets	One Excel file

Table 22 Completion rate of GHW program data

	PRE-PROGRAM SURVEY ONLY		PRE-PROGRAM SURVEY AND HEC TOOL		PRE-PROGRAM AND POST-PROGRAM SURVEYS		PRE-PROGRAM AND POST-PROGRAM SURVEYS AND HEC TOOL		COMPLETE DATA (INCLUDES ELECTRICITY METER DATA)	
	N	%	N	%	N	%	N	%	N	%
HEC Only (n=600)	598	99.7	596	99.3	564	94.0	562	93.7	556	94.1
ES Only (N=159)	157	98.7			129	81.1			121	82.9
HEC & ES (N=60)	60	100.0	60	100.0	57	95.0	95	95.0	47	95.9
HEC Comparison (N=206)	206	100.0			196	95.2			190	95.0
ES Comparison (N=243)	239	98.4			231	95.1			221	94.9
ES Postal (N=33)	32	97.0			31	93.9	31	93.9	30	93.8
HEC & ES Information (N=286)	283	99.0	282	98.6	258	90.2	258	90.2	245	90.7
HEC Pilot (N=54)	31	57.4	31	57.4	22	40.7	22	40.7	20	41.7
ES Pilot (N=6)	6	100.0			4	66.7			4	80.0
Total (N=1647)	1612	97.9	969	96.9	1492	89.1	937	93.7	1434	85.7

Table 23 CSIRO EnergySavers attendance

CSIRO ENERGYSAVERS SESSION	ES ONLY		HEC & ES		ES PILOT		TOTAL	
	N	%	N	%	N	%	N	%
Session 1	142	89	59	98	5	83	206	92
Session 2	134	84	31	52	4	67	169	75
Session 3	125	79	22	37	6	100	153	68
Session 4	130	82	30	50	4	67	164	73
Overall number of participants in treatment	159		60		6		225	

Table 24 EnergySavers sessions delivered within HEC & ES treatment

TREATMENT	GROUP ID	SESSION 1 DATE	NUMBER OF ATTENDEES	SESSION 2 DATE	NUMBER OF ATTENDEES	SESSION 3 DATE	NUMBER OF ATTENDEES	SESSION 4 DATE	NUMBER OF ATTENDEES
HEC & ES	23501	18 Aug 14	4	15 Sep 14	3	20 Oct 14	4	17 Nov 14	4
HEC & ES	23502	14 Aug 14	9	11 Sep 14	3	9 Oct 14	0	6 Nov 14	1
HEC & ES	23503	14 Aug 14	12	11 Sep 14	5	9 Oct 14	5	6 Nov14	7
HEC & ES	23504	5 Sep 14	6	26 Sep 14	6	7 Nov 14	0	7 Nov 14	5
HEC & ES	23505	5 Sep 14	7	26 Sep14	4	17 Oct 14	5	7 Nov 14	4
HEC & ES	23506	5 Sep 14	2	cancelled	0	cancelled	0	cancelled	0
HEC & ES	23507	17 Sep 14	6	8 Oct 14	6	29 Oct 14	5	19 Nov14	3
HEC & ES	23508	24 Sep 14	5	15 Oct 14	3	5 Nov 14	2	19 Nov14	4
HEC & ES	23509	26 Sep 14	5	7 Nov 14	0	7 Nov 14	0	28 Nov14	0
HEC & ES	Other		3		1		1		2
Total			59		31		22		30

Other= Three participants have attended an ES Only group however they also received a Home Energy Check. These participants have been reallocated to the HEC & ES treatment.
Note: The information about the EnergySavers groups that have been established is from group coordination records and the convenor evaluation forms that are completed by convenors after each EnergySavers session.

Table 25 EnergySavers sessions delivered within ES only treatment

TREATMENT	GROUP ID	SESSION 1 DATE	NUMBER OF ATTENDEES	SESSION 2 DATE	NUMBER OF ATTENDEES	SESSION 3 DATE	NUMBER OF ATTENDEES	SESSION 4 DATE	NUMBER OF ATTENDEES
ES Only pilot	23001	6 Nov 13	3	4 Dec 13	2	5 Feb 14	4	5 Mar 14	2
ES Only pilot	23005	2 Dec 13	2	6 Jan 14	2	3 Feb 14	2	3 Mar 14	2
ES Only	23101	19 May 14	7	10 Jun 14	7	21 Jul 14	5	18 Aug 14	7
ES Only	23102	10 Jun 14	5	8 Jul 14	3	12 Aug 14	4	9 Sep 14	5
ES Only	23103	6 Jun 14	6	11 Jul 14	4	8 Aug 14	6	12 Sep 14	6
ES Only	23104	11 Jun 14	8	9 Jul 14	8	6 Aug 14	6	10 Sep 14	7
ES Only	23105	13 Jun 14	4	18 Jul 14	4	11 Aug 14	2	8 Sep 14	4
ES Only	23106	26 Jun 14	14	25 Jul 14	9	21 Aug 14	12	25 Sep 14	9
ES Only	23107	27 Jun 14	8	25 Jul 14	10	28 Aug 14	10	25 Sep 14	10
ES Only	23108	25 Jul 14	7	22 Aug 14	6	26 Sep 14	6	31 Oct 14	4
ES Only	23109	31 Jul 14	12	25 Aug 14	13	15 Sep 14	14	27 Oct 14	10
ES Only	23110	1 Aug 14	6	5 Sep 14	7	3 Oct 14	3	7 Nov 14	4
ES Only	23111	4 Aug 14	8	1 Sep 14	9	13 Oct 14	7	10 Nov 14	8
ES Only	23112	30 Jul 14	8	12 Aug 14	4	22 Sep 14	6	24 Oct 14	7
ES Only	23113	4 Aug 14	4	25 Aug 14	4	22 Sep 14	3	27 Oct 14	3
ES Only	23114	14 Aug 14	6	11 Sep 14	8	9 Oct 14	9	6 Nov 14	10
ES Only	23115	14 Aug 14	7	11 Sep 14	7	9 Oct 14	8	6 Nov 14	7
ES Only	23116	14 Aug 14	8	11 Sep 14	8	9 Oct 14	5	6 Nov 14	7
ES Only	23117	14 Aug 14	6	11 Sep 14	7	9 Oct 14	7	6 Nov 14	7
ES Only	23118	25 Aug 14	8	22 Sep 14	7	20 Oct 14	3	17 Nov 14	7
ES Only	23119	28 Aug 14	8	25 Sep 14	8	30 Oct 14	8	27 Nov 14	7
ES Only	23120	28 Aug 14	2	26 Sep 14	1	9 Oct 14	1	13 Nov 14	1
Total			147		138		131		134

Note: The information about the EnergySavers groups that have been established is from group coordination records and the convenor evaluation forms that are completed by convenors after each EnergySavers session.

A.2 Participants' demographic tables

Table 26 Participants' gender by treatment

	HEC ONLY		ES ONLY		HEC & ES		HEC COMPARISON		ES COMPARISON		ES INFORMATION		HEC& ES INFORMATION		HEC (PILOT)		ES (PILOT)		TOTAL		2011 CENSUS DATA
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	%
Female	467	77.8	104	65.4	39	65	167	81.1	170	70	19	57.6	222	77.6	21	38.9	2	33.3	1211	73.5	54.7
Male	131	21.8	54	34	21	35	39	18.9	71	29.2	13	39.4	63	22	10	18.5	4	66.7	406	24.7	45.3
Response not stated	2	0.3	1	0.6	0	0	0	0	2	0.8	1	3	1	0.3	23	42.6	0	0	30	1.8	-
Total	**600**	**100**	**159**	**100**	**60**	**100**	**206**	**100**	**243**	**100**	**33**	**100**	**286**	**100**	**54**	**100**	**6**	**100**	**1647**	**100**	**100**

Census Data Source: 2011 Census of Population and Housing. Table generated using ABS TableBuilder.
Note: 2011 Census data is for population aged 60 and above living in Brisbane City Council Local Government Area.

Table 27 Participants' age by treatment

	HEC ONLY		ES ONLY		HEC & ES		HEC COMPARISON		ES COMPARISON		ES INFORMATION		HEC& ES INFORMATION		HEC (PILOT)		ES (PILOT)		TOTAL		2011 CENSUS DATA
	N	%	N	%	N	%	N	%	N	%	N	N	N	%	N	%	N	%	N	%	%
Under 60 years	0	0	3	1.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0.2	n/a
60 to 64	7	1.2	15	9.4	1	1.7	7	3.4	13	5.3	1	3	9	3.1	0	0	0	0	53	3.2	29.2
65 to 69	84	14	40	25.2	13	21.7	19	9.2	81	33.3	9	27.3	34	11.9	3	5.6	1	16.7	284	17.2	21.0
70 to 74	119	19.8	33	20.8	13	21.7	34	16.5	72	29.6	8	24.2	49	17.1	6	11.1	0	0	334	20.3	15.7
75 to 79	134	22.3	31	19.5	15	25	49	23.8	43	17.7	6	18.2	61	21.3	6	11.1	3	50	348	21.1	12.4
80 to 84	142	23.7	20	12.6	11	18.3	48	23.3	22	9.1	4	12.1	73	25.5	8	14.8	2	33.3	330	20	10.7
85 to 89	85	14.2	13	8.2	6	10	35	17	9	3.7	4	12.1	47	16.4	5	9.3	0	0	204	12.4	7.3
90 to 94	25	4.2	0	0	0	0	11	5.3	1	0.4	0	0	10	3.5	2	3.7	0	0	49	3	2.9
95 to 99	2	0.3	0	0	0	0	3	1.5	0	0	0	0	0	0	1	1.9	0	0	6	0.4	0.7
Response not stated	2	0.3	4	2.5	1	1.7	0	0	2	0.8	1	3	3	1	23	42.6	0	0	36	2.2	n/a
Total	600	100	159	100	60	100	206	100	243	100	33	100	286	100	54	100	6	100	1647	100	100.0

Census Data Source: 2011 Census of Population and Housing. Table generated using ABS TableBuilder.
Note: 2011 Census data is for population aged 60 and above living in Brisbane City Council Local Government Area.

Table 28 Participants' age and gender

	GHW PARTICIPANTS								2011 CENSUS DATA	
	FEMALE		MALE		NOT STATED		TOTAL		MALE	FEMALE
	N	%	N	%	N	%	N	%	%	%
Under 60	2	0	1	0	0	0	3	0	n/a	n/a
60-64 years	34	2	19	1	0	0	53	3	14.4	14.8
65-69 years	210	13	73	4	1	0	284	17	10.2	10.8
70-74 years	253	15	81	5	0	0	334	20	7.4	8.3
75-79 years	262	16	86	5	0	0	348	21	5.5	7.0
80-84 years	248	15	82	5	0	0	330	20	4.4	6.4
85-89 years	154	9	50	3	0	0	204	12	2.5	4.8
90-94 years	41	2	8	0	0	0	49	3	0.8	2.1
95-99 years	3	0	3	0	0	0	6	0	0.2	0.5
100 years and over	0	0	0	0	0	0	0	0	0.0	0.1
Response not stated	4	0	3	0	29	2	36	2		
Total	1,211	74	406	25	30	2	1,647		45.3	54.7

Census Data Source: 2011 Census of Population and Housing. Note: 2011 Census data is for population aged 60 and above living in Brisbane City Council Local Government Area. Table generated using ABS TableBuilder, © Commonwealth of Australia

Table 29 Ownership of Participants' home by treatment

	HEC ONLY		ES ONLY		HEC & ES		HEC COMPARISON		ES COMPARISON		ES INFORMATION		HEC& ES INFORMATION		HEC (PILOT)		ES (PILOT)		TOTAL		2011 CENSUS DATA
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	%
Own house (owned with mortgage repayments)	184	30.7	14	8.8	6	10	11	5.3	20	8.2	3	9.1	8	2.8	16	29.6	0	0	262	15.9	15.0
Own house (owned outright)	413	68.8	128	80.5	53	88.3	195	94.7	212	87.2	27	81.8	273	95.5	38	70.4	6	100	1345	81.7	67.3
Other	1	0.2	9	5.7	1	1.7	0	0	10	4.1	2	6.1	3	1	0	0	0	0	26	1.6	17.7
Response not stated	2	0.3	8	5	0	0	0	0	1	0.4	1	3	2	0.7	0	0	0	0	14	0.9	n/a
Total	600	100	159	100	60	100	206	100	243	100	33	100	286	100	54	100	6	100	1647	100	100

Census Data Source: 2011 Census of Population and Housing. Table generated using ABS TableBuilder.
Note: 2011 Census data is for population aged 60 and above living in Brisbane City Council Local Government Area.

Table 30 Highest level of education completed by Participants by treatment

	HEC ONLY		ES ONLY		HEC & ES		HEC COMPARISON		ES COMPARISON		ES INFORMATION		HEC& ES INFORMATION		HEC (PILOT)		ES (PILOT)		TOTAL		2011 CENSUS DATA
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	%
Primary school	145	24.2	18	11.3	11	18.3	68	33	29	11.9	3	9.1	89	31.1	10	18.5	2	33.3	375	22.8	21.8
High school – year 10	214	35.7	45	28.3	23	38.3	84	40.8	78	32.1	10	30.3	99	34.6	12	22.2	1	16.7	566	34.4	33.8
High school – year 12	99	16.5	15	9.4	3	5	22	10.7	27	11.1	3	9.1	31	10.8	0	0	0	0	200	12.1	43.8
TAFE	46	7.7	19	11.9	6	10	14	6.8	30	12.3	3	9.1	24	8.4	5	9.3	0	0	147	8.9	0.2
Tertiary / University degree	94	15.7	58	36.5	15	25	18	8.7	78	32.1	13	39.4	40	14	4	7.4	3	50	323	19.6	0.4
Response not stated	2	0.3	4	2.5	2	3.3	0	0	1	0.4	1	3	3	1	23	42.6	0	0	36	2.2	
Total	**600**	**100**	**159**	**100**	**60**	**100**	**206**	**100**	**243**	**100**	**33**	**100**	**286**	**100**	**54**	**100**	**6**	**100**	**1647**	**100**	**100**

Census Data Source: 2011 Census of Population and Housing. Table generated using ABS TableBuilder.
Note: 2011 Census data is for population aged 60 and above living in Brisbane City Council Local Government Area.

Table 31 Participants' employment status

		HEC ONLY		ES SESSIONS ONLY		HEC& ES SESSIONS		HEC COMPARISON		ES COMPARISON		ES INFORMATION		HEC& ES INFORMATION		HEC (PILOT)		ES (PILOT)		TOTAL		2011 CENSUS DATA
		N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	%
Retired	Not in labour force (ABS)	589	98.2	143	89.9	56	93.3	201	97.6	219	90.1	28	84.8	275	96.2	31	57.4	6	100	1548	94	68.1
Conducting unpaid work (carer/home duties)		2	0.3	1	0.6	1	1.7	1	0.5	4	1.6	3	9.1	0	0	0	0	0	0	12	0.7	
Unable to work		0	0	2	1.3	1	1.7	1	0.5	1	0.4	0	0	2	0.7	0	0	0	0	7	0.4	
Employed full-time		1	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.1	13.1
Employed part-time		2	0.3	4	2.5	2	3.3	2	1	11	4.5	1	3	4	1.4	0	0	0	0	26	1.6	9.2
Employed, away from work		0	0	2	1.3	0	0	0	0	1	0.4	0	0	0	0	0	0	0	0	3	0.2	1.7
Unemployed, looking for full-time work		0	0	0	0	0	0	0	0	1	0.4	0	0	0	0	0	0	0	0	1	0.1	0.4
Unemployed, looking for part-time work		0	0	2	1.3	0	0	0	0	1	0.4	0	0	0	0	0	0	0	0	3	0.2	0.3
Studying		0	0	0	0	0	0	0	0	1	0.4	0	0	0	0	0	0	0	0	1	0.1	0.67
Other		4	0.7	0	0	0	0	1	0.5	2	0.8	0	0	2	0.7	0	0	0	0	9	0.5	n/a
Response not stated		2	0.3	5	3.1	0	0	0	0	2	0.8	1	3	3	1	23	42.6	0	0	36	2.2	7.1
Total		**600**	**100**	**159**	**100**	**60**	**100**	**206**	**100**	**243**	**100**	**33**	**100**	**286**	**100**	**54**	**100**	**6**	**100**	**1647**	**100**	**100**

Census Data Source: 2011 Census of Population and Housing. Table generated using ABS TableBuilder.
Note: 2011 Census data is for population aged 60 and above living in Brisbane City Council Local Government Area.

Table 32 Total gross household income of Participants by treatment

	HEC ONLY		ES ONLY		HEC & ES		HEC COMPARISON		ES COMPARISON		ES INFORMATION		HEC& ES INFORMATION		HEC (PILOT)		ES (PILOT)		TOTAL		2011 CENSUS DATA
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	%
Negative income	0	0	5	3.1	6	10	0	0	2	0.8	2	6.1	0	0	0	0	0	0	15	0.9	0.4
Nil income	0	0	3	1.9	0	0	0	0	13	5.3	0	0	0	0	0	0	0	0	16	1.0	3.9
1- $199 per week *($10,399 per year*)	2	0.3	2	1.3	0	0	0	0	24	9.9	5	15.2	0	0	0	0	0	0	33	2.0	4.8
$200 - $299 per week *($10,400 - $15,599 per year)*	3	0.5	12	7.5	5	8.3	6	2.9	40	16.5	14	42.4	2	0.7	1	1.9	0	0	83	5.0	15.9
$300 - $399 per week *($15,600 - $20,799 per year)*	47	7.8	7	4.4	4	6.7	22	10.7	42	17.3	2	6.1	1	0.3	3	5.6	3	50	131	8.0	16.2
$400 - $599 per week *($20,800 - $31,199 per year)*	230	38.3	44	27.7	9	15	74	35.9	27	11.1	0	0	3	1	22	40.7	1	16.7	410	24.9	19.6
$600 - $799 per week *($31,200 - $41,599 per year)*	76	12.7	16	10.1	6	10	6	2.9	19	7.8	0	0	33	11.5	3	5.6	1	16.7	160	9.7	8.6
$800 - $999 per week *($41,600 - $51,999 per year)*	99	16.5	3	1.9	7	11.7	9	4.4	12	4.9	2	6.1	112	39.2	1	1.9	0	0	245	14.9	5.5
$1,000 - $1,249 per week *($52,000 - $64,999 per year)*	20	3.3	6	3.8	1	1.7	0	0	11	4.5	1	3	38	13.3	0	0	1	16.7	78	4.7	4.7
$1,250 - $1,499 per week *($65,000 - $77,999 per year)*	3	0.5	5	3.1	0	0	0	0	4	1.6	0	0	15	5.2	1	1.9	0	0	28	1.7	3.0
$1,500 - $1,999 per week *($78,000 - $103,999 per year)*	3	0.5	2	1.3	0	0	0	0	31	12.8	5	15.2	2	0.7	0	0	0	0	43	2.6	3.4
$2,000 or more per week *($104,000 or more per year)*	1	0.2	1	0.6	0	0	0	0	0	0	0	0	2	0.7	0	0	0	0	4	0.2	4.5
Prefer not to say	83	13.8	39	24.5	17	28.3	89	43.2	6	2.5	0	0	1	0.3	0	0	0	0	235	14.3	9.5
Response not stated	33	5.5	14	8.8	5	8.3	0	0	12	4.9	2	6.1	77	26.9	23	42.6	0	0	166	10.1	-
Total	**600**	**100**	**159**	**100**	**60**	**100**	**206**	**100**	**243**	**100**	**33**	**100**	**286**	**100**	**54**	**100**	**6**	**100**	**1647**	**100**	**100**

Census Data Source: 2011 Census of Population and Housing. Table generated using ABS TableBuilder.
Note: 2011 Census data is for population aged 60 and above living in Brisbane City Council Local Government Area.

Table 33 Type of Participants' homes by treatment

	HEC ONLY		ES ONLY		HEC & ES		HEC COMPARISON		ES COMPARISON		ES INFORMATION		HEC& ES INFORMATION		HEC (PILOT)		ES (PILOT)		TOTAL		2011 CENSUS DATA
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	%
Detached house	483	80.5	124	78	34	56.7	188	91.3	195	80.2	24	72.7	211	73.8	53	98.1	6	100	1318	80	78.6
Semi-detached house (i.e. terrace or duplex house)	58	9.7	15	9.4	5	8.3	2	1	17	7	3	9.1	29	10.1	1	1.9	0	0	130	7.9	8.1
Flat, unit or apartment	31	5.2	11	6.9	19	31.7	15	7.3	23	9.5	5	15.2	2	0.7	0	0	0	0	106	6.4	12.6
Other	26	4.3	2	1.3	2	3.3	1	0.5	5	2.1	0	0	42	14.7	0	0	0	0	78	4.7	0.7
Response not stated	2	0.3	7	4.4	0	0	0	0	3	1.2	1	3	2	0.7	0	0	0	0	15	0.9	
Total	600	100	159	100	60	100	206	100	243	100	33	100	286	100	54	100	6	100	1647	100	100

Census Data Source: 2011 Census of Population and Housing. Table generated using ABS TableBuilder.
Note: 2011 Census data is for population aged 60 and above living in Brisbane City Council Local Government Area.

Table 34 Age of Participants' homes by treatment

	HEC ONLY		ES ONLY		HEC & ES		HEC COMPARISON		ES COMPARISON		ES INFORMATION		HEC& ES INFORMATION		TOTAL	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Under 5 years old	4	0.7	3	1.9	2	3.3	1	0.5	4	1.6	1	3	7	2.4	22	1.4
Between 5 to 9 years old	31	5.2	6	3.8	3	5	2	1	11	4.5	1	3	6	2.1	60	3.8
Between 10 to 14 years old	21	3.5	14	8.8	7	11.7	19	9.2	18	7.4	1	3	9	3.1	89	5.6
Between 15 to 19 years old	46	7.7	14	8.8	6	10	22	10.7	23	9.5	2	6.1	39	13.6	152	9.6
Between 20 to 29 years old	153	25.5	26	16.4	13	21.7	27	13.1	43	17.7	9	27.3	79	27.6	350	22.1
Between 30 to 39 years old	84	14	14	8.8	10	16.7	26	12.6	38	15.6	1	3	23	8	196	12.4
Between 40 to 49 years old	86	14.3	21	13.2	9	15	27	13.1	35	14.4	5	15.2	26	9.1	209	13.2
Between 50 to 59 years old	76	12.7	19	11.9	5	8.3	37	18	31	12.8	3	9.1	35	12.2	206	13.0
Over 60 years old	97	16.2	35	22	5	8.3	45	21.8	38	15.6	9	27.3	59	20.6	288	18.1
Response not stated	2	0.3	7	4.4	0	0	0	0	2	0.8	1	3	3	1	15	0.9
Total	600	100	159	100	60	100	206	100	243	100	33	100	286	100	1587	100.0

Note: This information was not collected for pilot participants (n=60)

Table 35 Number of bedrooms in Participants' homes by treatment

	HEC ONLY		ES ONLY		HEC & ES		HEC COMPARISON		ES COMPARISON		ES INFORMATION		HEC& ES INFORMATION		HEC (PILOT)		ES (PILOT)		TOTAL		2011 CENSUS DATA
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	%
1	7	1.2	2	1.3	2	3.3	3	1.5	4	1.6	2	6.1	9	3.1	0	0	0	0	29	1.8	4.7
2	142	23.7	30	18.9	17	28.3	29	14.1	40	16.5	6	18.2	88	30.8	7	13	1	16.7	360	21.9	16.0
3	327	54.5	66	41.5	29	48.3	130	63.1	122	50.2	12	36.4	138	48.3	37	68.5	3	50	864	52.5	45.7
4	100	16.7	47	29.6	12	20	40	19.4	62	25.5	11	33.3	44	15.4	7	13	2	33.3	325	19.7	26.4
5	20	3.3	5	3.1	0	0	4	1.9	9	3.7	1	3	3	1	3	5.6	0	0	45	2.7	5.8
More than 5	1	0.2	1	0.6	0	0	0	0	4	1.6	0	0	2	0.7	0	0	0	0	8	0.5	1.4
Response not stated	3	0.5	8	5	0	0	0	0	2	0.8	1	3	2	0.7	0	0	0	0	16	1	
Total	600	100	159	100	60	100	206	100	243	100	33	100	286	100	54	100	6	100	1647	100	100

Census Data Source: 2011 Census of Population and Housing. Table generated using ABS TableBuilder.
Note: 2011 Census data is for population aged 60 and above living in Brisbane City Council Local Government Area.

Table 36 Number of people in household by treatment

	HEC ONLY		ES ONLY		HEC & ES		HEC COMPARISON		ES COMPARISON		ES INFORMATION		HEC& ES INFORMATION		HEC (PILOT)		ES (PILOT)		TOTAL	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
1	337	56.2	71	44.7	26	43.3	7	3.4	112	46.1	17	51.5	153	53.5	29	53.7	3	50	755	45.8
2	223	37.2	62	39	27	45	73	35.4	93	38.3	10	30.3	112	39.2	19	35.2	2	33.3	621	37.7
3	17	2.8	14	8.8	2	3.3	7	3.4	16	6.6	3	9.1	16	5.6	6	11.1	0	0	81	4.9
4	6	1	3	1.9	1	1.7	2	1	5	2.1	1	3	1	0.3	0	0	1	16.7	20	1.2
5	3	0.5	2	1.3	2	3.3	1	0.5	1	0.4	0	0	0	0	0	0	0	0	9	0.5
6 or more	14	2.3	6	3.8	2	3.3	3	1.5	7	2.9	2	6.1	4	1.4	0	0	0	0	38	2.3
Response not stated	0	0	1	0.6	0	0	113	54.9	9	3.7	0	0	0	0	0	0	0	0	123	7.5
Total	600	100	159	100	60	100	206	100	243	100	33	100	286	100	54	100	6	100	1647	100

Table 37 Country of birth by treatment

	HEC ONLY		ES ONLY		HEC & ES		HEC COMPARISON		ES COMPARISON		ES INFORMATION		HEC& ES INFORMATION		HEC (PILOT)		ES (PILOT)		TOTAL		2011 CENSUS DATA
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	%
Australia	505	84.2	118	74.2	47	78.3	176	85.4	185	76.1	22	66.7	227	79.4	25	46.3	6	100	1311	79.6	65.8
England	39	6.5	11	6.9	5	8.3	16	7.8	23	9.5	5	15.2	19	6.6	4	7.4	0	0	122	7.4	7.2
New Zealand	6	1	9	5.7	0	0	2	1	6	2.5	2	6.1	4	1.4	0	0	0	0	29	1.8	2.8
Scotland	3	0.5	1	0.6	2	3.3	0	0	4	1.6	1	3	3	1	0	0	0	0	14	0.9	1.3
Germany	5	0.8	1	0.6	0	0	1	0.5	2	0.8	0	0	2	0.7	0	0	0	0	11	0.7	1.2
Italy	5	0.8	0	0	0	0	0	0	1	0.4	0	0	3	1	1	1.9	0	0	10	0.6	2.0
Netherlands	5	0.8	0	0	0	0	0	0	3	1.2	0	0	0	0	1	1.9	0	0	9	0.5	0.7
China	1	0.2	2	1.3	0	0	0	0	1	0.4	1	3	0	0	0	0	0	0	5	0.3	2.1
South Africa	3	0.5	0	0	0	0	0	0	2	0.8	0	0	2	0.7	0	0	0	0	7	0.4	0.65
Vietnam	0	0	0	0	0	0	0	0	2	0.8	0	0	0	0	0	0	0	0	2	0.1	0.1
India	3	0.5	0	0	1	1.7	2	1	1	0.4	0	0	4	1.4	0	0	0	0	11	0.7	0.75
Ireland	5	0.8	2	1.3	1	1.7	2	1	1	0.4	0	0	4	1.4	0	0	0	0	15	0.9	0.5
Other	18	3	10	6.3	4	6.7	7	3.4	9	3.7	1	3	15	5.2	0	0	0	0	64	3.9	8.4
Response not stated	2	0.3	5	3.1	0	0	0	0	3	1.2	1	3	3	1	23	42.6	0	0	37	2.2	6.5
Total	600	100	159	100	60	100	206	100	243	100	33	100	286	100	54	100	6	100	1647	100	100

Census Data Source: 2011 Census of Population and Housing. Table generated using ABS TableBuilder. Note: 2011 Census data is for population aged 60 and above living in Brisbane City Council Local Government Area.

A.3 Home energy use tables

Table 38 Energy sources used in the home

	HEC ONLY		ES ONLY		HEC & ES		HEC COMPARISON		ES COMPARISON		ES INFORMATION		HEC& ES INFORMATION		HEC (PILOT)		ES (PILOT)		TOTAL	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Electricity	600	100	158	99.4	59	98.3	200	97.1	239	98.4	32	97	286	100	54	100	6	100	1634	99.2
Gas (mains)	106	17.7	42	26.4	15	25	24	11.7	54	22.2	7	21.2	60	21	13	24.1	0	0	321	19.5
Gas (bottled)	44	7.3	24	15.1	1	1.7	19	9.2	32	13.2	6	18.2	18	6.3	7	13	0	0	151	9.2
Solar	112	18.7	52	32.7	10	16.7	71	34.5	97	39.9	10	30.3	44	15.4	0	0	0	0	396	24.0
Wood	10	1.7	6	3.8	1	1.7	2	1	7	2.9	0	0	2	0.7	0	0	0	0	28	1.7
Other	1	0.2	2	1.3	0	0	3	1.5	4	1.6	0	0	0	0	0	0	0	0	10	0.6

Note: Participants were able to select as many options as applied. The percentage reported here is the percentage of respondents (from the total that answered this question for each category) that reported using each energy source

Table 39 Solar PV system installed in the home

	HEC ONLY		ES ONLY		HEC & ES		HEC COMPARISON		ES COMPARISON		ES INFORMATION		HEC& ES INFORMATION		HEC (PILOT)		ES (PILOT)		TOTAL	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	M	%	N	%
No	488	81.3	110	69.2	44	73.3	19	9.2	137	56.4	17	51.5	238	83.2	0	0	0	0	1053	63.9
Yes	112	18.7	42	26.4	9	15	52	25.2	88	36.2	10	30.3	47	16.4	0	0	0	0	360	21.9
Response not stated	0	0	7	4.4	7	11.7	135	65.5	18	7.4	6	18.2	1	0.3	54	100	6	100	234	14.2
Total	600	100	159	100	60	100	206	100	243	100	33	100	286	100	54	100	6	100	1647	100

Table 40 Type of hot water system used in the home

	HEC ONLY		ES ONLY		HEC & ES		HEC COMPARISON		ES COMPARISON		ES INFORMATION		HEC& ES INFORMATION		HEC (PILOT)		ES (PILOT)		TOTAL	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Electric instantaneous	34	5.7	7	4.4	2	3.3	22	10.7	12	4.9	3	9.1	7	2.4	0	0	0	0	87	5.3
Electric with storage	388	64.7	78	49.1	35	58.3	101	49	130	53.5	15	45.5	192	67.1	40	74.1	3	50	982	59.6
Gas instantaneous	61	10.2	17	10.7	11	18.3	12	5.8	21	8.6	2	6.1	18	6.3	6	11.1	0	0	148	9.0
Gas with storage	43	7.2	20	12.6	4	6.7	11	5.3	26	10.7	5	15.2	34	11.9	7	13	0	0	150	9.1
Heat pump	16	2.7	3	1.9	0	0	2	1	5	2.1	2	6.1	0	0	0	0	1	16.7	29	1.8
Solar with electric booster	49	8.2	31	19.5	5	8.3	21	10.2	35	14.4	4	12.1	27	9.4	0	0	0	0	172	10.4
Solar with gas booster	2	0.3	0	0	1	1.7	0	0	2	0.8	0	0	1	0.3	0	0	0	0	6	0.4
Solar	3	0.5	1	0.6	0	0	6	2.9	1	0.4	0	0	2	0.7	0	0	2	33.3	15	0.9
Response not stated	4	0.7	2	1.3	2	3.3	31	15	11	4.5	2	6.1	5	1.7	1	1.9	0	0	58	3.5
Total	600	100	159	100	60	100	206	100	243	100	33	100	286	100	54	100	6	100	1647	100

Table 41 Type of insulation in the home

	HEC ONLY		ES ONLY		HEC & ES		HEC COMPARISON		ES COMPARISON		ES INFORMATION		HEC& ES INFORMATION		HEC (PILOT)		ES (PILOT)		TOTAL	
Ceiling	446	74.3	127	79.9	53	88.3	152	73.8	185	76.1	27	81.8	204	71.3	46	85.2	6	100	1246	75.7
Wall	44	7.3	25	15.7	9	15	7	3.4	30	12.3	6	18.2	12	4.2	6	11.1	0	0	139	8.4
Floor	5	0.8	6	3.8	14	23.3	1	0.5	3	1.2	0	0	16	5.6	1	1.9	0	0	46	2.8
Hot water piping lagging	0	0	16	10.1	3	5	0	0	20	8.2	3	9.1	0	0	8	14.8	0	0	50	3.0
Hot water cylinders lagging	102	17.0	8	5.0	8	5.0	0	0.0	9	3.7	3	9.1	74	25.9	16	29.6	0	0	220	13.4

Table 42 Type of cooling system used in the home

	HEC ONLY		ES ONLY		HEC & ES		HEC COMPARISON		ES COMPARISON		ES INFORMATION		HEC& ES INFORMATION		HEC (PILOT)		ES (PILOT)		TOTAL	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Ceiling fan	381	63.5	105	66	46	76.7	158	76.7	168	69.1	19	57.6	214	74.8	34	63	2	33.3	1127	68.4
Portable fan	356	59.3	66	41.5	33	55	151	73.3	147	60.5	17	51.5	165	57.7	35	64.8	2	33.3	972	59.0
Wall mounted split system air conditioner	304	50.7	75	47.2	42	70	99	48.1	161	66.3	19	57.6	132	46.2	0	0	0	0	832	50.5
Other Wall/window mounted air-conditioner	56	9.3	14	8.8	15	25	38	18.4	25	10.3	1	3	30	10.5	16	29.6	1	16.7	196	11.9
Ducted air-conditioner	30	5	20	12.6	9	15	5	2.4	17	7	3	9.1	29	10.1	0	0	0	0	113	6.9
Small/Portable air-conditioner	15	2.5	10	6.3	2	3.3	4	1.9	10	4.1	0	0	3	1	0	0	0	0	44	2.7

Table 43 Type of heating system in the home

	HEC ONLY		ES ONLY		HEC & ES		HEC COMPARISON		ES COMPARISON		ES INFORMATION		HEC& ES INFORMATION		HEC (PILOT)		ES (PILOT)		TOTAL	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Reverse-cycle air conditioner	383	63.8	81	50.9	50	83.3	95	46.1	150	61.7	16	48.5	178	62.2	0	0	2	33.3	955	58
Gas heater	5	0.8	6	3.8	0	0	4	1.9	6	2.5	0	0	6	2.1	54	100	0	0	81	4.9
Direct electric heater	9	1.5	17	10.7	0	0	17	8.3	14	5.8	1	3	4	1.4	0	0	0	0	62	3.8
Wood	18	3	5	3.1	3	5	2	1	7	2.9	1	3	5	1.7	0	0	0	0	41	2.5
Electric bar heater	37	6.2	22	13.8	9	15	36	17.5	39	16	5	15.2	19	6.6	0	0	0	0	167	10.1
Column oil heater	65	10.8	22	13.8	7	11.7	27	13.1	38	15.6	4	12.1	22	7.7	0	0	0	0	185	11.2

Table 44 Type of lighting in the home

	HEC ONLY		ES ONLY		HEC & ES		HEC COMPARISON		ES COMPARISON		ES INFORMATION		HEC& ES INFORMATION		HEC (PILOT)		TOTAL	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Compact Fluorescent lamps (CFLs)	541	90.2	119	74.8	58	96.7	164	79.6	206	100.0	26	78.8	249	87.1	44	81.5	1407	85.7
Incandescent (GLS)	286	47.7	72	45.3	22	36.7	25	12.1	128	62.1	13	39.4	151	52.8	28	51.9	725	44.2
Halogen lights	87	14.5	63	39.6	23	38.3	47	22.8	110	53.4	11	33.3	56	19.6	13	24.1	410	25.0
Light emitting diode (LED)	46	7.7	32	20.1	8	13.3	6	2.9	62	30.1	7	21.2	21	7.3	2	3.7	184	11.2

Table 45 Other energy efficiency features in the home

	HEC ONLY		ES ONLY		HEC & ES		HEC COMPARISON		ES COMPARISON		ES INFORMATION		HEC& ES INFORMATION		HEC (PILOT)		ES (PILOT)		TOTAL	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Single glaze windows	592	98.7	111	69.8	59	98.3	156	75.7	177	72.8	23	69.7	278	97.2	48	88.9	1	16.7	1445	87.7
Double glaze windows	8	1.3	5	3.1	1	1.7	11	5.3	11	4.5	0	0	10	3.5	1	1.9	0	0	47	2.9
Tinted windows	113	18.8	31	19.5	12	20	35	17	63	25.9	7	21.2	33	11.5	6	11.1	0	0	300	18.2
Draught proof windows	504	84	21	13.2	57	95	13	6.3	42	17.3	9	27.3	230	80.4	44	81.5	2	33.3	922	56
Draught proof doors	451	75.2	20	12.6	52	86.7	26	12.6	45	18.5	8	24.2	222	77.6	39	72.2	2	33.3	865	52.5
Curtains	462	77	117	73.6	47	78.3	176	85.4	183	75.3	26	78.8	221	77.3	0	0	6	100	1238	75.2
Internal blinds or shutters	460	76.7	120	75.5	50	83.3	174	84.5	183	75.3	21	63.6	236	82.5	0	0	4	66.7	1248	75.8
External blinds, shutters or awnings	368	61.3	49	30.8	38	63.3	127	61.7	92	37.9	10	30.3	171	59.8	0	0	2	33.3	857	52

Table 46 Appliances and technology in the home

	HEC ONLY		ES ONLY		HEC & ES		HEC COMPARISON		ES COMPARISON		ES INFORMATION		HEC& ES INFORMATION		HEC (PILOT)		ES (PILOT)		TOTAL	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Fridge	597	99.5	139	87.4	60	100	206	100	220	90.5	30	90.9	281	98.3	53	98.1	0	0	1586	96.3
Microwave	572	95.3	149	93.7	60	100	198	96.1	230	94.7	33	100	269	94.1	51	94.4	5	83.3	1567	95.1
LCD Television (Flat-screen TV)	597	99.5	103	64.8	60	100	174	84.5	165	67.9	21	63.6	280	97.9	33	61.1	0	0	1433	87.0
Electric Oven	521	86.8	121	76.1	58	96.7	175	85	207	85.2	29	87.9	226	79	0	0	6	100	1343	81.5
Water-saving showerhead(s)	499	83.2	131	82.4	60	100	162	78.6	191	78.6	27	81.8	228	79.7	0	0	0	0	1298	78.8
Top loading washing machine	483	80.5	103	64.8	51	85	169	82	173	71.2	20	60.6	241	84.3	41	75.9	6	100	1287	78.1
Desktop Computer	596	99.3	97	61	60	100	79	38.3	138	56.8	13	39.4	279	97.6	17	31.5	0	0	1279	77.7
Laptop Computer	595	99.2	85	53.5	60	100	46	22.3	137	56.4	17	51.5	278	97.2	16	29.6	0	0	1234	74.9
Electric Stovetop	464	77.3	100	62.9	52	86.7	169	82	172	70.8	24	72.7	214	74.8	0	0	5	83.3	1200	72.9
Plasma Television (Flat-screen TV)	597	99.5	64	40.3	60	100	25	12.1	87	35.8	14	42.4	280	97.9	19	35.2	0	0	1146	69.6
CRT Television (Old style TV)	595	99.2	25	15.7	60	100	21	10.2	41	16.9	3	9.1	274	95.8	8	14.8	0	0	1027	62.4
Clothes Dryer	245	40.8	86	54.1	37	61.7	93	45.1	126	51.9	17	51.5	104	36.4	22	40.7	0	0	730	44.3
Dishwasher	221	36.8	76	47.8	31	51.7	53	25.7	142	58.4	12	36.4	87	30.4	18	33.3	2	33.3	642	39.0
Freezer (separate from fridge)	171	28.5	64	40.3	17	28.3	90	43.7	88	36.2	10	30.3	74	25.9	9	16.7	2	33.3	525	31.9
Gas Stovetop	129	21.5	54	34	11	18.3	38	18.4	67	27.6	9	27.3	66	23.1	0	0	1	16.7	375	22.8
Front loading washing machine	105	17.5	52	32.7	12	20	35	17	66	27.2	13	39.4	45	15.7	11	20.4	0	0	339	20.6
Gas Oven	67	11.2	28	17.6	3	5	31	15	34	14	4	12.1	53	18.5	0	0	0	0	220	13.4

Table 47 Self-reported energy efficient modifications/appliances installed during the course of the program (excludes modifications/appliances provided by the GHW program)

	HEC ONLY (N=600)		ES ONLY (N=159)		HEC & ES (N=60)		HEC COMPARISON (N=206)		ES COMPARISON (N=243)		ES INFORMATION (N=33)		HEC & ES INFORMATION (N=286)		HEC PILOT (N=54)		TOTAL	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Washing machine	8	1.3	4	2.5	1	1.7	6	2.9	12	4.9	2	6.1	4	1.4	2	3.7	39	2.4
Fridge	5	0.8	3	1.9	1	1.7	5	2.4	13	5.3	0	0.0	5	1.7	0	0.0	32	1.9
Hot water system	6	1.0	4	2.5	2	3.3	1	0.5	8	3.3	2	6.1	5	1.7	0	0.0	28	1.7
Air conditioner	6	1.0	0	0.0	0	0.0	2	1.0	7	2.9	1	3.0	1	0.3	2	3.7	18	1.1
Solar panels	4	0.7	0	0.0	0	0.0	0	0.0	4	1.6	1	3.0	0	0.0	2	3.7	11	0.7
Insulation	1	0.2	0	0.0	0	0.0	0	0.0	0	0.0	1	3.0	0	0.0	0	0.0	2	0.1
Other large appliance																		
Clothes dryer	1	0.2	0	0.0	0	0.0	0	0.0	2	0.8	0	0.0	1	0.3	0	0.0	4	
Dishwasher	0	0.0	1	0.6	1	0.0	3	1.5	3	1.2	0	0.0	0	0.0	0	0.0	8	
Freezer	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.3	0	0.0	1	
Microwave	3	0.5	1	0.6	0	0.0	0	0.0	1	0.4	0	0.0	1	0.3	0	0.0	3	
Television	3	0.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.3	0	0.0	4	
Oven and/or stove	3	0.5	1	0.6	0	0.0	1	0.5	2	0.8	0	0.0	1	0.3	0	0.0	8	

CONTINUATION OF TABLE 47	HEC ONLY (N=600)		ES ONLY (N=159)		HEC & ES (N=60)		HEC COMPARISON (N=206)		ES COMPARISON (N=243)		ES INFORMATION (N=33)		HEC & ES INFORMATION (N=286)		HEC PILOT (N=54)		TOTAL	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Other modifications																		
Ceiling fans	3	0.5	0	0.0	0	0.0	0	0.0	1	0.4	6	18.2	0	0.0	0	0.0	10	0.6
Light (other/unknown)	3	0.5	0	0.0	0	0.0	0	0.0	1	0.4	1	3.0	1	0.3	0	0.0	6	0.4
Light (CFL)	4	0.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.3	0	0.0	5	0.3
Standby power controller	1	0.2	0	0.0	1	1.7	0	0.0	0	0.0	0	0.0	3	1.0	0	0.0	5	0.3
Fan (other/unknown)	1	0.2	1	0.6	0	0.0	0	0.0	0	0.0	0	0.0	1	0.3	0	0.0	3	0.2
Light (LED)	1	0.2	0	0.0	0	0.0	0	0.0	1	0.4	0	0.0	0	0.0	0	0.0	2	0.1
Showerhead	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.3	0	0.0	1	0.1
Draft-proof	1	0.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.1
Portable heater	1	0.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.1

Note: ‘Other large appliance’ and ‘Other modification’ were open questions

A.4 Self-reported attitudes and behaviour

Table 48 Frequency of energy saving actions performed by participants at home before and after the GHW program

		HEC ONLY			ES ONLY			HEC & ES			HEC COMPARISON			ES COMPARISON			ES INFORMATION			HEC& ES INFORMATION		
	PROGRAM SURVEY	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD
Use fans or natural ventilation for cooling the house	PRE	517	**4.46**	0.85	121	**4.10**	0.91	48	**3.94**	0.86	196	**4.29**	1.02	235	4.04	0.88	31	**3.94**	1.18	242	4.42	0.79
	POST	517	**4.58****	0.68	121	**4.31****	0.86	48	**4.60*****	0.57	196	**4.09***	0.87	235	4.12	0.71	31	**4.39***	0.84	242	4.31	0.83
Shut blinds/curtains to reduce heat getting into/out of the home	PRE	514	**4.37**	1.07	118	**3.85**	1.09	47	**3.68**	1.11	188	**3.85**	1.28	228	3.91	1.02	31	**3.77**	1.02	238	**4.27**	1.17
	POST	514	**4.62*****	0.83	118	**4.15*****	1.09	47	**4.36****	1.07	188	**3.11****	1.17	228	3.97	1.02	31	**4.26*****	0.89	238	**3.50*****	1.39
Close off areas that do not need to be cooled in summer or heated in winter	PRE	420	4.51	0.91	109	**3.95**	1.13	45	**3.58**	1.20	161	**3.57**	1.43	214	**4.04**	1.07	29	**3.59**	1.40	193	**4.50**	1.13
	POST	420	4.60	0.86	109	**4.19***	0.99	45	**4.29*****	1.25	161	**2.96*****	1.24	214	**4.23****	0.97	29	**4.21***	1.08	193	**3.63*****	1.41
Set the air conditioning to 25°C or more in summer	PRE	196	**1.40**	1.01	68	**3.41**	1.54	35	3.31	1.47	93	1.06	0.32	166	**3.02**	1.43	19	3.47	1.54	80	1.81	1.42
	POST	196	**2.80*****	1.80	68	**3.91****	1.27	35	2.69	1.66	93	1.13	0.37	166	**3.49*****	1.43	19	3.95	1.43	80	1.95	1.30
Set the heater to 18°C or less in winter	PRE	n/a	n/a	n/a	50	**2.76**	1.44	18	2.83	1.38	81	1.01	0.11	113	**2.43**	1.42	13	3.08	1.55	n/a	n/a	n/a
	POST	n/a	n/a	n/a	50	**3.40****	1.50	18	2.89	1.81	81	1.06	0.24	113	**3.06*****	1.42	13	3.54	1.33	n/a	n/a	n/a

N = total number of responses for each question, M = mean, SD = Standard Deviation. Participants were asked to rate the frequency of their behaviour on a five point Likert scale, where 1 = Never, 2= Rarely, 3 = Some of the time; 4= Most of the time; and 5 = All the time. Responses to '6= I do not have this technology at home' or 'Not applicable' were excluded from the analysis. Mean comparison tests (t-tests) were performed to compare participants' responses in the pre-program and post-program surveys. T-tests were statistically significant at *p<0.05; **p<0.01; ***p<0.001.

CONT'D		HEC ONLY			ES ONLY			HEC & ES			HEC COMPARISON			ES COMPARISON			ES INFORMATION			HEC& ES INFORMATION		
	PROGRAM SURVEY	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD
Wash clothes in cold water	PRE	n/a	n/a	n/a	123	**4.54**	0.88	46	4.67	0.79	195	4.47	1.25	232	**4.24**	1.22	31	4.65	1.05	238	4.39	1.19
	POST	n/a	n/a	n/a	123	**4.74****	0.73	46	4.54	1.15	195	4.58	1.12	232	**4.33***	1.16	31	4.74	0.86	238	4.51	1.07
Hang out clothes to dry naturally	PRE	190	**4.23**	0.92	123	**4.65**	0.74	45	4.84	0.52	195	4.79	0.77	232	4.72	0.73	29	4.90	0.41	77	4.35	0.94
	POST	190	**4.66*****	0.88	123	**4.84*****	0.53	45	4.78	0.67	195	4.83	0.62	232	4.78	0.54	29	4.93	0.26	77	4.40	1.16
Use the clothes dryer	PRE	202	2.19	0.77	82	**2.07**	0.90	33	2.21	0.86	86	2.00	0.80	183	1.84	0.84	21	1.71	0.72	84	2.25	0.85
	POST	202	2.12	0.80	82	**1.90***	0.86	33	2.09	0.72	86	1.94	0.87	183	1.79	0.79	21	1.71	0.56	84	2.26	0.96
Run the washing machine with a full load only	PRE	515	**4.28**	0.78	124	**4.08**	0.84	48	**4.08**	0.96	193	4.75	0.54	229	4.23	0.85	29	**4.24**	0.69	236	4.17	1.02
	POST	515	**4.39****	0.76	124	**4.39*****	0.79	48	**4.50***	0.92	193	4.69	0.55	229	4.28	0.79	29	**4.52***	0.63	236	4.05	1.00
Consider energy efficient ratings when buying new appliances	PRE	300	**3.97**	1.23	119	**4.16**	1.03	35	4.03	0.95	191	4.36	1.04	217	**4.23**	0.93	31	4.29	0.86	175	3.65	1.50
	POST	300	**4.44*****	0.94	119	**4.49*****	0.77	35	4.29	0.96	191	4.44	0.80	217	**4.42*****	0.73	31	4.58	0.76	175	3.74	1.38

N = total number of responses for each question, M = mean, SD = Standard Deviation. Participants were asked to rate the frequency of their behaviour on a five point Likert scale, where 1 = Never, 2= Rarely, 3 = Some of the time; 4= Most of the time; and 5 = All the time. Responses to '6= I do not have this technology at home' or 'Not applicable' were excluded from the analysis. Mean comparison tests (t-tests) were performed to compare participants' responses in the pre-program and post-program surveys. T-tests were statistically significant at *p<0.05; **p<0.01; ***p<0.001.

CONT'D		HEC ONLY			ES ONLY			HEC & ES			HEC COMPARISON			ES COMPARISON			ES INFORMATION			HEC& ES INFORMATION		
	PROGRAM SURVEY	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD
Turn appliances and devices off at the power point	PRE	518	4.36	1.24	125	**3.62**	0.97	48	**3.63**	1.14	196	**4.13**	1.16	232	**3.63**	1.07	30	**3.73**	0.98	239	**3.80**	1.37
	POST	518	4.42	0.91	125	**4.01*** **	0.92	48	**4.27*** **	0.87	196	**4.31***	0.80	232	**3.82*** **	0.99	30	**4.10***	0.80	239	**4.05** **	1.01
Switch off the lights in rooms that are not being used	PRE	517	**4.79**	0.49	125	**4.36**	0.76	48	**4.54**	0.71	196	4.83	0.45	233	4.57	0.61	31	4.65	0.49	239	4.84	0.46
	POST	517	**4.87*** **	0.37	125	**4.58*** **	0.63	48	**4.83** **	0.52	196	4.81	0.42	233	4.60	0.58	31	4.77	0.43	239	4.85	0.41
Use a thermometer to check fridge and freezer temperature	PRE	509	**1.61**	1.01	111	**1.74**	1.29	45	2.04	1.49	n/a	n/a	n/a	187	1.95	1.39	26	**1.69**	1.16	235	**1.56**	1.14
	POST	509	**2.45*** **	1.33	111	**2.72*** **	1.54	45	2.31	1.43	n/a	n/a	n/a	187	2.06	1.40	26	**2.35*** **	1.41	235	**2.15*** **	1.27
Check the seals of refrigerator for leaks	PRE	495	**2.72**	1.41	119	**2.71**	1.29	45	**2.38**	1.21	n/a	n/a	n/a	195	**2.80**	1.39	28	2.75	1.46	216	2.45	1.33
	POST	495	**3.19*** **	1.44	119	**3.34*** **	1.28	45	**3.80*** **	1.20	n/a	n/a	n/a	195	**3.17*** **	1.36	28	3.25	1.38	216	2.46	1.28
Run the dishwasher with a full load only	PRE	170	4.65	0.75	52	4.46	0.98	21	4.57	0.60	n/a	n/a	n/a	103	4.47	0.93	9	4.22	1.30	59	4.63	0.69
	POST	170	4.59	0.96	52	4.60	0.89	21	4.95	0.22	n/a	n/a	n/a	103	4.48	0.95	9	4.44	0.53	59	4.58	0.86

N = total number of responses for each question, M = mean, SD = Standard Deviation. Participants were asked to rate the frequency of their behaviour on a five point Likert scale, where 1 = Never, 2= Rarely, 3 = Some of the time; 4= Most of the time; and 5 = All the time. Responses to '6= I do not have this technology at home' or 'Not applicable' were excluded from the analysis. Mean comparison tests (t-tests) were performed to compare participants' responses in the pre-program and post-program surveys. T-tests were statistically significant at *p<0.05; **p<0.01; ***p<0.001

Table 49 Attitudes towards energy usage (LIEEP Data Schema measures)

		HEC ONLY			ES ONLY			HEC & ES			HEC COMPARISON			ES COMPARISON			ES INFORMATION			HEC& ES INFORMATION		
	PROGRAM SURVEY	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD
How in control of your energy bills do you feel?	PRE	521	**3.90**	1.14	125	**3.34**	1.16	48	**3.38**	1.20	196	4.15	1.01	232	**3.72**	1.10	31	**3.48**	0.96	242	**3.41**	1.41
	POST	521	**4.19*** **	0.91	125	**3.99*** **	1.00	48	**4.33*** **	0.93	196	4.24	0.71	232	**3.91** **	1.06	31	**3.97** **	0.91	242	**4.04*** **	1.09
How comfortable do you feel at home without air-conditioning and/or heating appliances?	PRE	521	**3.03**	1.50	123	**3.02**	1.43	48	2.96	1.17	196	3.58	1.48	230	**3.03**	1.33	31	3.32	1.19	242	**3.04**	1.54
	POST	521	**3.18***	1.44	123	**3.39** **	1.33	48	2.98	1.52	196	3.45	1.47	230	**2.79** **	1.32	31	3.19	1.30	242	**2.59*** **	1.52
How empowered do you feel in relation to your energy consumption?	PRE	521	**3.89**	0.98	124	**3.44**	0.98	47	**3.62**	0.82	196	3.76	1.00	230	3.72	1.02	31	3.65	0.98	242	**3.69**	1.20
	POST	521	**4.02** **	0.85	124	**3.98*** **	0.90	47	**4.17** **	0.94	196	3.87	0.79	230	3.77	0.94	31	3.77	1.06	242	**3.98*** **	0.96
How interested are you in conserving energy in the home?	PRE	521	**4.76**	0.56	125	4.78	0.63	50	4.66	0.77	196	4.66	0.73	232	4.63	0.68	31	4.42	0.81	242	4.67	0.61
	POST	521	**4.86*** **	0.45	125	4.81	0.43	50	4.84	0.42	196	4.65	0.61	232	4.62	0.69	31	4.65	0.61	242	4.61	0.76
How would you rate your energy behaviour in the last 2 years (pre-program survey)/four months (post-program survey)?	PRE	521	**4.12**	0.87	125	**3.72**	0.81	50	**3.64**	0.88	196	**4.37**	0.86	230	3.90	0.75	30	3.97	0.72	242	**4.11**	1.01
	POST	521	**4.39*** **	0.75	125	**4.20*** **	0.64	50	**4.48*** **	0.74	196	**4.62*** **	0.56	230	3.98	0.78	30	3.93	0.74	242	**4.34** **	0.90

N = total number of responses for each question, M = mean, SD = Standard Deviation. Participants were asked to provide a response on a five point Likert scale. Mean comparison tests (t-tests) were performed to compare participants' responses in the pre-program and post-program surveys. T-tests were statistically significant at *p<0.05; **p<0.01; ***p<0.001

Table 50 Attitudes towards energy efficiency (LIEEP Data Schema measures)

		HEC ONLY			ES ONLY			HEC & ES			HEC COMPARISON			ES COMPARISON			ES INFORMATION			HEC& ES INFORMATION		
	PROGRAM SURVEY	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD
Energy efficiency is too much hassle	PRE	521	2.32	0.79	121	2.32	1.10	46	2.28	1.00	196	2.48	0.83	230	2.27	1.04	28	2.54	1.07	242	2.29	0.79
	POST	521	2.20***	0.63	121	1.86***	0.83	46	2.17	0.77	196	2.23***	0.62	230	2.07**	0.96	28	2.18*	0.77	242	2.16*	0.72
Energy efficiency means I have to live less comfortably	PRE	521	2.44	0.87	125	2.42	1.13	49	2.53	1.16	196	2.74	0.89	233	2.48	1.07	32	2.28	1.02	242	2.41	0.86
	POST	521	2.43	0.84	125	2.14**	1.03	49	2.18*	0.75	196	2.45***	0.79	233	2.39	1.07	32	2.06	1.08	242	2.15***	0.80
My quality of life will decrease when I reduce my energy use	PRE	521	2.70	0.98	123	2.66	1.23	49	2.55	1.14	196	2.93	0.85	236	2.68	1.13	32	2.44	1.22	242	2.67	1.01
	POST	521	2.76	0.97	123	2.17***	1.11	49	2.86	1.12	196	2.82	0.92	236	2.59	1.15	32	2.50	1.32	242	3.03***	1.14
Energy efficiency will restrict my freedom	PRE	521	2.16	0.57	124	2.16	1.11	47	1.96	1.02	196	2.58	0.78	234	2.07	0.91	31	2.10	1.14	242	2.18	0.59
	POST	521	2.16	0.56	124	1.82**	0.94	47	2.00	0.63	196	2.34***	0.70	234	2.08	0.99	31	2.06	1.12	242	2.06**	0.67
Energy efficiency is not very enjoyable	PRE	521	2.60	0.86	124	2.51	1.04	49	2.73	0.91	196	2.97	0.83	235	2.60	0.97	31	2.32	0.79	242	2.60	0.87
	POST	521	2.53	0.82	124	2.18**	0.98	49	2.49	0.84	196	2.47***	0.74	235	2.48	1.04	31	2.16	0.82	242	2.47	0.77

N = total number of responses for each question, M = mean, SD = Standard Deviation Participants were asked to provide a response on a five point Likert scale: 1= Strongly Disagree, 2= Disagree, 3= Neither Disagree nor Agree/Do not know, 4= Agree, and 5= Strongly Agree. Mean comparison tests (t-tests) were performed to compare participants' responses in the pre-program and post-program surveys T-tests were statistically significant at *p<0.05; **p<0.01; ***p<0.001

Table 51 Perceived power to change behaviour

		HEC ONLY			ES ONLY			HEC & ES			HEC COMPARISON			ES COMPARISON			ES INFORMATION			HEC& ES INFORMATION		
	PROGRAM SURVEY	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD
I find it difficult to improve the energy efficiency of my home	PRE	521	3.00	1.02	123	**3.33**	1.01	47	**3.43**	0.90	196	**3.14**	0.94	230	3.16	1.09	32	3.63	0.91	242	3.04	1.06
	POST	521	3.03	1.00	123	**2.67*** **	1.12	47	**2.98***	1.22	196	**2.87*** **	0.86	230	2.98	1.12	32	3.31	1.00	242	2.95	1.04
At the moment, I do not know how to save energy at home	PRE	521	**2.51**	0.89	124	**2.82**	1.15	47	**2.87**	1.08	196	**2.65**	0.84	234	**2.47**	1.08	32	3.00	1.02	242	**2.69**	0.99
	POST	521	**2.33*** **	0.79	124	**1.88*** **	0.91	47	**2.02*** **	0.74	196	**2.30*** **	0.58	234	**2.21*** **	0.96	32	2.50	1.27	242	**2.19*** **	0.97
I find it easy to save energy at home	PRE	521	3.69	0.74	124	**3.32**	1.06	49	**3.43**	1.00	196	3.73	0.59	232	3.46	0.97	32	3.44	1.01	242	3.55	0.84
	POST	521	3.78*	0.62	124	**3.73** *	1.13	49	**4.00*** **	0.65	196	3.75	0.56	232	3.56	0.96	32	3.94**	0.76	242	3.76	0.74

N = total number of responses for each question, M = mean, SD = Standard Deviation. Participants were asked to provide a response on a five point Likert scale : 1= Strongly Disagree, 2= Disagree, 3= Neither Disagree nor Agree/Do not know, 4= Agree, and 5= Strongly Agree. Mean comparison tests (t-tests) were performed to compare participants' responses in the pre-program and post-program surveys. T-tests were statistically significant at *p<0.05; **p<0.01; ***p<0.001

Table 52 Responses to statements regarding environmental behaviour

	PROGRAM SURVEY	HEC ONLY			ES ONLY			HEC & ES			HEC COMPARISON			ES COMPARISON			ES INFORMATION			HEC& ES INFORMATION		
		N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD
Australia's increased demand for energy is a problem for future generations	PRE	521	**3.99**	0.63	118	4.19	0.91	49	4.12	0.81	196	3.79	0.55	234	4.03	1.05	32	**3.88**	0.91	242	4.00	0.62
	POST	521	**3.89****	0.62	118	4.04	0.97	49	4.02	0.78	196	3.76	0.59	234	4.09	1.00	32	**4.31****	0.74	242	4.04	0.72
I feel partly responsible for the amount of energy Australia uses	PRE	521	2.95	1.00	117	3.08	1.01	46	3.13	1.09	196	**2.95**	0.91	233	**3.04**	1.02	32	2.91	0.96	242	**2.86**	0.98
	POST	521	2.96	0.98	117	3.20	1.04	46	2.98	1.09	196	**3.14***	0.95	233	**3.29*****	1.11	32	2.88	0.98	242	**2.64****	1.00
I feel morally obliged to save energy, regardless of what others do	PRE	521	**3.87**	0.64	122	**4.06**	0.77	49	4.18	0.53	196	3.77	0.59	235	**3.96**	0.85	31	3.94	0.85	242	**3.84**	0.68
	POST	521	**3.94***	0.47	122	**4.24****	0.76	49	4.02	0.72	196	3.73	0.64	235	**4.17*****	0.75	31	4.06	0.85	242	**4.38*****	0.69
Not only the government and industry are responsible for high energy consumption levels, but I am too	PRE	521	**3.37**	0.96	120	3.69	0.99	48	3.65	1.16	196	2.66	0.87	233	3.59	1.12	32	3.56	0.95	242	3.02	1.03
	POST	521	**3.25***	0.97	120	3.83	1.06	48	3.42	1.05	196	2.49	1.12	233	3.83	0.97	32	3.72	0.96	242	2.98	1.00
I feel guilty when I waste energy	PRE	521	3.63	0.86	120	3.79	0.88	47	3.74	0.94	196	3.49	0.78	231	**3.72**	0.94	32	3.78	0.87	241	**3.48**	0.91
	POST	521	3.66	0.76	120	3.93	0.90	47	3.57	0.99	196	3.47	0.76	231	**3.90****	0.89	32	3.75	0.72	241	**3.75*****	0.97
Energy savings help reduce climate change	PRE	521	3.54	0.80	119	**4.01**	1.00	47	3.81	0.82	196	3.52	0.59	233	3.86	1.05	29	3.93	0.96	242	**3.72**	0.74
	POST	521	3.50	0.79	119	**4.26****	0.84	47	3.72	0.85	196	3.52	0.63	233	3.96	1.05	29	4.03	0.87	242	**3.50*****	0.77
Climate change is a problem for society	PRE	521	3.73	0.77	122	**4.11**	1.03	49	4.00	0.87	196	3.51	0.61	231	4.06	1.03	31	4.10	0.94	242	3.88	0.64
	POST	521	3.68	0.74	122	**4.32***	0.87	49	3.73	0.97	196	3.53	0.60	231	4.10	1.02	31	4.19	0.83	242	3.81	0.86
I feel partly responsible for climate change	PRE	521	3.02	0.95	121	**3.13**	1.12	50	**3.24**	1.08	196	3.11	0.80	235	**3.17**	1.08	30	**2.97**	1.13	242	**2.95**	1.00
	POST	521	3.03	0.97	121	**3.39****	1.08	50	**2.92***	1.19	196	3.03	0.90	235	**3.34****	1.13	30	**3.43***	1.10	242	**2.74****	0.99
I feel a better person when I save energy	PRE	521	3.85	0.60	121	3.97	0.81	49	3.94	0.75	196	3.84	0.45	235	3.83	0.85	31	3.94	0.73	242	**3.84**	0.67
	POST	521	3.80	0.59	121	4.09	0.84	49	3.82	0.73	196	3.87	0.39	235	3.92	0.81	31	4.13	0.76	242	**3.98****	0.66

N = total number of responses for each question, *M* = mean, *SD* = Standard Deviation. Participants were asked to provide a response on a five point Likert scale: 1= Strongly Disagree, 2= Disagree, 3= Neither Disagree nor Agree/Do not know, 4= Agree, and 5= Strongly Agree. Mean comparison tests (t-tests) were performed to compare participants' responses in the pre-program and post-program surveys. T-tests were statistically significant at *p<0.05; **p<0.01; ***p<0.001

Table 53 Responses to behavioural norms

		HEC ONLY			ES ONLY			HEC & ES			HEC COMPARISON			ES COMPARISON			ES INFORMATION			HEC& ES INFORMATION		
	PROGRAM SURVEY	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD
Most of my family and friends do make an effort to save energy	PRE	521	3.50	0.79	116	3.53	0.78	48	3.48	0.95	196	3.56	0.63	231	3.45	0.96	31	3.58	0.96	242	3.55	0.77
	POST	521	3.53	0.70	116	3.55	0.88	48	3.40	0.76	196	3.66	0.60	231	3.47	0.96	31	3.48	1.18	242	3.62	0.79
Other members in my household are not very interested in saving energy	PRE	521	2.67	0.69	95	2.63	1.10	35	2.77	1.11	196	**2.94**	0.82	191	2.46	1.01	28	2.75	0.84	241	2.60	0.81
	POST	521	2.63	0.65	95	2.45	1.15	35	2.49	0.78	196	**2.68*** **	0.63	191	2.39	1.12	28	2.93	1.30	241	2.68	0.75
Most of my family and friends would encourage me to save energy	PRE	521	3.46	0.80	120	3.43	0.96	49	3.43	0.91	196	3.48	0.75	231	**3.22**	0.96	31	3.42	1.12	242	3.42	0.89
	POST	521	3.45	0.77	120	3.38	1.02	49	3.29	0.91	196	3.58	0.73	231	**3.42****	0.97	31	3.61	0.99	242	3.43	0.81

N = total number of responses for each question, M = mean, SD = Standard Deviation. Participants were asked to provide a response on a five point Likert scale: 1= Strongly Disagree, 2= Disagree, 3= Neither Disagree nor Agree/Do not know, 4= Agree, and 5= Strongly Agree. Mean comparison tests (t-tests) were performed to compare participants' responses in the pre-program and post-program surveys. T-tests were statistically significant at *p<0.05; **p<0.01; ***p<0.001

Table 54 Responses to statements on wastage

		HEC ONLY			ES ONLY			HEC & ES			HEC COMPARISON			ES COMPARISON			ES INFORMATION			HEC& ES INFORMATION		
	PROGRAM SURVEY	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD
I do feel regretful if I waste things	PRE	521	**3.92**	0.69	123	4.11	0.90	49	**4.16**	0.92	196	3.78	0.66	234	**3.90**	1.04	32	3.97	1.09	242	**3.76**	0.80
	POST	521	**3.78*** **	0.61	123	3.97	1.10	49	**3.78***	0.13	196	3.85	0.48	234	**4.09***	0.94	32	3.91	1.23	242	**3.93****	0.05
I do not think that wasting things is bad	PRE	521	**2.09**	0.64	120	1.88	1.12	47	2.09	1.35	196	2.13	0.60	232	1.84	1.10	32	2.16	1.55	242	2.05	0.64
	POST	521	**2.03***	0.45	120	1.98	1.21	47	2.02	0.94	196	2.19	0.56	232	1.71	1.04	32	2.00	1.30	242	2.10	0.79
I feel the need to constantly buy new things	PRE	521	2.02	0.49	123	1.80	0.95	48	1.75	0.93	196	2.03	0.47	233	1.76	0.81	32	1.91	1.00	242	**1.99**	0.48
	POST	521	1.99	0.41	123	1.77	0.98	48	1.85	0.74	196	2.05	0.33	233	1.66	0.83	32	1.91	1.12	242	**1.80*****	0.68

N = total number of responses for each question, M = mean, SD = Standard Deviation. Participants were asked to provide their response on a five point Likert scale: 1= Strongly Disagree, 2= Disagree, 3= Neither Disagree nor Agree/Do not know, 4= Agree, and 5= Strongly Agree. Do not know responses were recoded as 3=Neither Disagree nor Agree. Mean comparison tests (t-tests) were performed to compare participants' responses in the pre-program and post-program surveys. T-tests were statistically significant at *p<0.05; **p<0.01; ***p<0.001

Table 55 Responses to statements on standard of living

		HEC ONLY			ES ONLY			HEC & ES			HEC COMPARISON			ES COMPARISON			ES INFORMATION			HEC& ES INFORMATION		
	PROGRAM SURVEY	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD	N	M	SD
You struggled to meet your financial commitments	PRE	521	**1.77**	1.05	121	1.88	0.97	47	**1.96**	1.20	196	1.57	1.03	232	1.75	0.96	31	1.94	1.03	242	**1.79**	1.07
	POST	521	**1.49*** **	0.87	121	1.74	0.89	47	**1.36*** **	0.92	196	1.47	0.80	232	1.85	1.01	31	1.84	1.13	242	**1.58** **	0.94
You had some money left over after paying regular bills to buy something you considered a treat	PRE	521	**3.20**	1.07	119	3.11	1.06	48	3.06	1.00	196	3.97	1.21	231	3.24	1.09	32	2.84	1.11	242	**2.96**	1.12
	POST	521	**3.36** **	1.15	119	3.10	1.04	48	3.27	1.45	196	3.81	0.82	231	3.14	1.08	32	3.09	1.20	242	**2.56*** **	1.01
You could not afford to heat or cool your home to keep yourself /others in the household comfortable	PRE	521	**1.51**	0.88	118	**1.92**	1.09	48	**1.96**	1.05	196	**1.87**	1.16	231	1.71	1.00	31	1.68	1.01	242	**1.51**	1.04
	POST	521	**1.27*** **	0.64	118	**1.66***	1.04	48	**1.25*** **	0.84	196	**1.60** **	0.84	231	1.72	1.03	31	1.81	1.33	242	**1.19*** **	0.63

N = total number of responses for each question, M = mean, SD = Standard Deviation. Participants were asked to provide a response on a five point Likert scale: 5-point scale; 1= Never, 2= Rarely, 3= Sometimes, 4= Often and 5= Always. Mean comparison tests (t-tests) were performed to compare participants' responses in the pre-program and post-program surveys. T-tests were statistically significant at *p<0.05; **p<0.01; ***p<0.001

A.5 Home Energy Check data

Table 56 Number of participants who received modification and/or appliance upgrade

	APPLIANCE UPGRADE ONLY		MODIFICATION ONLY		APPLIANCE & MODIFICATION		NO MODIFICATIONS OR APPLIANCE RECEIVED	
	N	%	N	%	N	%	N	%
HEC Only (n=600)	51	8.5	183	30.5	333	55.5	33	5.5
HEC & ES (n=60)	8	13.3	13	21.7	34	56.7	5	8.3
HEC & ES Information (n=286)	31	10.8	81	28.3	150	52.4	24	8.4
HEC Pilot (n=54)	11	20.4	19	35.2	10	18.5	14	25.9
Total (n=1000)	101	10.1	296	29.6	527	52.7	76	7.6

Table 57 Number of appliances upgrade recommended and installed

		FRIDGE		WASHING MACHINE		AIR-CONDITIONER		AT LEAST ONE APPLIANCE	
		N	%	N	%	N	%	N	%
HEC Only (n=600)	Recommended	320	53.3	168	28.0	1	0.2	468	78
	Installed	214	35.7	169	28.2	1	0.2	384	64
HEC & ES (n=60)	Recommended	38	63.3	30	50.0	0	0.0	50	83.3
	Installed	27	45.0	15	25.0	0	0.0	42	70.0
HEC & ES Information (n=286)	Recommended	166	58.0	156	54.5	1	0.3	229	80.1
	Installed	108	37.8	72	25.2	1	0.3	181	63.3
HEC Pilot (n=54)	Recommended	27	50.0	22	40.7	0	0.0	36	66.7
	Installed	11	20.4	10	18.5	0	0.0	21	38.9
Total (n=1000)	Recommended	551	55.1	376	37.6	2	0.2	783	78.3
	Installed	360	36.0	266	26.6	2	0.2	628	62.8

Note: During the Home Energy Check, participants might have been recommended more than one appliance. However, the program only allowed for one appliance upgrade. The last table column ("At least one appliance") refers to number of participants who had at least one appliance recommended to them.

Table 58 Number of modifications recommended and installed (excludes water related modifications)

		CEILING FANS (1-3 UNITS)		DRAFT SEAL TAPE (WINDOW OR DOOR)		POWER CONTROLLER (1-5 UNITS)		CFL (1-20 UNITS)		LED (1-9 UNITS)		AT LEAST ONE MODIFICATION	
		N	%	N	%	N	%	N	%	N	%	N	%
HEC Only (n=600)	Recommended	211	35.2	135	22.5	376	62.7	227	37.8	67	11.2	497	83
	Installed	236	39.3	112	18.7	286	47.7	268	44.7	30	5.0	502	84
HEC & ES (n=60)	Recommended	16	26.7	9	15.0	26	43.3	14	23.3	8	13.3	39	65.0
	Installed	24	40.0	8	13.3	18	30.0	28	46.7	0	0.0	47	78.3
HEC & ES Information (n=286)	Recommended	67	23.4	33	11.5	193	67.5	103	36.0	40	14.0	243	85.0
	Installed	66	23.1	18	6.3	165	57.7	87	30.4	23	8.0	227	79.4
HEC Pilot (n=54)	Recommended	18	33.3	14	25.9	21	38.9	0	0.0	0	0.0	34	63.0
	Installed	7	13.0	1	1.9	14	25.9	29	53.7	3	5.6	29	53.7
Total (n=1000)	Recommended	312	31.2	191	19.1	616	61.6	344	34.4	115	11.5	813	81.3
	Installed	333	33.3	139	13.9	483	48.3	412	41.2	56	5.6	805	80.5

Table 59 Number of water related modification recommended and installed

		HOT WATER TARIFF		TAP AERATOR (1-5 UNITS)		SHOWERHEADS (1-2 UNITS)		AT LEAST ONE MODIFICATION	
		N	%	N	%	N	%	N	%
HEC Only (n=600)	Recommended	58	9.7	60	10.0	155	25.8	225	38
	Installed	18	3.0	20	3.3	146	24.3	165	28
HEC & ES (n=60)	Recommended	0	0.0	9	15.0	5	8.3	18	30.0
	Installed	0	0.0	1	1.7	2	3.3	5	8.3
HEC & ES Information (n=286)	Recommended	30	10.5	23	8.0	48	16.8	96	33.6
	Installed	4	1.4	2	0.7	45	15.7	51	17.8
HEC Pilot (n=54)	Recommended	2	3.7	14	25.9	42	77.8	44	81.5
	Installed	2	3.7	1	1.9	5	9.3	5	9.3
Total (n=1000)	Recommended	90	9.0	106	10.6	250	25.0	383	38.3
	Installed	24	2.4	24	2.4	198	19.8	226	22.6

Table 60 Average combined cost of modifications and appliance upgrade received by households (participant contribution of $125 included)

	OBS	MEAN	SD	MIN	MAX
APPLIANCE UPGRADE ONLY					
HEC Only (n=600)	51	$627	$134	$420	$1,290
HEC & ES (n=60)	8	$610	$78	$535	$798
HEC & ES Information (n=286)	31	$625	$120	$420	$798
HEC Pilot (n=54)	11	$666	$155	$377	$826
Total	**101**	**$629**	**$128**	**$377**	**$1,290**
MODIFICATIONS ONLY					
HEC Only (n=600)	183	$311	$239	$15	$888
HEC & ES (n=60)	13	$309	$181	$90	$628
HEC & ES Information (n=286)	81	$229	$149	$73	$613
HEC Pilot (n=54)	19	$271	$182	$70	$682
Total	**296**	**$286**	**$214**	**$15**	**$888**
APPLIANCE UPGRADE AND MODIFICATIONS					
HEC Only (n=600)	333	$1,020	$266	$493	$1,592
HEC & ES (n=60)	34	$1,030	$224	$625	$1,426
HEC & ES Information (n=286)	150	$922	$195	$560	$1,460
HEC Pilot (n=54)	10	$811	$241	$534	$1,219
Total	**527**	**$988**	**$249**	**$493**	**$1,592**
ALL HEC PARTICIPANTS					
HEC Only (n=600)	567	$756	$409	$15	$1,592
HEC & ES (n=60)	55	$799	$368	$90	$1,426
HEC & ES Information (n=286)	262	$672	$357	$73	$1,460
HEC Pilot (n=54)	40	$515	$304	$70	$1,219
Total	**924**	**$724**	**$393**	**$15**	**$1,592**

Table 61 Average combined cost of modifications and appliance upgrade paid with program funds (participant contribution not included)

	OBS	MEAN	SD	MIN	MAX
APPLIANCE UPGRADE ONLY					
HEC Only (n=600)	51	$502	$134	$295	$1,165
HEC & ES (n=60)	8	$485	$78	$410	$673
HEC & ES Information (n=286)	31	$500	$120	$295	$673
HEC Pilot (n=54)	11	$541	$155	$252	$701
Total	**101**	**$504**	**$128**	**$252**	**$1,165**
MODIFICATIONS ONLY					
HEC Only (n=600)	183	$311	$239	$15	$888
HEC & ES (n=60)	13	$309	$181	$90	$628
HEC & ES Information (n=286)	81	$229	$149	$73	$613
HEC Pilot (n=54)	19	$271	$182	$70	$682
Total	**296**	**$286**	**$214**	**$15**	**$888**
APPLIANCE UPGRADE AND MODIFICATIONS					
HEC Only (n=600)	333	$895	$266	$368	$1,467
HEC & ES (n=60)	34	$905	$224	$500	$1,301
HEC & ES Information (n=286)	150	$797	$195	$435	$1,335
HEC Pilot (n=54)	10	$686	$241	$409	$1,094
Total	**527**	**$863**	**$249**	**$368**	**$1,467**
ALL HEC PARTICIPANTS					
HEC Only (n=600)	567	$671	$368	$15	$1,467
HEC & ES (n=60)	55	$703	$330	$90	$1,301
HEC & ES Information (n=286)	262	$586	$310	$73	$1,335
HEC Pilot (n=54)	40	$449	$259	$70	$1,094
Total	**924**	**$639**	**$350**	**$15**	**$1,467**

A.6 Energy consumption data

Table 62 Indicators of household energy consumption at the start of the program

	REGRESSION MODEL
Participant age	-12.21*(4.91)
Age of home	33.37(18.24)
Number of bedrooms in home	223.67***(48.29)
Number of people living in household	447.91***(52.93)
Household gross income	46.70*(19.17)
Household uses gas (mains or bottled)	-536.47***(77.23)
Household uses air-conditioner	203.07*(86.32)
Attitudes towards energy efficiency (pre-survey)	3.19(10.65)
Self-report level of control over energy bills	-102.14**(31.85)
Self-report level of comfort without heating or cooling appliances	-62.05*(27.31)
Level of self-rated energy efficiency	-211.25***(42.26)
_cons	2421.98***(497.24)
N	746
F-value	30.23
R^2	0.29
Adj. R^2	0.28

Standard errors in parentheses. Statistically significant at* p<0.05; ** p<0.01; *** p<0.001

Table 63 Comparison of energy consumption before and after activity (six-month period)

	CONSUMPTION PERIOD	N	MEAN	STD. ERR.	STD. DEV.	T-TEST	
HEC Only**	Oct 13 to Mar 14	586	1995.39	42.65	1032.42	t =	2.74
	Oct 14 to Mar 15	586	1940.79	42.87	1037.88	p-value	0.01
	Difference	586	54.60	19.97	483.31		
ES Only	Oct 13 to Mar 14	140	2069.39	96.65	1143.57	t =	-1.12
	Oct 14 to Mar 15	140	2110.01	101.44	1200.30	p-value	0.26
	Difference	140	-40.62	36.24	428.80		
HEC & ES	Oct 13 to Mar 14	45	1866.44	119.70	802.96	t =	-0.20
	Oct 14 to Mar 15	45	1877.14	117.26	786.58	p-value	0.84
	Difference	45	-10.69	52.51	352.27		
HEC Comparison ***	Oct 13 to Mar 14	110	1692.15	81.46	854.36	t =	-3.52
	Oct 14 to Mar 15	110	1840.29	100.30	1051.93	p-value	0.001
	Difference	110	-148.14	42.06	441.11		
ES Comparison	Oct 13 to Mar 14	152	1974.57	85.39	1052.74	t =	-0.07
	Oct 14 to Mar 15	152	1976.74	87.82	1082.66	p-value	0.95
	Difference	152	-2.17	32.33	398.60		
ES Information	Oct 13 to Mar 14	16	1897.94	272.68	1090.74	t =	-0.54
	Oct 14 to Mar 15	16	1951.38	347.32	1389.28	p-value	0.60
	Difference	16	-53.44	99.02	396.07		
HEC & ES Information**	Oct 13 to Mar 14	73	2004.82	204.70	1748.97	t =	2.65
	Oct 14 to Mar 15	73	1888.64	178.84	1528.04	p-value	0.01
	Difference	73	116.19	43.85	374.62		

Statistically significant at ** p<0.01 and ***p<0.001.

Table 64 Impact of modifications and/or appliances upgrade on energy consumption

	(1) HEC ONLY	(4) ALL PARTICIPANTS WHO RECEIVED A HEC	NUMBER OF PARTICIPANTS WHO RECEIVED PRODUCT (COMBINED SAMPLE)
Draft-proofing windows or doors	-14.14(13.44)	-14.37(12.73)	139
Ceiling fans	42.80(23.98)	36.66(21.40)	333
LED lighting	8.91(17.33)	10.38(15.42)	56
CFL lighting	-16.73**(5.78)	-13.97**(5.26)	408
Standby power controller	14.20(22.33)	11.05(20.28)	487
Refrigerator	-228.62***(46.39)	-210.62***(40.62)	360
Showerheads	-13.05(42.48)	-12.61(37.52)	198
Front-loading washing machine	37.77(78.65)	28.85(70.44)	55
Top-loading washing machine	-19.06(53.99)	-11.49(47.82)	211
_cons	36.47(42.56)	28.28(37.14)	
N	586	704	
F-value	4.82	5.12	
R2	0.07	0.06	
Adj. R2	0.06	0.05	

Standard errors in parentheses. Statistically significant at * p<0.05; ** p<0.01; *** p<0.001
Sample sizes for Treatments HEC & ES; HEC & ES Information and HEC Pilot are too small for analysis
The following modifications were removed from analysis as they were received by less than 5% of combined sample: air-conditioner (n=2); hot water tariff change (n=24); tap aerator (n=24).

Table 65 Overall impact on changes in energy consumption (October to March 2014 period)

	REGRESSION MODEL
Participants' age	1.09(-2.34)
Number of bedrooms in home	-14.55(-22.57)
Number of people living in household	58.11*(-24.97)
Household gross income	6.7(-9.21)
Household uses gas (mains or bottled)	52.06(-36.21)
Household uses air-conditioner	106.53**(-39.82)
Received a Home Energy Check	26.63(-44.86)
Number of ES sessions attended	17(-15.05)
Level of self-rated energy efficiency	-3.43(-19.95)
Self-report level of control over energy bills	26.67(-14.83)
Self-report level of comfort without heating or cooling appliances	-33.01**(-12.42)
Installed CFL lighting	-15.85**(-6.02)
Installed refrigerator	-207.07***(-41.43)
_cons	-227.61(-226.92)
N	776
F-value	5.72
R^2	0.09
Adj. R^2	0.07

Standard errors in parentheses. Statistically significant at* p<0.05; ** p<0.01; *** p<0.001

Table 66 Estimated costs savings and emission reductions based on participants' electricity consumption

INTERVENTION	TYPE	STATISTICALLY SIGNIFICANT CHANGE	N	AVERAGE DIFFERENCE (6 MONTHS) (KWH)	AVERAGE ANNUAL COST DIFFERENCE	ANNUAL EMISSIONS DIFFERENCE (KG CO_2-E)
HEC Only	Refrigerator upgrade only***	Reduction	208	-196.38	- $115.48	- 318.14
	Total**	Reduction	586	-54.60	- $32.11	- 88.45
ES Only	Total	No change	140	40.62	+ $23.89	+ 65.80
HEC & ES	Total	No change	45	10.69	+ $6.29	+ 17.32
ES Comparison	Total	No change	152	2.17	+ $1.28	+ 3.52
HEC Comparison	Total***	Increase	110	148.14	+ $87.12	+ 239.99
ES Information	Total	No change	16	53.44	+ $31.43	+ 86.57
HEC & ES Information	Refrigerator upgrade only*	Reduction	29	-215.07	- $126.47	- 348.41
	Total **	Reduction	73	-116.19	- $68.33	- 188.23
All HEC treatments combined	Refrigerator upgrade only***	Reduction	258	-187.06	- $110.00	- 303.04
	Total **	Reduction	704	-56.82	- $33.41	- 92.05

Based on t-test comparisons of participants electricity consumption before and after GHW interventions for a six-month period (October 2013 to March 2014 and October 2014 to March 2015
)Statistically significant at * p<.05; ** p<.01; *** p<.001

Table 67 Household electricity consumption (average daily consumption in kWh) before and after program intervention: HEC Only treatment

HEC ONLY	POWER AND LIGHTING (NETWORK CODE 11, 12, 13, 14)					WATER HEATING (NETWORK CODE 41, 42, 43, 44, 45)					TOTAL CONSUMPTION (ALL CODES)				
	N	MEAN	SD	T-TEST		N	MEAN	SD	T-TEST		N	MEAN	SD	T-TEST	
Oct-13	587	7.50	4.29	t =	2.29	403	4.16	1.96	t =	1.826	587	10.37	5.11	t =	2.486
Oct-14	587	7.28	4.48	p-value	0.022	403	4.03	1.74	p-value	0.069	587	10.09	5.29	p-value	0.013
Difference	587	0.23	2.38			403	0.12	1.37			587	0.28	2.70		
Nov-13	590	7.81	4.44	t =	0.73	402	4.00	2.96	t =	2.096	590	10.55	5.55	t =	1.653
Nov-14	590	7.74	4.83	p-value	0.468	402	3.73	1.62	p-value	0.037	590	10.32	5.51	p-value	0.099
Difference	590	0.07	2.49			402	0.27	2.62			590	0.23	3.38		
Dec-13	590	8.41	5.03	t =	0.29	404	3.81	2.96	t =	2.554	590	11.03	5.99	t =	1.548
Dec-14	590	8.38	5.48	p-value	0.771	404	3.47	1.59	p-value	0.011	590	10.80	6.11	p-value	0.122
Difference	590	0.03	2.78			404	0.33	2.64			590	0.23	3.65		
Jan-14	590	8.85	5.47	t =	1.42	403	3.72	3.22	t =	2.509	590	11.40	6.43	t =	2.447
Jan-15	590	8.69	5.73	p-value	0.156	403	3.35	1.56	p-value	0.013	590	11.02	6.31	p-value	0.015
Difference	590	0.16	2.76			403	0.37	2.94			590	0.38	3.79		
Feb-14	590	8.77	5.41	t =	2.61	404	3.67	2.25	t =	4.209	590	11.30	6.09	t =	3.429
Feb-15	590	8.50	5.54	p-value	0.009	404	3.44	2.17	p-value	0.000	590	10.90	6.26	p-value	0.001
Difference	590	0.28	2.58			404	0.23	1.08			590	0.40	2.85		
Mar-14	587	8.33	4.95	t =	3.01	408	3.74	2.26	t =	3.644	587	10.94	5.67	t =	3.562
Mar-15	587	8.07	4.91	p-value	0.003	408	3.58	2.26	p-value	0.000	587	10.61	5.74	p-value	0.000
Difference	587	0.26	2.07			408	0.15	0.84			587	0.33	2.25		

N= number of participants; MEAN= Average daily consumption (kWh) during the month; SD=standard deviation

Table 68 Household electricity consumption (average daily consumption in kWh) before and after program intervention: ES Only treatment

ES ONLY	POWER AND LIGHTING (NETWORK CODE 11, 12, 13, 14)					WATER HEATING (NETWORK CODE 41, 42, 43, 44, 45)					TOTAL CONSUMPTION (ALL CODES)				
	N	MEAN	SD	T-TEST		N	MEAN	SD	T-TEST		N	MEAN	SD	T-TEST	
Oct-13	142	8.02	5.28	t =	-0.54	84	4.25	2.12	t =	-1.10	142	10.56	5.88	t =	-0.88
Oct-14	142	8.13	5.15	p-value	0.59	84	4.43	2.29	p-value	0.28	142	10.76	5.91	p-value	0.38
Difference	142	-0.11	2.35			84	-0.18	1.51			142	-0.21	2.80		
Nov-13	142	8.62	6.13	t =	-1.88	84	4.03	2.16	t =	0.48	142	11.03	6.54	t =	-1.4
Nov-14	142	9.00	6.21	p-value	0.06	84	3.96	2.14	p-value	0.63	142	11.36	6.73	p-value	0.17
Difference	142	-0.38	2.41			84	0.07	1.35			142	-0.33	2.82		
Dec-13	142	9.37	6.53	t =	-1.58	85	3.95	2.38	t =	1.59	142	11.75	6.85	t =	-0.8
Dec-14	142	9.71	6.60	p-value	0.12	85	3.71	2.09	p-value	0.12	142	11.94	7.06	p-value	0.43
Difference	142	-0.33	2.52			85	0.24	1.42			142	-0.19	2.94		
Jan-14	144	9.56	6.41	t =	-1.60	87	3.85	2.39	t =	1.43	144	11.89	6.68	t =	-0.9
Jan-15	144	9.90	6.61	p-value	0.11	87	3.64	2.06	p-value	0.16	144	12.11	7.03	p-value	0.38
Difference	144	-0.34	2.57			87	0.22	1.42			144	-0.22	3.02		
Feb-14	144	9.26	6.04	t =	-1.27	88	3.79	2.35	t =	1.13	144	11.58	6.32	t =	-0.6
Feb-15	144	9.49	6.25	p-value	0.21	88	3.63	2.04	p-value	0.26	144	11.71	6.78	p-value	0.55
Difference	144	-0.22	2.12			88	0.16	1.32			144	-0.13	2.57		
Mar-14	142	8.75	5.68	t =	-2.35	86	3.89	2.14	t =	1.02	142	11.11	5.97	t =	-1.58
Mar-15	142	9.11	5.96	p-value	0.02	86	3.77	2.02	p-value	0.31	142	11.40	6.55	p-value	0.12
Difference	142	-0.36	1.82			86	0.12	1.09			142	-0.29	2.17		

N= number of participants; MEAN= Average daily consumption (kWh) during the month; SD=standard deviation

Table 69 Household electricity consumption (average daily consumption in kWh) before and after program intervention: HEC & ES treatment

HEC& ES	POWER AND LIGHTING (NETWORK CODE 11, 12, 13, 14)					WATER HEATING (NETWORK CODE 41, 42, 43, 44, 45)					TOTAL CONSUMPTION (ALL CODES)				
	N	MEAN	SD	T-TEST		N	MEAN	SD	T-TEST		N	MEAN	SD	T-TEST	
Oct-13	46	7.66	3.62	t =	0.12	28	3.50	1.18	t =	-0.44	46	9.79	4.13	t =	-0.37
Oct-14	46	7.62	3.33	p-value	0.91	28	3.56	1.34	p-value	0.67	46	9.91	3.98	p-value	0.71
Difference	46	0.04	2.17			28	-0.06	0.77			46	-0.12	2.27		
Nov-13	46	7.93	3.70	t =	-0.30	27	3.32	1.01	t =	0.58	46	9.88	4.23	t =	-0.53
Nov-14	46	8.04	3.47	p-value	0.77	27	3.26	1.01	p-value	0.57	46	10.07	4.10	p-value	0.60
Difference	46	-0.11	2.41			27	0.06	0.56			46	-0.19	2.40		
Dec-13	49	8.05	3.75	t =	-0.90	28	3.27	0.95	t =	1.89	49	9.92	4.38	t =	-0.84
Dec-14	49	8.37	3.78	p-value	0.373	28	3.07	0.82	p-value	0.07	49	10.20	4.29	p-value	0.40
Difference	49	-0.32	2.46			28	0.20	0.57			49	-0.28	2.33		
Jan-14	49	8.61	4.19	t =	0.04	29	3.06	1.08	t =	1.99	49	10.42	4.73	t =	0.21
Jan-15	49	8.60	4.21	p-value	0.971	29	2.83	0.92	p-value	0.06	49	10.35	4.58	p-value	0.84
Difference	49	0.01	2.47			29	0.23	0.63			49	0.07	2.34		
Feb-14	49	8.75	4.26	t =	0.45	29	3.06	1.10	t =	2.06	49	10.56	4.74	t =	0.70
Feb-15	49	8.61	4.27	p-value	0.656	29	2.82	0.91	p-value	0.05	49	10.36	4.63	p-value	0.49
Difference	49	0.14	2.20			29	0.23	0.61			49	0.20	1.98		
Mar-14	47	8.81	4.19	t =	0.93	28	3.21	1.21	t =	2.07	47	10.72	4.64	t =	1.19
Mar-15	47	8.51	4.06	p-value	0.357	28	3.02	1.11	p-value	0.05	47	10.39	4.51	p-value	0.24
Difference	47	0.30	2.19			28	0.20	0.50			47	0.33	1.90		

N= number of participants; MEAN= Average daily consumption (kWh) during the month; SD=standard deviation

Table 70 Household electricity consumption (average daily consumption in kWh) before and after program intervention: HEC Comparison

HEC COMPARISON	POWER AND LIGHTING (NETWORK CODE 11, 12, 13, 14)					WATER HEATING (NETWORK CODE 41, 42, 43, 44, 45)					TOTAL CONSUMPTION (ALL CODES)				
	N	MEAN	SD	T-TEST		N	MEAN	SD	T-TEST		N	MEAN	SD	T-TEST	
Oct-13	30	6.36	2.83	t =	-1.58	21	4.36	2.49	t =	-0.31	30	9.41	4.90	t =	-1.38
Oct-14	30	6.95	4.07	p-value	0.12	21	4.46	3.28	p-value	0.76	30	10.07	6.42	p-value	0.18
Difference	30	-0.59	2.03			21	-0.10	1.53			30	-0.66	2.61		
Nov-13	111	6.55	3.61	t =	-4.25	82	3.49	1.54	t =	-0.42	111	9.13	4.40	t =	-3.95
Nov-14	111	7.39	4.77	p-value	0.00	82	3.53	1.77	p-value	0.67	111	10.03	5.66	p-value	0.00
Difference	111	-0.84	2.09			82	-0.04	0.83			111	-0.90	2.41		
Dec-13	199	7.42	4.07	t =	-4.39	143	3.44	1.74	t =	2.36	199	9.89	4.90	t =	-3.35
Dec-14	199	8.09	4.69	p-value	0.00	143	3.28	1.75	p-value	2.36	199	10.46	5.43	p-value	0.00
Difference	199	-0.67	2.16			143	0.16	0.81			199	-0.57	2.41		
Jan-14	199	7.56	4.18	t =	-3.77	144	3.34	1.77	t =	2.58	199	9.98	5.04	t =	-2.88
Jan-15	199	8.27	4.96	p-value	0.00	144	3.16	1.66	p-value	0.01	199	10.57	5.67	p-value	0.00
Difference	199	-0.71	2.64			144	0.18	0.83			199	-0.59	2.91		
Feb-14	198	7.43	4.13	t =	-3.03	144	3.35	1.76	t =	2.49	198	9.87	4.98	t =	-2.28
Feb-15	198	8.07	5.14	p-value	0.00	144	3.17	1.51	p-value	0.01	198	10.40	5.77	p-value	0.02
Difference	198	-0.64	3.00			144	0.18	0.86			198	-0.54	3.31		
Mar-14	197	7.17	3.76	t =	-2.86	143	3.47	1.75	t =	1.91	197	9.70	4.66	t =	-2.23
Mar-15	197	7.72	4.88	p-value	0.00	143	3.36	1.59	p-value	0.06	197	10.18	5.58	p-value	0.03
Difference	197	-0.56	2.73			143	0.11	0.72			197	-0.48	3.03		

N= number of participants; MEAN= Average daily consumption (kWh) during the month; SD=standard deviation

Table 71 Household electricity consumption (average daily consumption in kWh) before and after program intervention: ES Comparison

ES COMPARISON	POWER AND LIGHTING (NETWORK CODE 11, 12, 13, 14)					WATER HEATING (NETWORK CODE 41, 42, 43, 44, 45)					TOTAL CONSUMPTION (ALL CODES)				
	N	MEAN	SD	T-TEST		N	MEAN	SD	T-TEST		N	MEAN	SD	T-TEST	
Oct-13	66	7.89	4.40	t =	0.82	39	3.66	1.86	t =	0.84	66	10.06	5.33	t =	0.87
Oct-14	66	7.67	3.89	p-value	0.42	39	3.54	2.08	p-value	0.40	66	9.79	4.88	p-value	0.39
Difference	66	0.22	2.22			39	0.12	0.90			66	0.27	2.51		
Nov-13	153	8.12	4.86	t =	-0.86	100	3.76	1.92	t =	2.40	153	10.57	5.78	t =	-0.11
Nov-14	153	8.29	5.21	p-value	0.39	100	3.53	1.82	p-value	0.02	153	10.60	6.02	p-value	0.91
Difference	153	-0.17	2.45			100	0.22	0.92			153	-0.02	2.69		
Dec-13	191	8.67	5.21	t =	-1.45	125	3.72	1.87	t =	2.58	191	11.14	5.85	t =	-0.40
Dec-14	191	8.92	5.49	p-value	0.15	125	3.50	1.91	p-value	0.01	191	11.21	6.07	p-value	0.69
Difference	191	-0.25	2.36			125	0.22	0.94			191	-0.08	2.62		
Jan-14	228	9.37	5.88	t =	-2.46	147	3.71	2.26	t =	1.02	228	11.79	6.73	t =	-1.60
Jan-15	228	9.86	6.52	p-value	0.01	147	3.56	2.35	p-value	0.31	228	12.16	7.48	p-value	0.11
Difference	228	-0.49	3.02			147	0.15	1.79			228	-0.37	3.52		
Feb-14	227	9.22	5.70	t =	-1.92	148	3.71	2.26	t =	0.71	227	11.67	6.60	t =	-1.25
Feb-15	227	9.58	6.24	p-value	0.06	148	3.63	2.41	p-value	0.48	227	11.94	7.37	p-value	0.21
Difference	227	-0.36	2.79			148	0.09	1.46			227	-0.28	3.35		
Mar-14	224	8.78	5.22	t =	-1.68	147	3.88	2.33	t =	2.11	224	11.37	6.34	t =	-0.51
Mar-15	224	9.02	5.64	p-value	0.09	147	3.69	2.28	p-value	0.04	224	11.45	6.71	p-value	0.61
Difference	224	-0.24	2.14			147	0.19	1.11			224	-0.08	2.34		

N= number of participants; MEAN= Average daily consumption (kWh) during the month; SD=standard deviation

Table 72 Household electricity consumption (average daily consumption in kWh) before and after program intervention: HEC & ES Information

HEC & ES INFORMATION	POWER AND LIGHTING (NETWORK CODE 11, 12, 13, 14)					WATER HEATING (NETWORK CODE 41, 42, 43, 44, 45)					TOTAL CONSUMPTION (ALL CODES)				
	N	MEAN	SD	T-TEST		N	MEAN	SD	T-TEST		N	MEAN	SD	T-TEST	
Jan-14	269	8.33	6.98	t =	1.57	177	3.38	1.34	t =	3.09	269	10.55	7.31	t =	2.15
Jan-15	269	8.10	6.17	p-value	0.12	177	3.19	1.21	p-value	0.00	269	10.21	6.49	p-value	0.03
Difference	269	0.23	2.38			177	0.19	0.81			269	0.35	2.63		
Feb-14	268	8.34	6.90	t =	2.18	176	3.39	1.30	t =	2.24	268	10.57	7.22	t =	2.45
Feb-15	268	8.03	6.18	p-value	0.03	176	3.27	1.24	p-value	0.03	268	10.19	6.51	p-value	0.01
Difference	268	0.31	2.32			176	0.12	0.69			268	0.38	2.52		
Mar-14	254	7.81	5.96	t =	1.79	168	3.60	1.38	t =	2.11	255	10.16	6.34	t =	1.94
Mar-15	254	7.63	5.84	p-value	0.07	168	3.49	1.29	p-value	0.04	255	9.93	6.17	p-value	0.05
Difference	254	0.18	1.61			168	0.12	0.72			255	0.23	1.86		

N= number of participants; MEAN= Average daily consumption (kWh) during the month; SD=standard deviation

Table 73 Household average daily mains gas consumption before and after program intervention

	HEC ONLY					ES ONLY					HEC COMPARISON					ES COMPARISON					HEC & ES INFORMATION				
	N	MEAN	SD	T-TEST		N	MEAN	SD	T-TEST		N	MEAN	SD	T-TEST		N	MEAN	SD	T-TEST		N	MEAN	SD	T-TEST	
Oct-13	83	16.52	1.18	t =	0.27	28	20.39	2.75	t =	0.85	5	26.37	7.34	t =	-1.73	15	19.12	2.66	t =	1.79	n/a				
Oct-14	83	16.37	1.30	p-value	0.79	28	19.23	2.88	p-value	0.40	5	27.64	7.53	p-value	0.16	15	17.34	2.42	p-value	0.10	n/a				
Difference	83	-0.14	0.54			28	-1.16	1.37			5	1.27	0.73			15	-1.78	1.00			n/a				
Nov-13	84	15.10	1.08	t =	0.69	28	18.51	2.59	t =	0.80	9	16.65	5.15	t =	0.10	27	15.48	1.93	t =	-0.06	10	20.87	2.54	t =	1.54
Nov-14	84	14.76	1.18	p-value	0.49	28	17.40	2.79	p-value	0.43	9	16.59	5.11	p-value	0.92	27	15.55	1.90	p-value	0.95	10	20.19	2.42	p-value	0.16
Difference	84	-0.34	0.49			28	-1.11	1.39			9	-0.06	0.61			27	0.07	1.14			10	-0.68	0.44		
Dec-13	80	14.81	1.08	t =	0.32	26	16.37	2.32	t =	1.09	17	16.85	3.71	t =	2.00	27	15.05	1.88	t =	-0.09	41	13.93	1.38	t =	-0.22
Dec-14	80	14.64	1.22	p-value	0.75	26	15.19	2.49	p-value	0.29	17	13.74	3.06	p-value	0.06	27	15.16	1.89	p-value	0.93	41	14.04	1.46	p-value	0.83
Difference	80	-0.16	0.52			26	-1.18	1.09			17	-3.11	1.55			27	0.10	1.18			41	0.10	0.47		
Jan-14	61	14.57	1.23	t =	0.41	19	15.29	2.64	t =	0.58	17	16.79	3.73	t =	1.95	25	14.09	1.84	t =	-0.31	31	12.51	1.44	t =	0.35
Jan-15	61	14.37	1.31	p-value	0.68	19	14.57	3.05	p-value	0.57	17	13.74	3.06	p-value	0.07	25	14.48	1.84	p-value	0.76	31	12.40	1.37	p-value	0.73
Difference	61	-0.21	0.50			19	-0.72	1.25			17	-3.04	1.56			25	0.39	1.28			31	-0.10	0.30		
Feb-14	24	11.31	2.30	t =	1.03	8	14.89	3.38	t =	2.35	12	15.62	3.96	t =	1.49	12	12.97	2.78	t =	2.15	12	14.12	2.53	t =	1.80
Feb-15	24	10.95	2.37	p-value	0.32	8	12.74	2.81	p-value	0.05	12	14.54	3.68	p-value	0.16	12	11.24	2.46	p-value	0.05	12	12.91	2.20	p-value	0.10
Difference	24	-0.36	0.35			8	-2.15	0.91			12	-1.09	0.73			12	-1.73	0.81			12	-1.22	0.68		

N= number of participants; MEAN= Average daily consumption (MJ) during the month; SD=standard deviation

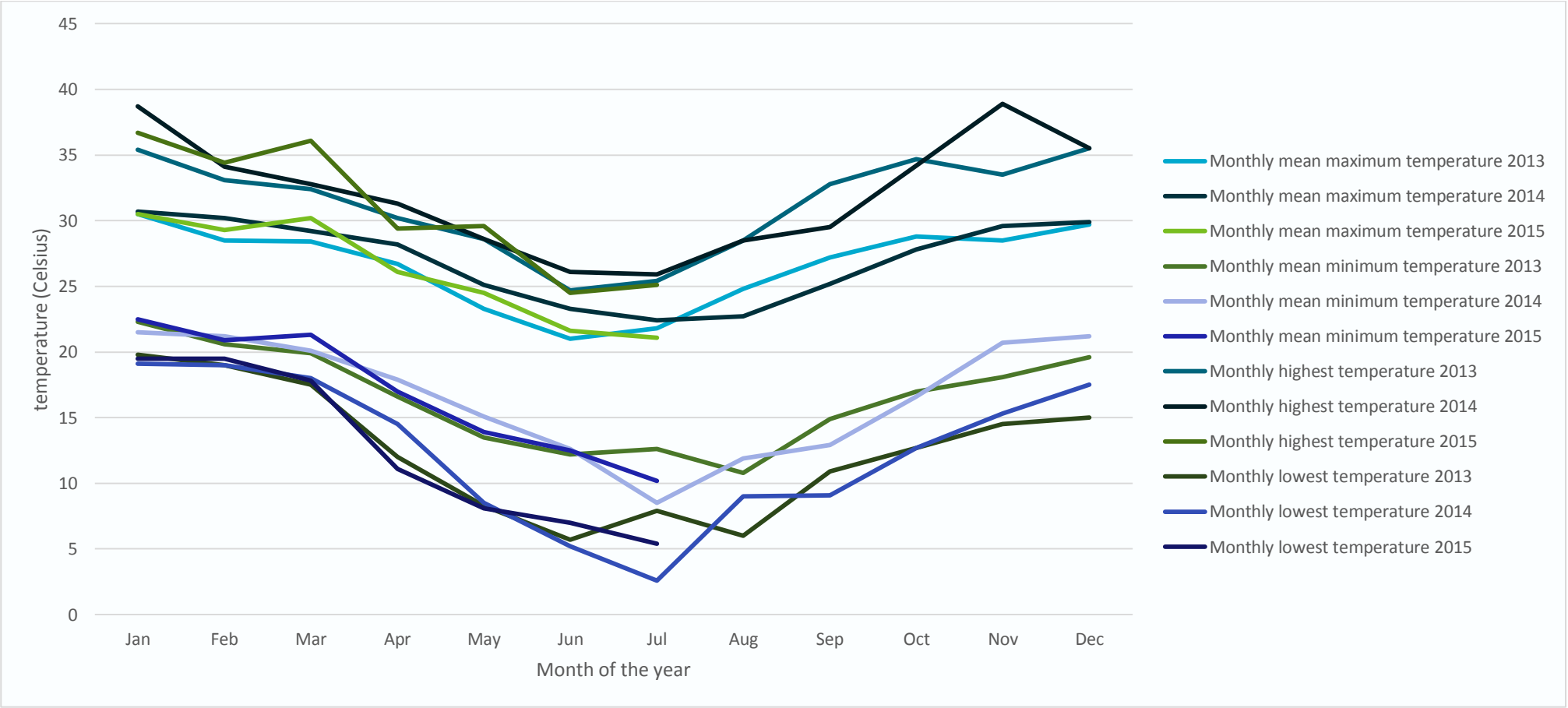

Figure 25 Brisbane minimum and maximum temperatures - 2013 to 2015[25]

[25] Source: Climate Data Online (http://www.bom.gov.au)

A.7 Electricity consumption costs and carbon emissions

Information about participants energy costs were not collected by the program. Therefore, for the purposes of program evaluation, the electricity consumption costs and carbon emissions were estimated based on the following information:

Electricity consumption costs

Starting from a kWh figure, it is possible to estimate the changes in electricity costs that resulted from the program. Electricity charges in SE Queensland comprise a services charge (which is fixed) and a consumption tariff, which imposes a charge per kWh of electricity consumed. The tariff is a regulated charge which is the same for the majority of residential consumers, and during the program had a value of 29.403 cents per kWh. This is the 'Tariff 11' standard rate for SE Qld for the 2013-14 year, obtained from https://www.dews.qld.gov.au/energy-water-home/electricity/prices/current-prices .

Further notes on the calculation of cost savings are below:

- The average annual cost difference figure in the table above is derived by multiplying the kWh savings (for a 6 month period) by 2 to reach an annualised consumption figure, then multiplying this by $0.29403.
- Some residential consumers may pay more or less than the regulated tariff, if they are on a specialised contract they have negotiated with their electricity retailer, which may include lower charges as part of an incentive program, or higher charges for participation in a renewable "green energy" program. Such differential costs are not incorporated in the above calculations.
- The presence of solar PV panels on any participant houses does not impinge on the calculations of cost savings or emissions, since grid-sourced consumption is accounted for and charged independently of any locally- generated power delivered into the grid. Only the addition of residential battery storage would have invalidated the data for any houses in which it occurred, and the probability of this impact is judged as negligible.
- Because the kWh figure is based on a comparison of 6 months of consumption data from the same period 12 months apart, there is no need to correct for seasonal differences – such differences are already controlled for because the same seasonal effects are present for both the pre- and post-program data.
- Because the 6-monthly period (May to October) that was used to assess change in consumption incorporated winter (when consumption tends to be lower) rather than summer (when consumption tends to be higher), the annualised difference figure is probably an underestimate of the actual differences.
- Note that over the same period as the interventions, the HEC Comparison group showed an average increase in consumption that corresponded to an annual cost increase of $87.12. Reductions in other groups need to be interpreted in relation to this figure, which represents an estimate of how average consumption could have been expected to change in the absence of the interventions.
- All cost/emission differences are averages – individual households within the program could (and would) have shown changes smaller or larger than the average figures shown in the table.

Carbon emissions

Through a similar process as that described above, the average annual carbon emissions changes implied by changes in electricity consumption can be calculated for the program. According to the most recently-available data, the consumption of grid-delivered electricity in Queensland has CO_2-equivalent emissions equal to 0.81 kg per kWh. Further notes on calculation of emissions are below:

- The average annual emissions difference figure in the table above is derived by multiplying the kWh savings (for a 6 month period) by 2 to reach an annualised figure, then multiplying this by 0.81 kg.
- The same issues/limitations noted above for calculation of cost savings also apply to these calculations.
- The figures reported are Scope 2 emissions for grid-purchased electricity only. They do not include Scope 3 (embodied) emissions, for example, from the manufacture of new appliances or disposal of old appliances that occurred as part of this program.
- Note that over the same period as the interventions, the HEC Comparison group showed an average increase in consumption that corresponded to an annual emission increase of 239.99 kg. Reductions in other groups need to be interpreted in relation to this figure, which represents an estimate of how average emissions could have been expected to change in the absence of the interventions.

A.8 Program feedback from participants

Table 74 Post-program surveys: qualitative questions

QUESTIONS
What are the 3 main changes in your (or your household's) energy use, if any, as a result of participating in the Green Heart Wisdom program? Please specify.
Were there any barriers to making changes in the way you use energy at home?
What was the most significant outcome for you from the program? Why?
Would you like to make any other comments on the Green Heart Wisdom program?

Table 75 Total participants interviewed for post-program evaluation

PARTICIPANTS INTERVIEWED	TOTAL PARTICIPANTS	N	PERCENTAGE
HEC Only	654	36	5.5
HEC & ES Information	286	16	5.6
HEC & ES	60	2	3.3
ES Only and ES Information	198	8	4.0
Total	**1198**	**62**	**5.2**

Table 76 Post-program interview questions

QUESTIONS
Questions for all respondents:
In general, how worthwhile did you find the Green Heart Wisdom program? Why?
What were the highlights of the program? Why?
Did you make some changes as a result of the program?
Have you maintained any of these changes since the end of the program (long term)? If yes, which ones? If no, which ones, and why?
What do you remember most from the program? Why?
Which organisations do you recall being involved in the program? Please list them by name.
Would you recommend the program to your friends or family? Why?
Questions for Home Energy Check recipients only:
At the first home visit, did you experience any difficulties completing the Pre-Program Survey or responding to questions regarding your home energy check? If yes, please describe.
How would you rate the level of service from the field officer who conducted your Home Energy Check? Why?
How would you rate the level of service from the tradespeople who installed energy efficiency modifications to your home? Why?
How would you rate your overall experience in receiving the Home Energy Check and any modifications or appliances? Why?
What could be improved about the Home Energy Check and any modifications or appliances?
Questions for EnergySavers recipients only:
How would you rate your EnergySavers convenor? Why?
What was your impression of the EnergySavers materials? Why?
Overall questions for all respondents:
Should this program be continued? Why?
Should this program be changed? How?
Do you have any suggestions for future energy saving programs that could be provided to you?
Final questions for all respondents:
In general, how worthwhile did you find the Green Heart Wisdom program? Why?
What were the highlights of the program? Why?
Did you make some changes as a result of the program?

A.9 LIEEP Data Portal submission

Table 77 Data submitted to LIEEP Data Portal - Brisbane City Council Repository

TABLES	PILOT DATA	MAIN STAGE DATA	DATA UPLOADED	DATE SUBMITTED	TABLE UPDATED
6.2. Appliance Detail	YES	YES	YES	2 April 2015	n/a
6.3 Attitudes To Energy Efficiency Survey	Not collected	YES	YES	2 April 2015	25 June 2015
6.4 Case Management Interaction	YES	YES	YES	2 April 2015	n/a
6.6 Dwelling Details	YES	YES	YES	2 April 2015	25 June 2015
6.7 Energy Efficiency Measure	YES	YES	YES	16 April 2015	25 June 2015
6.8 Energy Audit	YES	YES	YES	2 April 2015	25 June 2015
6.10 Funding Agreement Survey	Not collected	YES	YES	2 April 2015	25 June 2015
6.11 Grant Recipient Staff	YES	YES	YES	2 April 2015	n/a
6.12 Grant Recipient Details	YES	YES	YES	2 April 2015	n/a
6.14 Information Session	YES	YES	YES	2 April 2015	n/a
6.15 Insulation Details	YES	YES	YES	2 April 2015	n/a
6.16 Lighting	YES	YES	YES	2 April 2015	n/a
6.17 Meter to Tariff Details	YES	YES	YES	13 April 2015	n/a
6.18 Meter	YES	YES	YES	13 April 2015	n/a
6.19 Participant Details	YES	YES	YES	2 April 2015	n/a
6.21 Program Barrier	YES	YES	YES	2 April 2015	n/a
6.22 Program Details	YES	YES	YES	2 April 2015	n/a
6.25 Retrofit record	YES	YES	YES	16 April 2015	25 June 2015
6.26 Space cooling	YES	YES	YES	2 April 2015	n/a
6.27 Space heating	YES	YES	YES	2 April 2015	n/a
6.29 Treatment condition	YES	YES	YES	2 April 2015	n/a
6.30 Water heating	YES	YES	YES	2 April 2015	n/a
6.31 Workshop attendance	YES	YES	YES	2 April 2015	n/a
6.32 Community Workshop	YES	YES	YES	2 April 2015	n/a

Data submitted to the LIEEP data portal in accordance to the requirements of the LIEEP Data Schema v.1.3.1.
The following tables were not applicable to the GHW program: 6.5 Consultant Training Details; 6.9 Details concerning an external wall; 6.13 In-home display; 6.20 Photovoltaic Details; 6.23 Rebate record; 6.24 Recent modifications and 6.28 Tariff record.

Table 78 Data submitted to LIEEP Data Portal - Brisbane City Supplementary Data Repository

TABLES	PILOT DATA	MAIN STAGE DATA	DATA UPLOADED	DATE SUBMITTED	TABLE UPDATED
NMI data	YES	YES	YES	13 April 2015	25 June 2015
MIRN data	YES	YES	YES	13 April 2015	25 June 2015