GET BILL $MART.

EXECUTIVE SUMMARY

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Australian Government
Department of Industry, Innovation and Science

MISSION AUSTRALIA

SUSTAINABLE LIVING TASMANIA

UNIVERSITY of TASMANIA

Contents

2. Executive Summary

This activity received funding from the Australian Government. The views expressed herein are not necessarily the views of the Commonwealth of Australia, and the Commonwealth does not accept responsibility for any information or advice contained herein.

2.1 Purpose

This report provides a detailed account of the Get Bill Smart project which ran over the period 1 July 2013 to 15 March 2016 in Tasmania, Australia. Get Bill Smart (GBS) was an action research project that operated in the Greater Hobart area of Tasmania. It trialled an innovative community capacity building approach to low income energy efficiency and compared it to a more conventional, well-practiced in-home energy efficiency upgrade approach. GBS trialled approaches to energy efficiency as part of the Low Income Energy Efficiency Program (LIEEP). The LIEEP program primarily aimed to:

- Trial and evaluate a number of different approaches in various locations that assist low incomes households to be more energy efficient;
- To capture and analyses data and information to inform future energy policy and program approaches.

The LIEEP trial also aimed 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;
- Build the knowledge and capacity of consortia members to encourage long-term energy efficiency among their customers or clients, and;
- Build the capacity of Australian energy efficiency technology and equipment companies by maximising the opportunities for Australian Industries to participate in the projects.

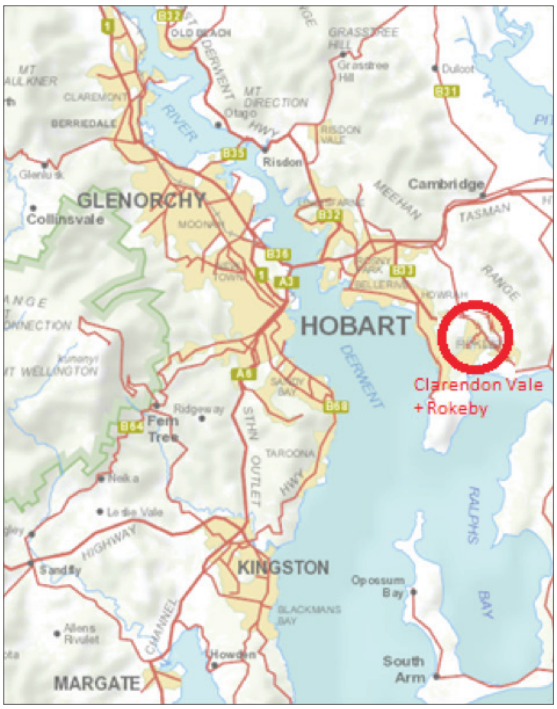
The Department of Industry, Innovation and Science provided funding under the Low Income Energy Efficiency Program (LIEEP). The LIEEP program included 20 projects around Australia all of which investigated and evaluated approaches to assist low-income households to be more energy efficient. The detailed findings from these 20 projects will inform future energy efficiency programs and policies.

This Final Report is the 9th milestone report for the GBS project. Submitted to LIEEP for review in March 2016, it was submitted as a final version in May 2016. Submission of this report denotes the end of the main delivery, monitoring and evaluation stages of the GBS project. In order to evaluate the trial approaches, Get Bill Smart collected qualitative and quantitative data using multi-method data collection and analysis techniques. This Final Report was developed from analysis of five sub-reports that describe the evaluation undertaken (Bulk Study, Detailed Study, Cost Benefit Analysis, Project Processes and Organisational Analysis, and Finance Report). This Final Report provides overview and background information to contextualise the four sub-reports and provides a summary of sub-reports, which are contained in the body of this document.

2.2 Focus

The GBS project operated in the Greater Hobart area of Tasmania, as indicated by the map in Figure 2-1. The community capacity building occurred in the suburbs of Clarendon Vale and Rokeby (CVR) (as circled on the map).

Figure 2–1 Greater Hobart area, population centres in brown (Clarendon vale and Rokeby in red)



2.3 Methods

The overall aim of the GBS project was to examine two approaches that were designed to improve energy efficiency in low income households;

- In-home education and upgrades (EDUG); and
- Community capacity-building (CCB).

Each approach was trialled alone and in combination with the other approach, which meant that three different energy efficiency approaches were trialled:

- In-home education and upgrades alone;
- Community capacity-building alone; and
- In-home education and upgrades plus community capacity-building together (EDUG + CCB).

All three approaches were compared against a representative group (REP).

Project Objectives

Overall objectives for GBS were to:

- Understand how a community capacity-building approach can assist low income households to reduce their energy consumption and how this approach compares with and interacts with more common in-home education and upgrade approaches.
- Understand the processes and key determinants for success, barriers, and drivers for each energy efficiency approach.
- Understand how benefits from thermal and energy efficiency improvements are utilised by low-income households in a cool temperate climate; whether households choose reduction of energy use or increased thermal comfort; and, the impacts of these improvements on health and wellbeing.
- Assist low-income households in Rokeby, Clarendon Vale and Southern Tasmania to be more energy efficient.
- Provide employment, training and commercial opportunities for local residents and businesses.

In-home education and upgrade (EDUG)

The in-home education and upgrade approach involved two qualified home energy assessors (Home Energy Helpers or HEH) visiting a household, educating the householder(s), and performing a series of energy efficiency upgrades. The education sessions included discussions about how the home performs, working through tailored booklet, and development of a plan to reduce energy usage. Energy efficiency upgrades were performed by a second HEH (or a subcontractor, and included some, or all, of the following (see Table 2-1, below).

Table 2-1 Energy efficiency upgrades delivered in the Get Bill Smart Project

Upgrade Description
Shower head replacement with equivalent 9L/min model
Hot water storage cylinder insulation with reflective sheeting with bubble-core interior
Hot water pressure relief valve and pipe insulation with ValveCosy (valvecosy.com.au) and foam pipe lagging respectively. Lagging applied to first 2 metres of outlet and pressure relief pipes only
Light globe replacement with high-quality, equivalent light output, warm white compact fluorescent lamps
Accessible power switch installation (EcoSwitch) on home entertainment and IT systems to reduce standby power consumption
Window, door, fan & vent draught-proofing in heated zones
Ceiling insulation to R4
Curtains (thermally lined with full block out) on a track system that acts as a pelmet (trapping air between curtain and window) in heated zones.
Underfloor insulation

Community Capacity Building (CCB)

The Get Bill Smart project implemented an innovative Community Capacity Building (CCB) to encourage community engagement, facilitate community-wide discussion about energy efficiency, and build the capacity of a community to improve their own energy efficiency.

Get Bill Smart took a strengths-based, participatory approach the Community Capacity Building approach. The strengths-based approach allowed a focus on positive capacity rather than problems. Working with community members (Community Energy Champions) a community engagement strategy was developed that played to the strengths and needs of the community. For example, rather than a negative focus on poor thermal performance due to house design and construction and limited finances, the project focussed on the community's pride in being resourceful and addressed the challenges specific to this community such as low income and cash flow. This focus utilised existing community resources including the neighbourhood centres, child and family centre, health centre, churches, schools, sports clubs and interest groups.

The capacity-building approach was participatory in terms of hiring community members to perform as much of the work as possible and involving them in developing the details and implementation of the community engagement activities. A key to this was recruiting as early as possible into the project 12 households to act as Community Energy Champions (EC). These people received the in-home education and upgrades explained above so they could experience the benefits of energy efficiency and some of the activities other participants would be receiving. The 12 ECs were trained in energy efficiency and communication and drove the focus of the energy efficiency activities and campaign.

The participatory nature of the GBS approach required the capacity building activities to be developed with the involvement of the community. Activities the ECs were involved with included:

- developing a focus for the GBS program in CVR
- recruiting people into the GBS study
- distributing the Stay Warm booklet to householders
- developing a calendar of community events
- hosting BBQs and information sessions at neighbourhood centres and the community shed
- staffing stalls at community events, the community centres and other public locations within the CVR area

- organising and running sewing workshops
- organising hardware shopping tours
- organising and staffing a quiz night
- door-knocking homes in the local area to raise awareness of the GBS project, support the research component of the project, and to engage with householders
- organising and running home energy efficiency parties (modelled on the Tupperware approach).

Allocation into approaches and research groups

Get Bill Smart was trialled in the Greater Hobart area, with the community of Clarendon Vale and Rokeby (CVR) providing the location of the CCB approach. The Greater Hobart (GH) approach occurred over the whole of the greater Hobart area. CCB was conducted by the 12 ECs and a Community Engagement Officer (EO) employed by the GBS project. The CCB approach occurred only in the communities of CVR for the participants.

The GBS project recruited 504 low income households (the aim was 480). In the first instance, depending on whether they lived within the CVR area, participants were randomly allocated to one of the four approach groups. As discussed in the Project Processes and Organisational Analysis (section 8.9.3) there were some significant challenges to recruitment. While all attempts were made to randomly allocate participants to approach groups at times this was a practical impossibility. Factors that affected random allocations included: landlord permissions in the EDUG groups (either the landlord refused upgrades or participants were unwilling to seek consent); participant requests for specific allocations (we conceded to these requests given the recruitment challenges faced).

One of the practical challenges to participant completion of the GBS project was the transient nature of many of the householders. As a result, different households participated in GBS to different degrees, meaning that completion numbers for different parts of the project vary.

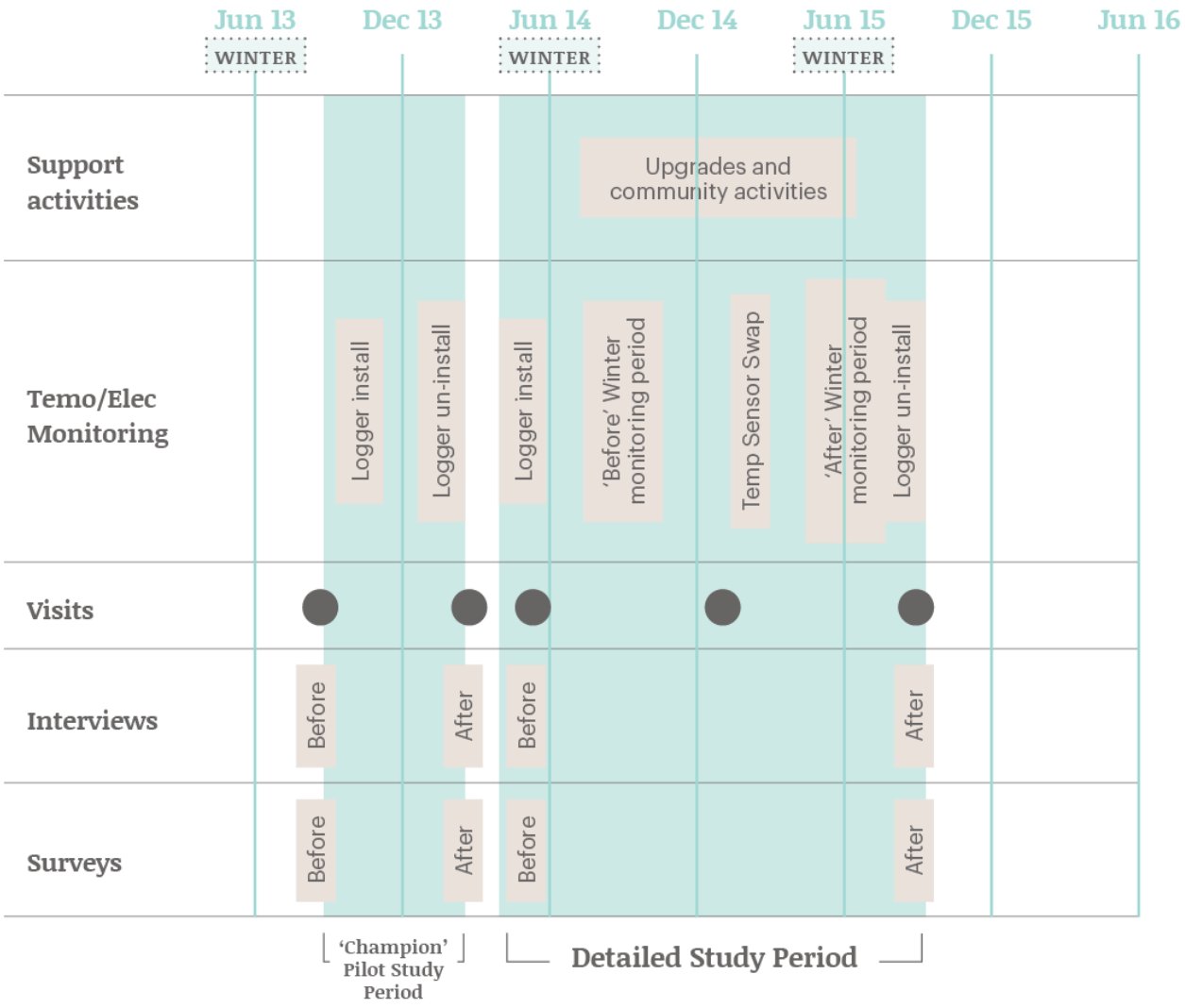
Overall GBS had 510 participants: 88 in EDUG + CCB, 169 in EDUG, 88 in CCB and 165 in REP.

GBS data collection and analysis

The project organised participants into a bulk and a detailed group so that trends and detailed information could be collected together. The bulk study (449 households) entailed 2 surveys and collection of energy billing data from energy suppliers (TasNetworks and Aurora Energy). The Detailed Study involved 51 households spread over the four approach groups and entailed being involved in further (more intensive) data collection in the form of in home energy and temperature monitoring and interviews. Participant's homes were monitored for a 12-15 month period between late 2013 and 2015. Twelve ECs also participated in the detailed style of research, but earlier than the other detailed participants.

Figure 2-2 provides an overview of the timing of the various research activities. The detailed data and analysis for each of these components of the GBS research can be found in the following reports: Bulk Study, Detailed Study, Cost Benefit Analyses, and Project Processes and Organisational Analysis.

Figure 2–2 Timing of research activities for the Get Bill Smart Project



The GBS data collection and analysis aimed to identify:

1 Before and after effects of approaches in terms of household energy use, comfort management, health, wellbeing, financial management and household conditions;

2 The processes, key determinants for success, barriers to, and drivers for each different approach;

3 Comparative effects of approaches against each other and a representative sample of households;

4 Cost benefit ratios of different approaches;

5 Thermal comfort and energy consumption related housing conditions participants live with;

6 Energy reduction outcomes from the different approaches (particular and trends);

7 More detailed understanding of the context of low income, disadvantaged householders in relation to energy efficiency and thermal comfort in the home;

8 More detailed understanding of working towards energy efficiency in Tasmanian contexts;

9 How energy efficiency gains from approaches are utilised by low income households in a cool temperate climate, especially in relation to thermal and physiological comfort; and

10 Successes, failures, drivers, barriers and capacity issues encountered by program stakeholders and organisations when implementing approaches.

2.4 Outcomes

The outcomes section of the executive summary has been structured according to the initial Get Bill Smart project objectives:

1 Understanding how different energy efficiency approaches can assist low income households to reduce their energy consumption,[1]

2 Understand the processes, key determinants for success, barriers, and drivers for each energy efficiency approach,

3 Understand how benefits from thermal and energy efficiency improvements are utilised by low-income households in a cool temperate climate; whether households choose reduction of energy use or increased thermal comfort; and, the impacts of these improvements on health and wellbeing,

4 Assist low-income households in Rokeby, Clarendon Vale and Greater Hobart to be more energy efficient,

5 Provide employment, training and commercial opportunities for local residents and businesses.

Understanding how different energy efficiency approaches can assist low income households to reduce their energy consumption

Energy consumption changes were calculated as changes in electricity usage over the project period. Figure 2-3 on page 23 shows the average and median changes of each GBS approaches. While the CCB approach was effective in delivering energy saving messages to vulnerable and socially isolated households, the EDUG approach was more effective in delivering actual energy and thermal comfort savings. Notably, when these two approaches were combined, EDUG + CCB, the energy and thermal comfort savings were increased.

Figure 2-3 Average and median change in electricity consumption

1 This objective has been reworded for clarity and to assist in structuring a response.

The cumulative energy and water savings from the project have been calculated (see Cost Benefit Analysis). Overall the EDUG+ CCB approach delivers $1596 of savings and the EDUG approach delivers $1400. However the cost-benefit analysis shows the EDUG approach delivering $1 of savings for an investment of $0.86 cents whereas the CCB+EDUG requires $1.32 (see Table 2-2, below).

Table 2-2 Cumulative energy and water savings and cost benefit

	Community Capacity building with in-home education and upgrades	In-home education and upgrades	Community Capacity Building
Total cumulative savings	$1596	$1400	$11
Cost to deliver $1 of savings (cost-benefit)[2]	$1.32	$0.86	$126.93

CCB

The CCB approach provided people with multiple exposures to energy saving conversations with ECs, energy efficiency experts and neighbours.

- The CCB approach emphasised strategies and measures for staying warm, reducing energy and saving money.
- The CCB approach did not deliver quantifiable energy and comfort savings.
- CCB group did not have statistically significant energy savings
- The CCB group helped to contextualise formal energy efficiency education within the familiar social context promoting the idea that other people 'like me' are also interested in energy efficiency and thermal comfort.
- $1 of energy and water savings required a $127 investment

Key factors that may have enhanced energy and thermal comfort savings include:

- multiple opportunities to receive energy efficient and thermal comfort messages and consolidate this knowledge;
- more exposure to role models in the local community who have been able to reduce their energy use.

EDUG

The EDUG approach entailed visits from experts who provided education and installed relevant upgrades.

- The EDUG approach emphasised strategies and measures for staying warm, reducing energy and saving money.
- The EDUG approach delivered effective energy and comfort savings. Energy productivity has improved in this group through reduced energy consumption and increased thermal performance/comfort.
- The EDUG group had average electricity saving of 1.4 kWh per day.
- $1 of energy and water savings required a $1.32 investment.

Key factors that may have enhanced energy and thermal comfort savings include:

- Hard wired physical upgrades that have lasting energy and thermal savings (eg draught proofing and insulation).

2 Level 3 cost benefit analysis, using cumulative electricity and water savings.

EDUG + CCB

The EDUG + CCB approach entailed visits from experts who provided education and installed relevant upgrades. It also provided people with multiple exposures to energy saving conversations with ECs, HEHs, energy efficiency experts and neighbours.

- The EDUG + CCB approach emphasised strategies and measures for staying warm, reducing energy and saving money.
- The EDUG + CCB approach delivered effective energy and comfort savings. Energy productivity has improved in this group through reduced energy consumption and increased thermal performance/comfort.
- The EDUG + CCB group had average electricity saving of 2.8 kWh per day.
- $1 of energy and water savings required a $0.86 investment.
- The EDUG + CCB group helped to contextualise formal energy efficiency education within the familiar social context promoting the idea that other people 'like me' are also interested in energy efficiency and thermal comfort.

Key factors that may have enhanced energy and thermal comfort savings include:

- multiple opportunities to receive energy efficient and thermal comfort messages and consolidate this knowledge;
- hard wired physical upgrades that have lasting energy and thermal savings (eg draught proofing and insulation);
- increased capacity to follow-up on measures received through home upgrade; and
- more exposure to role models in the local community who have been able to reduce their energy use.

Processes, key determinants for success, barriers, and drivers for each energy efficiency approach

For a Community Capacity Building approach to be successful, it needs to be:

- A long term approach (3-5 years) that provides opportunities for project staff to trial different approaches and reset project goals (see Project Processes and Organisational Analysis Report section 8.9 of Get Bill Smart Final Report).
- Community led (see Project Processes and Organisational Analysis Report section 8.9.2 *Energy Champions Community Networks and Integration*).
- Sufficiently resourced to enable training and up-skilling (see Project Processes and Organisational Analysis Report section 8.8.10).
- Embedded in an organisation that can provide HR and information support (see Project Processes and Organisational Analysis Report section 8.7.11).
- Accommodating of individual preferences for communication channels (e.g. one on one communication, community notice boards and social media) (see Project Processes and Organisational Analysis Report section 8.8.1).
- Accommodating of individual preferences for group forums and one on one interactions when delivering education and support (see Project Processes and Organisational Analysis Report section 8.8.1.
- Have strong linkages with organisations with both community development and sustainability skillsets (see Project Processes and Organisational Analysis Report section 8.8.1).

For an in-home education and upgrades approach to be successful, it needs to be:

- Sufficiently resourced to enable upgrades and training and up-skilling of staff (see Project Processes and Organisational Analysis Report section 8.6).
- Delivered by an organisation with administrative and field skills and a strong working knowledge of local context and energy efficiency and thermal comfort (see Project Processes and Organisational Analysis Report section 8.6).
- Utilise skilled home energy helpers who can assess and tailor to householder contexts (see Project Processes and Organisational Analysis Report section 8.6.4).
- Have strong linkages with organisations with both community development and sustainability skillsets (see Project Processes and Organisational Analysis Report section 8.7).

- Engaging the right staff. Ensure quality advice is provided that is tailored according to need. Householder engagement requires a very particular skillset – we recommend experts with compassion and interpersonal skills. Employ experts who are able to be empathetic (not patronising) in low income/vulnerable household settings. HEHs from GBS have the skills to achieve much of the tailoring needed with the support of systems that support their decision making related to tailoring (e.g. identifying high needs households, and households who need more or less education) (see Project Processes and Organisational Analysis Report section 8.8.3).
- Streamline administration to participants ensuring eligibility criteria are minimised. Ensure programs are open to all home ownership tenures. Reduce blockages to participation (see Project Processes and Organisational Analysis Report section 8.8.3.

How benefits from thermal and energy efficiency improvements are utilised by low-income households in a cool temperate climate; whether households choose reduction of energy use or increased thermal comfort; and, the impacts of these improvements on health and wellbeing

Overall benefits of GBS energy efficiency activities were gained in a variety of areas related to energy, heating, comfort, confidence with information, thermal and moisture performance of the house, community and personal connections, improved thermal conditions in the home, health and stress, and increased choices/options for energy use and comfort.

In this GBS study most householders were low energy users and these householders took opportunities to use extra energy, rather than save it, in response to energy efficiency measures. They used energy most often in order to attain thermal comfort and support related health needs. Alongside thermal comfort and health householders used extra energy for other reasons, most importantly, to support poor housing and appliance performance, because other occupants were not invested in energy efficiency or there were new occupants, for animal care, or because of a lack of investment by landlords.

Householders were often trying to stay warm enough so they could stay healthy and generally function in their lives. This priority indicates that when given a chance householders want to be well and productive.

Measured changes were observed in: overall electricity use, heater use, heating efficiency, hot water, change to comfort zone, moisture levels. Overall EDUG +CCB consistently came out with the best performance (in both household and on a per occupant basis).

Findings noted below are drawn from the detailed study unless otherwise noted (for a more comprehensive examination see Detailed Study report).

Overall electricity use

The detailed study report looked predominantly at winter (cold) periods before and after the GBS approach was delivered. Peak cold weather electricity use increased for all four groups after the GBS approach was implemented. It is recognised that this is primarily as a result of an unusually cold winter in 2015. CCB and EDUG + CCB (the community based groups) increased less than the REP group. EDUG (in greater Hobart) increased more. When factoring in household occupant rates, the EDUG + CCB households recorded a 22.7% reduction in energy consumption compared to the REP group in the after period (see Detail Report section 4.2 for closer examination). EDUG used slightly more than the REP group and CCB a little more again than EDUG.

Heater Use

Overall heating energy increased in all groups compared to the representative group in household comparison. These increases relate to the colder winter in the 2015 after period– householders warned us that the cold winter led to more heater use. EDUG+CCB were the only group with heating increases over that of the REP group on a household basis. However EDUG +CCB's increases correlated with increased time spent in the comfort zone (compared to other groups). The EDUG group had the greatest reduction in heater use, but also had a correlating reduction in time in the comfort zone. When assessed on a per occupant basis outcomes changed with all groups actually reducing heating energy compared with the REP group. The EDUG+CCB group had the biggest reduction on a per occupant basis.

Of note is that HEHs successfully encouraged many householders to shift heating strategies. HEHs suggested that householders transfer heating to more efficient heaters that were available in the house (see Detailed Report section 4.3.1)

Heating efficiency

Excluding houses that used wood fire and gas as their main heating, the EDUG + CCB group had the most significant increase in heating efficiency (25%) (see Detailed Report section 4.3.5 for an explanation of heating efficiency calculations and data). The EDUG group's average efficiency increased by 7.6%, CCB's by 0.5% and the REP group's efficiency decreased. Before and after heating efficiency changes showed a clear pattern of diminishing returns from extra heating energy input into house. As increased energy was pumped in, less came back as improvements to indoor temperatures. This pattern was related to the poor standards of thermal resistance of the building shells of the houses.

Hot water

On a household comparison of all households in the detail group, hot water increased most notably in the CCB group compared to REP group. The EDUG group's use also increased. The EDUG + CCB group's use was minimally different to the REP group. On a per occupant basis compared to the REP group, the EDUG + CCB group was the only one that reduced its use. Both the CCB and the EDUG increase their use when compared to the REP group on an occupant basis.

In home visits HEHS had retrofitted water efficient shower heads, hot water insulation and pipe insulation. These upgrades did support improvements in a range of houses (when viewing houses case by case). The bulk data also suggests that Hot Water (Tariff 41) usage decreased in the EDUG + CCB and EDUG groups. However neither the detailed or bulk data attributed statistical significance to this pattern.

Comfort

When looking at all households including those with non-electric heating and comparing them with the REP group only EDUG+CCB improved their comfort levels as a group. Both the CCB and the EDUG groups had slightly reduced comfort on average. When all houses with wood and gas heating as their main heating are taken out the same outcomes are still observed. The EDUG +CCB group had the most increased comfort and other groups had slight reductions of comfort levels. However, EDUG +CCB's time in the comfort zone did come with a correlating increase in heater use.

Whilst the linkages between thermal comfort and health outcomes was not directly measured in this project, research indicates that:

- Warmer homes reduce unnecessary deaths from cold
- Reducing condensation can reduce mould and resulting respiratory disease
- Improvements to thermal comfort can save more to the health system than money it will save on energy bills.

As discussed in the Cost Benefit Analysis report (Section 5.9.2) these thermal improvements may be the most significant outcome of the project.

Moisture levels

Surface condensation, moisture and mould issues were reported by a range of householders from all groups in both before and after surveys and interviews (see Bulk Report section 5.4.4 and Detailed Report section 5.1.6). The bulk study survey reported a reduction in window condensation for the EDUG group over the project period.

Humidity and moisture were acceptable in most houses but were actually borderline problems that require further investigation. Most people in the detailed group living in older and under-insulated houses presented with temperatures that only just stayed away from meeting dewpoint (and therefore stayed just away from serious condensation problems). Management by householders helped to limit moisture issues. Newer houses temperatures stayed well away from dew point in general when graphed. The EDUG approach did not seem to affect moisture levels adversely in general – but more investigation of the GBS data is needed on moisture levels and mould. One house with moisture and mould issues did report increased mould and moisture after an in-home education and upgrade visit, but there were other construction issue impacting this outcome.

Trade-offs between energy saving and improving comfort

Trade-offs between energy savings and comfort were made by many houses when the opportunity arose. When energy efficiency improved or energy costs went down householders used the extra 'slack' available. Householders tended to use any positive changes to energy efficiency or affordability to improve thermal comfort, particularly for wellbeing and health. We observed that in their complicated lives householders want, in general, to be healthy and functional (see Detailed Report section 5.2.10). If their situations allowed them a chance to make a positive change for health or wellbeing, they used it. Householders traded energy and comfort against each other (see heating comparisons in Detail Report section 5.3), but they also traded energy saving with other things too (including other household bills, groceries and treats for children and household performance related to moisture and mould).

Assist low-income households in Rokeby, Clarendon Vale and Greater Hobart to be more energy efficient.

This project worked with 498 low income householders, many of whom were unemployed and living below the poverty line.

The project assisted low income households in Rokeby, Clarendon Vale and Greater Hobart in the following ways:

- 272 houses received an in-home education and upgrades by participating in the EDUG and EDUG + CCB approaches.
- In total 61 houses received improved insulation.
- In total 26 houses received new curtains.
- A further 15 houses who participated in the REP group received an in-home education and upgrade as a prize after the study period.
- 498 households who completed surveys received grocery vouchers (these were distributed after various participation requirements were met).
- Approximately 340 people received a Stay Warm booklet during the project.
- A range of minor energy efficient measures were provided to people at community forums.

The project also provided intensive assistance to twelve low income people in Rokeby and Clarendon Vale who were recruited to be local energy champions. The champions were employed casually throughout the duration of the community capacity building implementation. They received:

- Training in energy efficiency and communication.
- In-home education and upgrade.
- 4 received improved insulation.
- 4 received new curtains.

Provide employment, training and commercial opportunities for local residents and businesses.

The Get Bill Smart Project provided 34 jobs for residents in the Greater Hobart region. 12 of these were specifically targeted at the project area in Clarendon Vale and Rokeby. The project also engaged and spent $277,000 on local Tasmanian businesses. In detail the project:

- casually employed 12 local energy champions over 15 months ($56,457)
- casually employed 10 local energy auditors over 12 months ($89,488)
- contracted energy data analysis that employed 7 people over a period of 3 years ($100,458)
- employed 2 research staff at the University of Tasmania for monitoring and evaluation (average 1 FTE)
- employed 9 project staff at SLT(various levels of commitment) over the project (average 2.5 FTE)
- purchased technical data logging equipment and commissioned product development from 4 companies ($126,761)
- purchased $64,013 worth of energy efficiency materials from Australian businesses
- subcontracted an additional $90,955 of energy efficiency materials (mainly insulation and curtains) from Tasmanian business
- spent in total $277,487 on Tasmanian businesses (NB excludes UTAS and SLT staff).

2.5 Conclusions

Get Bill Smart successfully trialled a community capacity (CCB) approach with an in-home visit approach (EDUG)in Greater Hobart. Through monitoring this trial we now better understand (with evidence) the processes, key determinants and possible outcomes that affect energy efficiency interventions program like Get Bill Smart in the Tasmanian context.

Despite householders often living in very poor housing stock and despite working with householders with limited capacity to make energy and comfort changes, GBS activities were still able to create various positive outcomes for householders. GBS evidence showed that in-home education and upgrade visits by Home Energy Helpers improve energy productivity by reducing energy use and increasing thermal comfort. The EDUG approach delivered 1.4 kWh/day of energy savings and had a simple payback of 10.3 years and cumulative cost benefit ratio of 0.8 Community Capacity Building (CCB) combined with in-home education and upgrade visits (EDUG) delivered 2.8 kWh/day of energy savings and had a simple payback of 9.7 years and cumulative cost benefit ratio of 1.3. This is an impressive result given that the CCB component, is new, novel, and has not been subject to years of review, reflection and project delivery efficiency gains.

Given the greater possible energy savings from the combined approach, and the potential for delivery improvements in the community capacity building component it is argued that a successful future program should include all aspects of the in-home energy efficiency visits and modified components of the community capacity building.

GBS evidence has outlined key structural barriers challenging moves made for energy efficiency in the Tasmanian context. Critically poor thermal performance of the stock and persistent socio-economic challenges still undermine energy efficiency and comfort efforts by householders and NGOs. Participants live at relatively low indoor temperatures, often under World Health Organisation recommendations and on very low incomes. It cannot be emphasised enough the significant limitations that such poor housing stock places on the capacity of householders to engage in energy efficient behaviours and to be comfortable in their homes. Just achieving one of these aims is difficult in such poor housing, with such limited financial capacity, while achieving both together seems near impossible.

GBS showed that for low income householder's affordability and health needs are closely affected by home energy use and comfort and therefore also need to be engaged with in energy efficiency in housing is to be achieved.

To overcome structural barriers the GBS team suggest the following policy initiatives:

- **Improve thermal performance of houses**
- **Develop a long term energy efficiency program based on current practice**
- **Refine and develop community engagement within a long term energy efficiency program, and**
- **Integrate health priorities with energy efficiency aims through all policy initiatives.**

Through a long term energy efficiency program with community engagement, improvement of the housing stock, and recognition of health priorities embedded in home energy use and home comfort there is an opportunity to transition householders towards better health and better productivity.

2.6 Recommendations

Recommendations are listed below.

Improve the thermal performance of houses in Tasmania (and southern Australia) through:

- Phase out energy-intensive hardwired resistive heaters in cold climates as they are inefficient, expensive and ineffective (see Detailed Report sections 4.3.1 and 4.3.2).
- Subsidise heat pump purchase (see Detailed Report section 4.3.2).
- Ensure minimum rental standards include roof insulation, reasonable draught proofing, hung curtains in the living area and hot water efficiency (the Detailed Report section 5.2.2 shows the significant benefits of these retrofits).

Develop a long-term energy efficiency program:

Programs need to be tailored to climatic conditions and to key capacity issues (rent/own, income, chronic or recurring health issue, disability, elderly, overshadowed house, thermally poor dwelling, old heaters, limited community networks/isolation). Contextual understanding is important to identify what tailoring is needed. For example, as shown in the Project Processes and Organisational Analysis Report (section 8.8.1 - Doorknocking), Community Energy Champions were key to program success ensuring access to those harder to reach or isolated individuals.

Develop community engagement and capacity building further by:

- Ensuring all community capacity building projects have sufficient time for recruitment and training, and to integrate key ideas, concepts and behaviours into the community (see Project Processes and Organisational Analysis Report sections 8.8.4 and 8.8.1).
- Providing strong local leaders in low income areas who are physically situated within the community and with significant resourcing and support, to manage, mentor and train low capacity community members to become (and continue to be) community champions (see Project Processes and Organisational Analysis Report sections 8.8.5 and 8.8.9).
- Acknowledging key priorities and drivers of behaviour within different communities and demographics (see Project Processes and Organisational Analysis Report sections 8.3.4 and 8.8.8, and Milestone 4).
- Genuinely valuing the importance of respect and care for the successful engagement of people with energy efficiency and thermal comfort behaviours by ensuring appropriate time and capacity for initiating and maintaining relationships (see Project Processes and Organisational Analysis Report section 8.7.4).
- Ensuring that metrics designed to measure program success go beyond simple attendance numbers and easily measurable engagements (see Project Processes and Organisational Analysis Report section 8.9.2).
- Placing a value on difficult to measure such as the slow movement of knowledge through social networks, the small changes that happen over time as a result of exposure to ideas and norms, the motivation people give each other through good experience and the shift to different 'normal' ways of doing things (see Detailed Report case studies).
- Identifying ways that governments can work with community networks, being sensitive to the fact interactions with government in low-income areas are generally avoided by community members (see Project Processes and Organisational Analysis Report section 8.9.2).
- Ensuring that existing knowledge about local culture, practices, limitations, expertise and challenges are integrated into program design and implementation (see Project Processes and Organisational Analysis Report section 8.9.2 – Energy Champion community networks and integration in community).
- Supporting capacity exchange within the community to allow existing knowledge to be shared and developed (see Project Processes and Organisational Analysis Report section 8.9.2.

Integrate health priorities with energy efficiency aims:

Trade-offs in GBS and overseas evidence shows that benefits of energy efficiency upgrades in cold climates are predominantly taken as thermal gain (see Detailed Report section 5.3). Energy savings are taken in this way because health and function are important to householders. This take-back can improve health outcomes on a broad scale reducing the drain on health systems.

The health gains from improved thermal comfort are significant. Studies from New Zealand have linked energy efficiency programs (such as installing insulation) with savings to the health system. A study of 1350 households that installed ceiling insulation, concluded that:

"Insulating existing houses led to a significantly warmer, drier indoor environment and resulted in improved self rated health, self reported wheezing, days off school and work, and visits to general practitioners as well as a trend for fewer hospital admissions for respiratory conditions." (Howden-Chapman et al. 2007).

In the GBS study we observed participants using energy saving techniques and technologies to enable them to heat their home to higher degrees or for longer for the same price.

For many participants, the need for greater heating was directly linked to health requirements such as the need to manage chronic illness, seasonal colds and flu or significant health emergencies. Examples of these behaviours can be seen in the case studies presented in the Detailed Report (see case studies 2,6,8, 6,14,17,20,24, 41, 44, 49, 113).

This linkage is strong and the health benefits tend to overwhelm the energy benefits by several magnitudes. In a review of the NZ "Heat Smart" Program the health benefits are attributed to be 99% of the project benefits. These health benefits include reduced mortality, less hospitalisations and reduced pharmaceutical use. Based on these findings for every $8 of energy saving their was $608 in health benefits[3] Grimes, A., Howden-Chapman, P et al (2011)

We argue that thermal comfort changes are a significant component of the GBS program and the impacts of these should not be discounted relative to changes in energy use. In fact health outcomes are likely larger than energy outcomes. In order for this to be recognised at a program **level improving thermal comfort needs to be treated as a "health intervention"**.

Opportunities for linking thermal comfort and energy efficiency with health programs are currently limited, especially as preventative health or so called "Social determinants of health" receive much less funding than emergency or general practice care. A potential policy initiative could be the creation of Social Impact Bonds[4] issued at a population level to change health incomes by improving the thermal performance of households. We have not critically examined this possibility however further research into this may help to consolidate linkages and improve further policy directions.

3 Low scenario, Table 30, pp 26 http://www.healthyhousing.org.nz/wp-content/uploads/2012/05/NZIF_CBA_report-Final-Revised-0612.pdf

4 http://www.socialventures.com.au/investment/social-impact-bonds/

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The Get Bill Smart final report includes separately available sub-reports. The sub-reports and authorship are as follows:

Get Bill Smart Bulk Study
Authors: Michelle Gabrielle, Anton Vikstrom, Todd Houstein, Millie Rooney, Phillipa Watson.

Get Bill Smart Detailed Study
Authors: Millie Roonie, Phillipa Watson, Steve Watson.

Get Bill Smart Cost Benefit Analysis
Authors: Anton Vikstrom, Todd Houstein, Phillipa Watson.

Get Bill Smart project processes and organisational analysis
Authors: Millie Roonie, Michelle Gabrielle.

Acronyms and definitions

Acronyms

AAA showerhead	A water efficient showerhead with a good level of efficiency
CFL	Compact Fluorescent Lighting
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CVR	Clarendon Vale / Rokeby suburban area
EC	Community Energy Champions (sometimes called "Power Rangers" in the field)
EO	Community Engagement Officer
Before Survey	Pre-activity survey
After Survey	Post activity survey
GH	Greater Hobart area
GBS	Get Bill Smart (the name of this project)
HEH	Home Energy Helper
LIEEP	Low Income Energy Efficiency Project
MA	Mission Australia
SLT	Sustainable Living Tasmania
UTAS	University of Tasmania

Definitions

Consortium – The three organisations implementing the Get Bill Smart Project. These organisations are: Mission Australia, Sustainable Living Tasmania and University of Tasmania. Individuals working on the GBS project are referred to as 'consortium members'.

GBS Approaches – Any of the Get Bill Smart research approaches including the Representative group.

Energy Efficiency Activities – Any of the active energy efficiency approaches undertaken in the Get Bill Smart Project. This includes: In-home education and upgrades and community capacity building (EDUG + CCB), In-home education and upgrades only (EDUG) and community capacity building only (CCB).

Heat pumps – Reverse Cycle Air Conditioners used in heating mode. These are efficient heaters using 1/3 of the energy to heat a space compared to resistive heating.

GBS Approach group acronyms

CCB – Community capacity-building – Activities conducted through community engagement approaches that have the intention of influencing behaviour, in this case energy use behaviour and related activities in households.

EDUG – In-home education and upgrades – Visits to houses conducted to encourage energy efficiency. In- home visits helped householders to make changes to their homes and their practices in order to encourage reductions of energy used in the home. Auditors, called Home Energy Helpers, conducted these visits and installed most upgrades.

EDUG+CCB – This is a combined approach that included both in-home education and upgrades and exposure to community capacity building activities.

REP – Representative Group – These participants provided before and after data in the form of a survey and energy bills. Some participants in the detailed study also had data loggers installed and were interviewed. This group received grocery vouchers to recognise their participation.