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CRC

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Working Paper 2: Focus Group Results



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Executive Summary

This report is a milestone deliverable from CSIRO for the EnergyFit Homes Initiative, a project that seeks to empower consumers to recognise and value homes with better health, comfort and sustainability benefits and lower running costs. It is formally known as Project RP3016 and funded by the CRC for Low Carbon Living and other project parties.

Twelve focus groups were conducted in four east coast cities and regions to explore the understanding of features that contribute to energy efficient homes, and also the understanding of energy efficient rating tools and information systems. These perspectives were sought from owner occupiers, investors and tenants. In total, 107 participants were involved, including 26 participants in Canberra, 25 in Sydney, 27 in Brisbane, and 29 on the NSW Central Coast.

A survey was administered prior to the commencement of focus group discussion and gathered attitudes towards energy efficient features and collected basic demographic information. The survey and focus group discussions resulted in a range of findings that provide opportunities for enhancing the context through which energy efficient housing is promoted and supported.

The findings also identified pathways and approaches to communication that could enhance the understanding, uptake and corresponding action on energy efficient housing choices. Specific top-line findings are provided in the dot points below.

Differences in sample

- The participant types of owner occupier, investor and tenants elicited differences in findings.
- The climatic zone location of participants affected their reliance and awareness of heating or cooling systems.
- There were no obvious differences in findings between metropolitan and regional participants.

Priorities for renting and purchasing

- From a set list of options, the most important feature in a home for all participants was 'good natural light'. Second-top priorities were ceiling insulation for owner occupiers, solar hot water for investors and an air-conditioner for tenants.
- From open-ended discussions, the most important feature in a home was location. Second-top priorities were building design for owner occupiers, age and quality of the building for investors, and natural light for tenants.

Property market conditions and availability

- The current property market is a landlords' market in the southern cities and region, and a tenants' market in Brisbane. This affected the range of choice that tenants had in terms of property features.

Attitudes towards the environment and energy security

- Participants believed that climate change and the depletion of energy resources are a problem for society and that energy saving helps reduce climate change.

Perceptions of home comfort

- Most participants agreed with the statements that 'a comfortable home is naturally warm in winter and cool in summer' and that 'a comfortable home has good natural light'.
- The majority of participants considered comfort to be about temperature, where extreme heat and cold were minimised
- Participants perceived that an energy efficient home would require 'sacrifice' of heat or cold, or of quality of life.
- The most cited personal experience of discomfort was a lack of insulation.

Perceptions of energy efficient and sustainable homes

- Most participants stated that rooftop solar PV was a key feature of an energy efficient home, reflecting a misunderstanding of how an energy source contributes to efficient use.

- The second most cited aspect of an energy efficient home was energy efficient lighting (29%), followed by insulation (24%).
- An 'energy efficient home' was a term that provided the most clarity to participants, and offered them a more defined scope of a home with installed features that ensured a more efficient and less costly consumption of energy.

Knowledge and use of energy efficient features

- Participants identified that most (63%) had installed shutters/blinds and/or curtains (57%), and one quarter had installed ceiling insulation (49%), reverse-cycle air-conditioner (44%), wall insulation (30%), modifying house orientation (29%) and ceiling fans (29%).

Knowledge of appliance ratings

- Two-thirds of participants stated that they consider energy efficiency rating 'most of the time' or 'always' when buying new appliances.
- Many participants stated that the energy rating sticker was the main influence behind their purchase choice.

Perceptions of energy rating tools and information systems

- Participants liked the comparative energy display as it was colourful, clear and used familiar info graphics, but they did not trust the assumptions.
- Participants found the colours of the thermoimage of heatbleed counterintuitive.
- The Energy Efficiency Rating from the ACT was favoured for using the familiar energy star rating and providing advice for energy improvements, but was considered to be limited in the method and the rating did not reflect comfort or cost.

Influential information sources

- From a set list of options, the more trusted sources of information were architects, electricians, government agencies, friends, family or neighbours as well as building certifiers, builders and plumbers.
- From a set list of options, the less trusted sources of information were real estate agents, property developers, retail shop staff and property valuers.
- From a set list of options, participants' preferred channels of information delivery were an energy-rating tool, government websites and case studies.

Building regulations and certification

- For some participants, energy efficiency required through building regulation caused significant frustration, with the regulations perceived as being mismatched with the climatic conditions and housing style.

Landlord-Tenant dynamics

- Investor participants' energy efficiency priorities for their investment properties differed significantly from the decisions and features they sought for their own home.
- Many tenant participants did not expect their landlord to provide energy efficiency improvements, or were afraid to ask in case the rent was increased.
- Many investors described the value they received from long-term, stable tenants if they were comfortable and satisfied.

Broad perceptions of energy efficiency

- A large number of participants agreed with a statement that improving the energy efficiency of the home is too expensive.
- The main motivation for owner occupier participants to install energy efficient features in their homes was to reduce energy costs.

- Investor participants indicated they would be hesitant to invest in energy efficient features for an investment property, due to a perceived insufficient financial return.
- Tenant participants were motivated to adopt energy efficiency initiatives to reduce energy costs and benefit the environment.

Specific energy efficiency features

- Energy efficiency with perceived benefits included natural lighting, rooftop solar PV, insulation, and floor coverings.

Willingness to pay

- From a set list of options, most participants (53%) indicated that the house orientation (i.e. North/East aspect) and/or installation of a reverse-cycle air-conditioner (51%) influenced their purchase decision.

In summary, aspects of the context in which energy efficient housing is delivered that were identified as being important to increasing uptake were the property market conditions, the tools and information systems applied to evaluate energy efficiency, and the policy mechanisms to promote energy efficient buildings and renovations.

In addition, content, messaging and delivery were three aspects of communication that emerged from the findings as crucial to the uptake of energy efficient initiatives in renting, buying and renovating. This included building on familiar and positive energy efficiency features, crafting the right messages, and enhancing communication delivery.

Arising from the findings of this report, the next stage in this research is to conduct a specialist survey with builders, developers and real estate agents to further investigate the gaps in information and skills to support increased sales and rentals of energy efficient homes. In parallel, a national survey representative of the Australian population will be conducted to investigate individuals' perceptions to specific energy efficient features, and stakeholders' (owner occupiers, investors and tenants) perceptions of the useability and potential influence of voluntary or mandatory home carbon rating regulation. These findings will be delivered in February 2015.

Introduction

This report is a milestone deliverable from CSIRO for Project RP3016: 'Enhancing the market for energy efficient homes at point of sale and lease'. It is funded by the CRC for Low Carbon Living and other project parties. This project is publicly referred to as the "EnergyFit Homes Initiative: Empowering consumers to recognise and value homes with better health, comfort and sustainability benefits and lower running costs".

The context in which this project is situated is that 21 percent of total Australian emissions can be attributed to household energy use (Australian Government, 2011). Numerous assessment and rating tools have been developed to monitor and motivate buyers of low carbon homes. However, the lower-than-anticipated purchase demand, despite the higher potential sale value for these homes, suggests that this emphasis has not resonated with home buyers.

In response, this project proposes a consumer-facing, end-user perspective to understand how energy rating tool metrics are utilised, and how the new and existing home buyer and leasing market can be engaged by these or other metrics. This project aims to reduce greenhouse gas emissions from households by increasing market interest in low carbon homes. The project will explore key information needs and behavioural factors of home buyers and lessees, and the role of rating tools in influencing the market for sale and rental of low carbon homes. Specific project objectives include:

- To understand the motivations and information needs of homebuyers and lessees and sales intermediaries around the point of sale and lease;
- To identify strategies for improving information flow in the home sales and leasing process and marketing channels and home buyer purchasing and leasing processes;
- To determine alternative features for home energy rating/assessment tools that influence home buyers, renters and financiers toward valuing sustainability factors in their purchasing decision;
- To engage the wider real estate, property and energy efficiency industry in the identification of potential implementation pathways for home energy rating/assessment tools; and
- To converge the outcomes into a functional specification for consumer-centred tools that will increase market interest in low carbon homes.

The research is divided into two work packages proceeding in parallel: Package 1 focuses on market structure and tool implementation, and Package 2 focuses on end-user information needs and behaviour research. Deliverables include:

Work Package 1

1. High level business case for industry financial partners to validate industry benefits of project
2. Review report of stakeholders, rating landscape and datasets.
3. Case studies of current and past regulatory and non-regulatory approaches to point of sale/ lease low carbon home disclosure.
4. Report on costs, benefits, potential market impacts and end-user support for low carbon disclosure.
5. Business plan for the administration and delivery of a disclosure system, including incentive structures, market channels and governance structures required to underpin low carbon disclosure.

Work Package 2

- Baseline Report on focus group research in four capital cities, establishing the baseline understanding of low carbon home rating tools by home buyers and renters.
- Baseline Report on telephone interviews with builders, developers and real estate agents on the gaps in information and skills to support increased sales and leasing of low carbon homes.
- Report on national survey of the understanding and priorities regarding specific low carbon home features as perceived by home buyers, renters, real estate agents, and builders.
- Report on the testing of message profiles to determine the phrases that motivate home purchases and leasing. These profiles will enhance the existing Liveability- LJ Hooker baseline consumer sentiment index.
- Functional specification for an end-user focussed assessment/ rating tool based on the combined results of Work Package 1 and 2.

This report corresponds to Work Package 2.1, which is a baseline report on focus group research in four capital cities to understand how participants perceive energy efficient homes, to establish the baseline understanding of energy efficient rating tools and information systems, as well as explore the understanding of features that contribute to energy efficient homes. It presents results from focus groups conducted in four east coast cities and regions. These perspectives were sought from home owner occupiers, investors and tenants.

Research Design and Methods

Sample selection

The three Australian capital cities of Canberra, Sydney and Brisbane were selected to represent metropolitan areas within different climatic zones (cold temperate, warm temperate and sub tropical respectively), as this impacts heating and cooling choices that influence energy consumption. Canberra was also selected for the existence of mandatory reporting of energy efficiency ratings for residential properties. To compare whether metropolitan perspectives differed from regional area participants, a fourth location was chosen within a regional area. This was the warm temperate NSW Central Coast, where a group was convened in Erina.

Three separate participant types were recruited to explore whether these types hold different perceptions and knowledge of energy efficiency and associated information systems and tools. These three participant types were current tenants of residential rental properties, current or intending owner occupiers of residential properties, and current or intending investors in residential properties. Suitable participants were identified according to set criteria for each target group, and are described below in Table 1.

A research recruitment company was contracted to recruit participants. Participants were members of the recruitment company's contact database residing within the chosen study locations. In order to engage sufficient participants for each for each focus group, some flexibility in the recruitment criteria was required. For example, it was preferred that the timeframe within which investors and owner occupiers had purchased their properties be as short as possible to ensure they were able to accurately reflect upon their purchase decision and had recently been engaged with the property market in Australia. However, in order to engage enough participants for each focus group within the allocated timeframes and budget, an absolute restriction on this purchasing timeframe was not feasible. All participants were aged 18 years or over, and each group included a mix of both males and females. Quotas for demographic criteria were not set. This was because the selection criteria below were considered a sufficient limitation by the available recruitment companies that had limited databases per location to suitably satisfy both the selection criteria of type as well as demographic criteria.

Table 1 Criteria for participant recruitment

PARTICIPANT TYPE	CRITERIA/PREFERENCES
Tenant	<ul style="list-style-type: none">• Currently a tenant in a rented property
Investor	<ul style="list-style-type: none">• Currently owns a residential investment property, preferably purchased within past 3 years and located in or close to study locationOR• Intending to purchase a residential investment property, preferably within the next 12 months and located in or close to study location
Owner-occupier	<ul style="list-style-type: none">• Currently owns and lives in their residential property, preferably purchased within past 3 yearsOR• Intending to purchase a residential property, preferably within the next 12 months

A focus group was conducted with each of the three groups in the four locations. In total, twelve focus groups were conducted in September 2014, across four locations in Australia: Canberra, Australian Capital Territory (ACT); Sydney and the Central Coast, New South Wales (NSW); and Brisbane, Queensland (Qld). The resulting number of participants across these groups and locations are shown below in Table 2. In total, 107 participants were involved, with between seven and ten participants per focus group. These included 33 current or intending owner occupiers, 37 current or intending investors, and 37 current tenants. Per location, there were 26 participants in Canberra, 25 in Sydney, 27 in Brisbane, and 29 on the NSW Central Coast.

Table 2 Participant sampling by group and location

PARTICIPANT TYPE	CANBERRA	SYDNEY	BRISBANE	NSW CENTRAL COAST	TOTAL
Owner-occupier	8	7	9	9	33
Investor	9	9	9	10	37
Tenant	9	9	9	10	37
Total	26	25	27	29	107

Survey (Qualitative and Quantitative data)

A pre-survey was administered prior to the commencement of focus group discussion to gather individual attitudes towards energy efficient features as well as basic demographic information. Participants were aware about the energy efficiency focus of the research and the involvement of CSIRO and the CRC for Low Carbon Living in the research design and support.

The survey took approximately 15 minutes to complete. The focus group survey is provided in Appendix A.1.

The core survey questions were the same for all participants, but several specific questions were tailored for each of the three types of participants. Questions involved a 5-point Likert scale, where participants had to list their responses along a five point scale from 'strongly agree' to 'strong disagree', or similar. Open-ended qualitative questions were asked. In addition, questions requiring ranking of set options were asked.

One ranking question asked participants to identify their top priorities of property purchase or rental from a list of options. This question did not require specific consideration of features that may be considered energy efficient, but instead presented features that were directly and not directly associated with energy efficient products/homes to understand how participants ranked those items. The list included nine features to trade off: air-conditioner, ceiling fan, ceiling insulation, good natural lighting, new bathroom, new kitchen, solar hot water, solar panels, and wall or floor insulation. This was intentional as previous research has indicated that sustainability features are less valued than other more visible features such as new kitchens and bathrooms (Crabtree and Hes, 2009; Dowson et al., 2012).

This ranking question asked best-to-worst scaling questions to elicit participants' preferences and trade-offs amongst nine different home attributes. Therefore nine sets with four attributes each were presented to respondents repeatedly. Participants were asked to choose the most important and the least important to them in each of the pre-defined sets of four attributes. A score between 4 and -4 was calculated, representing the sum of the number of times that each attribute was most preferred (maximum of four times allowed) minus the number of times it was least preferred (maximum of four times allowed). The resulting data table presents mean scores and standard deviations for each attribute. A positive mean score means that the attribute was chosen as a 'most preferred' options more times than it was chosen as a 'least preferred' option. Likewise, a negative mean score means that the attribute was chosen as a 'least preferred' options more times than it was chosen as a 'most preferred' option.

The attitudes, perceptions and knowledge held by participants were explored in the survey, drawing from the value-belief-norm theory, which can be useful in explaining judgements of support and acceptability of programs and policies and be a determinant of behaviour change when applied appropriately (Steg et al., 2005). In this research, however, only attitudes, perceptions and knowledge were explored as this section was a small part of the larger research objectives.

The attitudes and beliefs questions were asked to identify pro-environmental behaviour. While some studies have found that pro-environmental beliefs and energy security concerns are important predictors of energy efficient behaviour, research by Biel and Thøgersen (2007) has suggested that this association is weaker for behaviours that involve high cost investments. The discrepancy between attitude and behaviour is widely recognised in the literature (Kollmuss and Agyeman, 2002). For example, a recent Australian study has suggested that there is a clear gap between householders' pro-environmental attitudes and actual energy consumption behaviours and that a culture of unsustainable consumption is apparent in all segments of the population, including those who present pro-environmental attitudes and intentions (Newton and Meyer, 2013).

One of the objectives of the survey was to explore householders' notion of home comfort and its relationship to energy efficient homes. This is because previous research has shown that individuals' perceptions of comfort can either hinder or facilitate the adoption of energy efficiency technology (Berry et al., 2014; Dzidic and Green, 2012; Organ et al., 2013). Shove (2003) identified that the concept of comfort is constructed according to what individuals perceive as the norm for 'comfortable', which is dependent on social practices that evolve across time and place. The survey explored participants' level of agreement concerning two aspects of comfort within the home: heating/cooling and lighting. Open-

ended questions regarding comfort were also asked, and analysed in the context of the four aspects related to building occupants' perception of comfort identified by Frontczak et al. (2012): visual, acoustic, thermal conditions, and air quality.

For some of the survey questions with open-ended response options, a word cloud was used to display the result. In the word cloud, the font size for each word is determined by the number of times mentioned, where a larger word has been mentioned more times.

Several questions explored whether monetary cost and benefits were the main reasons why householders would accept higher prices for energy efficiency. These questions were explored as previous research has shown that saving money is seen as the most compelling reason for owner occupiers to improve the energy efficiency of their homes (U.S. Department of Energy, 2010), while consumers perceived cost to be the greatest barrier to the implementation of sustainable features (McGee et al., 2008). Previous studies also outlined how householders need to perceive and value the benefits of the technology in order to influence its adoption (Willand et al., 2012).

The survey was analysed using Excel and STATA statistical software. The qualitative responses to the survey were coded in Excel spreadsheets using a thematic approach. STATA Statistical software was used to produce the frequency tables and summary statistics provided in this report. Where appropriate, data is presented by participant location and/or participant demographic group (tenants; owner occupiers and investors).

Focus group discussions (Qualitative data)

The focus group method was adopted as this research method is particularly useful for drawing upon participants' attitudes, feelings, beliefs, experiences and reactions. The group setting and potential for interaction also provides the researcher with a basis for exploring the range of issues or experiences that may exist amongst participants (Krueger and Casey, 2000).

The focus groups were 90 minutes in duration and were facilitated by two researchers. The process for conducting the focus groups was semi-structured. A pre-determined list of questions was used to guide the discussion, with the researchers posing more probing questions as interesting topics and comments arose. These guiding questions and schedule of visual prompts are provided in Appendix A.2.

Visual prompts were also used during the focus groups to initiate discussion. Firstly, five arbitrarily-selected images of homes (of a 1930s Art Deco apartment, a 'Queenslander' wooden home, a 1950s brick home, a small backyard granny flat, and a caravan with lean-to) were distributed to prompt an identification of features that could contribute (or detract from) a sustainable or energy efficient home.

Focus group participants were also shown three energy rating tools images that illustrated the energy use of a property that they could potentially buy or rent (provided in Appendix A.3) and asked their views on the information provided, the style of communication, the benefits or drawbacks from the tool, and whether the information would influence their decision to purchase or rent a property. The first image was an info-graphic provided on the AGL customers personal portal to compare their home with an 'average' and an 'efficient smarter' home as well as suggestions for reducing energy consumption in the home, and is provided in Appendix A.3.1. The second was a thermoimage of 'heat bleed' from a row of terrace houses, where the red colour signifies hotter areas and thus greater heat loss, while the bluer areas display a cooler area and thus less or no heat loss from the buildings. The thermoimage is displayed in Appendix A.3.2. The third image was an Energy Efficiency Rating (EER) certificate from the ACT, which is currently used for the sale of homes, and is displayed in Appendix A.3.3.

Participants were provided with a few minutes to review the images, and then provide their immediate responses in the discussion. Due to timing constraints, the ACT participants were not able to review the other two images, and thus their responses are not included in these results. The EER certificates were familiar to ACT participants as they have been in use for a decade, and thus the responses were more critical than hypothetical.

The focus group discussions were audio-recorded and transcribed verbatim to allow thorough analysis and quotation. The focus group discussion transcripts were analysed to identify emerging themes regarding attitudes towards energy efficient homes, priorities for property purchase and rental, influential factors and information, and perceptions of energy efficiency rating tools. The transcripts were analysed using descriptive analysis and methods informed by grounded theory. Grounded theory, used in its pure form, draws themes from transcripts or other data and seeks to generate a theory from such themes rather than merely testing an existing theory (Hoepfl, 1997). This process was conducted through the use of NVivo 9, a form of Computer Assisted Qualitative Data Analysis Software (CAQDAS). This software provides distance from the detailed transcript to code the themes, sort and link data segments, and allow comparisons (van Hoven and Poelman, 2003). To ensure validation of the emerging themes, coding completed separately by the researchers was compared and discussed to finalise the coding scheme (Fleming and Vanclay, 2009).

Demographics

The intention of the participant sample was to reflect the general population in terms of gender, age and income. However, the additional criteria for participant selection as an owner occupier, investor or tenant, outlined in the sections above, resulted in a slightly skewed sample. In particular, property ownership requires a certain level of financial ability, which may not be as feasible for lower income earners and resulted in a skew of average income.

The total focus group sample was skewed towards female participants (63%) and younger respondents, with 77% of participants aged between 25 and 49 years old, with no difference between the three participant types of owner occupiers, investors and tenants. Participants' employment status was also skewed, with three-quarters of participants employed either full-time (52%) or part-time (23%), as shown in Figure 1. Participants' household status was similar to the Australian population, with only shared households being overly represented, and these are displayed by the two comparative bars with census and participant data.

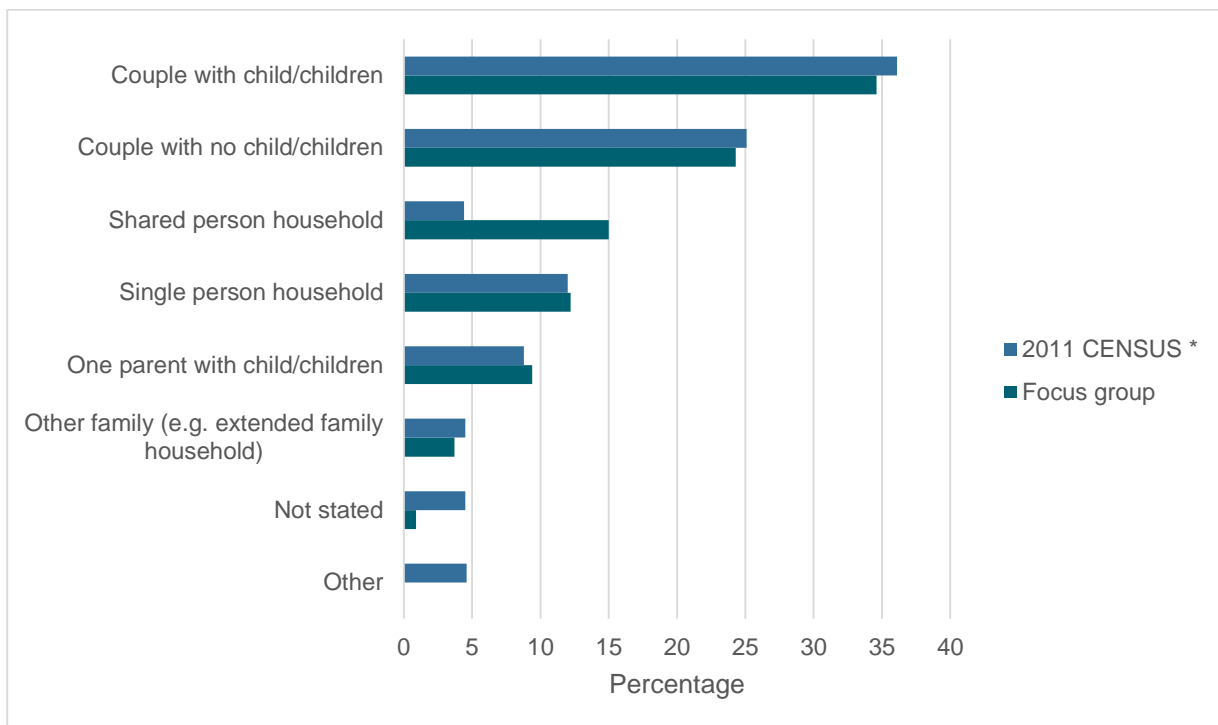


Figure 1 Percentage of focus group participants by household status (population aged 18 and over)

As shown in Figure 2, focus group participants' income was skewed towards higher income earners (those earning above \$65,000/year), with a considerably higher number of focus group participants earning above \$104,000/year when compared to the Australian population.

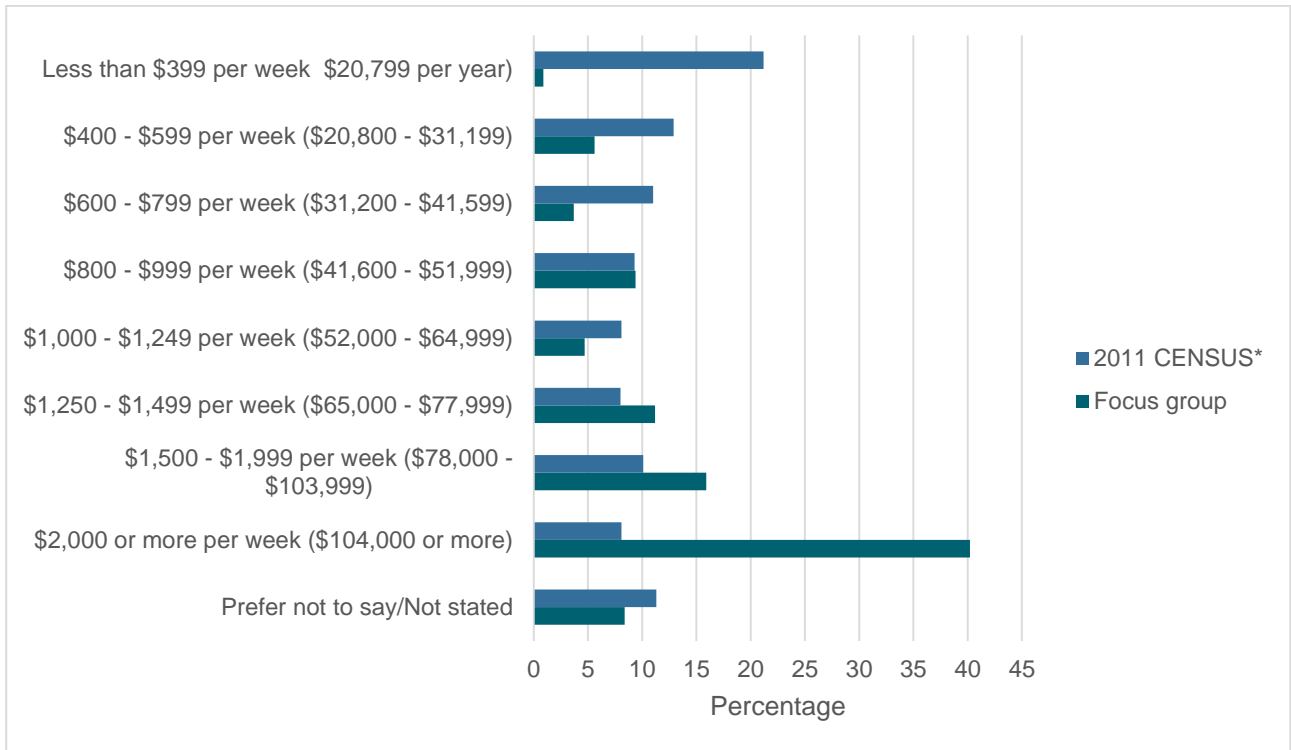


Figure 2 Percentage of focus group participants by income level

In terms of housing type, 65% of focus group participants lived in detached homes, with 16% living in semi-detached homes and 18% living in apartments. Nearly half of the focus group sample were renting (46%), as some participant intending to buy or currently owning an investment property were in rental accommodation. Approximately half were owner occupiers (51%). A small number of participants (3%) lived in public housing. Tables with more detailed demographic information about the focus group sample are provided in Appendix A.4.

Findings

The findings from analysing the focus group transcripts are displayed in four main sections:

1. Context in which participants are buying and renting,
2. Knowledge and perceptions of energy efficiency, including notions of home 'comfort',
3. Influence of a variety of information sources, including existing ratings tools and information systems, and
4. Perceived benefits and barriers to improving energy efficiency.

The responses from the survey and the outcomes of the focus group discussions are both presented in each section of findings to initially provide individual participants' privately reported views, followed by the views shared through group discussion. This presentation allows the dataset of individual perspectives to be contrast with a group perspective, and to contrast a set list of options offered in the survey to the open-ended discussions.

Each section contains the findings presented in various ways depending on the most logical approach for that topic and the related material. Findings are either split by location (Canberra, Sydney, Brisbane and the NSW Central Coast), by participant type (owner occupier, investor and tenant), or presented as an overall summary. Some sections present the findings in tables, where the material was sufficient and informative. In addition, verbatim quotes relating to each of the prominent themes drawn out through qualitative analysis have been included to best illustrate the perspective of the participants.

The report closes with a discussion drawn from the findings, including identified opportunities for enhancing and increasing uptake of energy efficient housing in Australia.

Context of the focus group participants

This section of findings provides the context within which the focus group participants are purchasing and renting properties. It presents the participants' priorities for renting and purchasing, and perceptions of the property market within which they are buying or renting. The sources of the data (survey and discussion) are identified separately.

Priorities for renting and purchasing

- From a set list of options, the most important feature in a home for all participants was 'good natural light'. Second-top priorities were ceiling insulation for owner occupiers, solar hot water for investors and an air-conditioner for tenants.
- From open-ended discussions, the most important feature in a home was location. Second-top priorities were building design for owner occupiers, age and quality of the building for investors, and natural light for tenants.

The survey findings of the top three priority features identified by the majority of participants from nine options when buying or renting a home are displayed in Table 3. For the total participants, the top priority was 'good natural light'. For the owner occupier group, the second most important feature was ceiling insulation, followed by a new kitchen. For the investors group, the second most important feature was solar hot water, followed by wall or floor insulation, solar panels and a new kitchen. For the tenants group, the second most important feature was an air-conditioner, followed by ceiling insulation, then a new kitchen. Further details are provided in

Table 3 Features that are most important for participants when purchasing or renting a home

	Overall	Owner-occupier	Investors	Tenants
1	Good Natural Light (M 1.64; SD 1.84)	Good natural light (M 1.82; SD 1.91)	Good natural light (M 1.95; SD 1.68)	Good natural light (M 1.19; SD 1.99)
2	Ceiling Insulation (M 0.22; SD 2.04)	Ceiling insulation (M 0.48; SD 2.28)	Solar Hot Water (M 0.46; SD 1.66)	Air-conditioner (M 0.61; SD 2.07)
3	New Kitchen (0.19; SD 1.42)	New Kitchen (M 0.30; SD 1.43)	Wall/Floor Insulation (M 0.38; SD 1.74)	Ceiling insulation (M 0.27; SD 2.27)

Note: M = mean; SD = Standard Deviation; Mean represents the average ranking allocated by participants to each feature.

During the focus group discussions, participants were also asked to describe their top priorities when seeking a home to buy or rent, without a set list of options. They were asked to describe these priorities, clarifying that these may or may not be related to energy efficiency. The findings below identify the priorities split by type (tenant, owner occupier and investor), with any differences between locations (city and region) identified. In contrast to the survey data, the main priority stated for all participant types was location. The other priorities differed by participant type. These differences in the survey and discussion datasets are likely due to the open-ended approach of the focus groups, while the survey provided set options only and did not offer location as an option. As the findings vary greatly between participant types, these are presented in separate sections.

OWNER OCCUPIERS

For owner occupiers in all four locations where the focus groups were conducted, location was the overwhelming priority feature that they sought when purchasing a home. Their definition of location varied and included neighbourhood-level features, such as proximity to current schools, public transport and shops; social connections, such as friends and family members; the natural features of that location such as views, bushland and beaches; and commuting distance to the city centre. Location was described as a priority because it could not be changed, unlike many other housing features.

I don't care about the house, I just want it to be in the right spot (Owner occupier focus group, NSW Central Coast, 10/9/14)

Several owner occupiers described how location choice dominated all other attractive features:

I'll buy that house because it's got solar panels [but] if it's not in the location it won't happen. (Owner occupier focus group, Brisbane, 18/9/14)

The second most-mentioned priority for owner occupiers seeking to buy a home was the design of the actual building. Within this theme, three design features were identified. The most common design feature was natural lighting:

You can't get natural lighting [if it's not there to start with], you can't get some of those features no matter what you do ... The aspect - you can't turn the building around. (Owner occupier focus group, NSW Central Coast, 10/9/14)

The layout design was also an important feature to a range of owner occupiers from those with young children seeking to avoid stairs to more senior owners who needed single level layout and sufficient space for guests:

The one level, the single storey was definitely on the list. The other things were just a bonus. (Owner occupier focus group, NSW Central Coast, 10/9/14)

Finally, the building material was an important design feature:

One of the things on my list was a brick home because of the heat and because of personal experience. (Owner occupier focus group, Brisbane, 18/9/14)

Installed features were the third priority for owner occupiers when buying. These included polished floorboards, gas heating and cooking and a water tank plumbed into the house.

Additional but less-mentioned priorities for owner occupiers were the purchase price and the size of the floor space:

I think price is probably the ruling thing. I mean, we all have an amount of money that we know we can spend and we're also trying to live in certain areas (Owner occupier focus group, Brisbane, 18/9/14)

Space ... we wanted space. So four bedrooms, a couple of living areas, space for the kids... (Owner occupier focus group, Canberra, 8/9/14)

INVESTORS

Location was the main priority for investors seeking to purchase a property for rent. The location was described as including a quiet street, a cul-de-sac, proximity to schools, shops, work or university, and public transport.

If I'm looking for family [as tenants], it would be location, schools ... So we're over near the parks, but it's still near transport, schools, all of that, close to the city... (Investor focus group, Brisbane, 18/9/14)

Natural features were also mentioned as part of the location, including distance to the beach. Furthermore, familiarity with the location was important to some:

I was just looking like around my parent's suburb, that's a good area (Investor focus group, NSW Central Coast, 10/9/14)

The age and quality of the building were identified as the second priority for investors. They considered that their tenants would be attracted to a renovated kitchen and bathroom, fresh paint, and polished floorboards. In addition to attracting tenants, investors considered that the quality and age of the building would affect maintenance costs:

I would [seek a property] that's in ... reasonable condition and looks to be low maintenance. (Investor focus group, Sydney, 9/9/14)

The third priority when purchasing an investment home was the potential rental return from tenants:

The [tenants] could be in the ugliest building, but as long as I'm going to get the rent that I want to get for it, I don't really care what it looks like. (Investor focus group, Brisbane, 18/9/14)

Growth in your capital investment, that's important to me ... do a bit of research to look which suburbs are growing. (Investor focus group, Sydney, 9/9/14)

Investors also listed three additional priorities when purchasing an investment property. One was installed features, such as quality cooking appliances. A housing design that maximised natural lighting was also listed as important:

I love natural lighting ... plus you've got the benefits and less energy. (Investor focus group, Sydney, 9/9/14)

Finally, a couple of investors identified that building managers are a priority for an investment property:

I want something [where] ... the manager can be in there managing it, so I don't have to go there. (Investor focus group, Brisbane, 18/9/14)

TENANTS

Similar to the other participant types, the tenant focus group participants identified location as their priority when selecting a home to rent. Favourable location features including proximity to public transport, work, schools, as well as proximity to family and friends:

[I consider] how can I get to work easily? Do I have to take a car? Where do I park? So there is all that big monetary factor for me, as well, especially now you've got to pay everywhere to park. So it was location. (Tenant focus group, Canberra, 8/9/14)

Yeah, sort of like a comfort thing, isn't it? You don't want to be too far. Not just your Mum but your friends. And work as well- I don't want to drive too far. (Tenant focus group, Sydney, 9/9/14)

The second priority for tenants was natural light. This was mentioned by participants from all four locations as providing a feeling of spaciousness, views, as well as reducing the need for lighting:

I love that fresh air and that sort of thing, so lots of windows, big balcony. (Tenant focus group, Brisbane, 18/9/14)

That place was extremely well lit and there was no power on, so that's what I wanted. (Tenant focus group, NSW Central Coast, 10/9/14)

Building age and quality was identified by tenants as the equal third priority for selection of their home. There was a preference for new buildings, or newly renovated kitchen and bathroom areas. This was a priority for hygiene, functionality as well as the 'feeling' provided by the 'newness':

[If] it's brand new, it's got a nice feel, it's like when you buy a new car it's got that new smell, it makes you feel good. (Tenant focus group, Brisbane, 18/9/14)

The equal third priority was having sufficient heating and cooling devices installed, and ideally also gas installed for cooking. For those in Brisbane, the emphasis was on air-conditioning and ceiling fans for cooling. For tenants in Canberra, this priority emphasised heating devices, especially central heating:

Both of these had ducted heating and cooling, but then we thought, okay, well this one is cosier, it's carpet throughout the house. (Tenant focus group, Canberra, 8/9/14)

The tenant focus groups listed many more additional priority features than the other two types of participants. This included adequate floor space for the size of family and guests; installed features, including a clothesline in sufficient sun, carpets, and fences for pets and small children; an affordable rental price, and approachable people with whom engagement is required- notably neighbours and the managing agent:

[My priority] is generally ... what the owner's like. For instance, if they have a maintenance issue or they'll fix things that are wrong and stuff like that. ... And just make sure they're not going to sell the property ... that's what I tend to ask and worry about. (Tenant focus group, Brisbane, 18/9/14)

Property market and availability

- The current property market is a landlords' market in the southern cities and region, and a tenants' market in Brisbane. This affected the range of choice that tenants had in terms of property features.

One key influence on the above property selection priorities was the property market, and whether the buyer or tenant could actually secure the desired priority features within their intended budget. During the discussions, focus group participants in each location described the market conditions in which they were buying or renting a home. These differed markedly, especially for those seeking rental properties – from a landlords' market in the southern cities and

region, and to a tenants' market in Brisbane. This affected the range of choice that tenants had in terms of property features.

In Canberra, the rental market was described by most long-term Canberra tenants as very expensive:

I saw a house when we were looking for \$350 a week. It was a three-bedroom house, and immediately I said, "What's wrong with it?" Because you cannot rent a house for \$350. (Tenant focus group, Canberra, 8/9/14)

However, participants who had moved to Canberra from more expensive cities, such as Sydney, considered that they had more choice for the same amount:

I was just going to say, my experience have been very different, given I've only moved to Canberra about three months ago. So coming from the Sydney rental market, to Canberra, what I was paying for a two-bedroom unit on the third floor, [here I can get] a town house with three bedroom and three bathrooms. (Tenant focus group, Canberra, 8/9/14)

Several described this availability and value for money as due to the increase in new builds, providing them with a 'tenants' market with significant choice and value.

The Sydney rental market was described as the tightest of all, with tenants explaining that very few of their priority features were included as they had little choice:

Right now it is just a battleground and you're fighting your way just to get through the door and get noticed by the agent, let alone being picky about what sort of property it is. (Tenant focus group, Sydney, 9/9/14)

The Brisbane market was described by the tenant focus group as a tenants' market, as the current low interest rates and significant construction on new apartment buildings had resulted in an oversupply of new apartments on the rental market:

Because interest rates are low ... everyone is buying right now. It means there's a lot available to rent. So it's really good for the tenants. (Tenant focus group, Brisbane, 18/9/14)

I go onto realestate.com nearly every day, just to see what's on there, and there's a bunch of good units ... there is so many units available that it's not funny. And they are offering, especially on units, one week rent free, a \$200 travel voucher, and stuff like that. (Tenant focus group, Brisbane, 18/9/14)

Similar to the Sydney market, the tenant focus group on the NSW Central Coast had experienced a very limited and competitive market. This restricted the choice of features or priorities that they had otherwise hoped to secure:

Every time you turn up to a house inspection, there's 30 other couples in the same position as you are. They're not better than you; they're not financially better off, or better rental history. ... it's just there is a lack of rentals on the Central Coast and it is just by luck or if you strike up a relationship with the person who's renting the property, and they happen to like you and they accept your application; that's about it. (Tenant focus group, NSW Central Coast, 10/9/14)

There was so many people ... We didn't have a choice; we just had to take it. (Tenant focus group, NSW Central Coast, 10/9/14)

Energy Efficiency Attitudes, Perceptions and Knowledge

This section provides an overview of the attitudes, perceptions and knowledge held by participants. This section initially provides environmental attitudes and attitudes towards energy of the individual participants and then expands to present perception of home comfort, of energy costs and of energy efficient or sustainable homes. Finally, it explores knowledge of specific energy efficiency features, and of appliance energy ratings.

Attitudes towards the environment and energy security

- Participants believed that climate change and the depletion of energy resources are a problem for society and that energy saving helps reduce climate change.

To understand the pro-environmental beliefs and energy security concerns of participants, the survey explored participants' level of agreement with a range of statements. Table 4 shows that, in general, participants that attended the focus groups believe that climate change and the depletion of energy resources are a problem for society and that 'energy saving helps reduce climate change'. Responses to other statements are presented in later sections of this report.

Table 4 Attitudes towards climate change

	N	Mean	Standard deviation
Climate change is a problem for society	105	4.08	0.958
Energy saving helps reduce climate change	107	4.02	0.858
The depletion of energy resources is a problem for society	106	4.08	0.927

Likert scale from 1 'strongly disagree' to 5 'strongly agree'

In terms of energy security, Table 5 shows that participants are somewhat concerned that electricity and gas will become unaffordable to them and that there will be more frequent power outages. For both sets of questions, there was no identified difference between groups. These questions assisted to provide further context to the participants, noting that attitudes do not necessarily or directly translate into behaviour.

Table 5 Attitudes towards energy security

	N	Mean	Standard deviation
Are you concerned that, in the next 10-20 years, electricity and gas will become unaffordable for you?	106	3.58	1.145
Are you concerned that, in the next 10-20 years, there will be more frequent power outages?	106	3.13	1.196

Likert scale from 1 'not at all' to 5 'very much so'

Perceptions of home comfort

- Most participants agreed with the statements that 'a comfortable home is naturally warm in winter and cool in summer' and that 'a comfortable home has good natural light'.
- The majority of participants considered comfort to be about temperature, where extreme heat and cold were minimised. The most cited personal experience of discomfort was a lack of insulation.
- Participants perceived that an energy efficient home would require 'sacrifice' of heat or cold, or of quality of life.

In terms of perceptions and how these affect adoption of energy efficiency measures, the survey explored perceptions of home comfort. As shown in Table 6, most participants agreed that 'a comfortable home is naturally warm in winter and cool in summer' and that 'a comfortable home has good natural light'.

Table 6 Perceptions of home comfort

	N	Mean	Standard deviation
A comfortable home is naturally warm in winter and cool in summer	107	4.38	0.709
A comfortable home has good natural light	107	4.32	0.958

Likert scale from 1 'strongly disagree' to 5 'strongly agree'

This finding was supported in the participants' survey responses to list unprompted features of a comfortable home. Some features mentioned were directly associated with energy efficient homes (such as thermal efficiency; natural light and airy) while others were not (home location; amenities and outdoor-space). Results are shown in Table 7. Of the four types of comfort (visual, acoustic, thermal conditions, and air quality), thermal conditions was the most cited aspect of comfort with 61% of participants citing at least one thermal topic such as 'home that is warm in summer and cool in winter' or a 'home that has an air-conditioner'. This was followed by visual aspects with 32% of participants identifying aspects such as 'natural light' and 'sunny position' as features of a comfortable home. In addition, 11% of participants identified air quality aspects such as 'airy', 'good airflow' and 'lots of windows' as aspects of comfortable homes. Acoustic aspects were not directly associated with energy efficient features as the 8% of participants which identified acoustic benefits cited benefits such as 'quiet street' or 'isolation from noisy neighbours'. Other aspects that are directly associated with energy efficient products/homes included: furnishings (i.e. 'carpets' and 'curtains'), efficient use of space (i.e. no wasted space), energy efficiency (i.e. 'high energy rating', 'efficient heating and cooling') and cost-effectiveness (i.e. 'save power', 'cost-effective heating and cooling').

Table 7 Participants' perceptions of a comfortable home

Aspects mentioned by participants of what constitutes a comfortable home	Frequency	Percentage of sample (%)
Directly associated with energy efficient products/homes		
Thermal (e.g. warm in summer/cool in winter; air-conditioner)	65	60.8
Visual (e.g. natural light/sunny position)	34	31.8
Furnishings (e.g. carpet; curtains)	16	15.0
Air quality (e.g. airy, good airflow, lots of windows)	12	11.2
Efficient use of space (i.e. no wasted space; not too big)	9	8.4
Energy-efficient (e.g. energy rating, efficient heating and cooling)	6	5.6
Cost-effective (e.g. save power, cost-effective heating and cooling)	3	2.8
Not directly associated with energy efficient products/homes		
Space (i.e. spacious/big house)	53	49.5
Amenities (within home, e.g. swimming pool; ensuite)	21	19.6
Location (e.g. close to amenities)	16	15.0
Safety (i.e. safety and security features)	15	14.0
Furniture (e.g. comfy lounges, beautiful furniture)	15	14.0
Outdoor-space (e.g. backyard, balcony, vegetable garden)	15	14.0
Low-maintenance (home and/or yard)	10	9.4
Acoustic (e.g. quiet street; isolation from noisy neighbours)	9	8.4
Transport (i.e. close to public transport)	7	6.5
Functional (i.e. well laid out plan, functional design)	5	4.7
Good-condition (e.g. not crumbling down or worn, liveable)	5	4.7
Decoration (e.g. well decorated, modern touch)	5	4.7
Easy access (e.g. not in a hill)	2	1.9

The terms offered by participants in the survey responses when describing a comfortable home are displayed in a 'word cloud' in Figure 3. As can be seen, words referring to thermal aspects such as 'warm', 'cooling' and 'heating' were frequently used and therefore are presented in larger font, as well as words describing visual aspects such as 'light' and 'natural'.



Figure 3 Word cloud of terms used to describe a comfortable home (with number of citations)

The survey responses were supported during the focus group discussions, where participants were asked to define what they meant by 'comfort'. There were two main splits on how comfort was defined. The minority of participants described comfort in terms of spaciousness and renovated features. However, the majority of participants considered comfort to be about temperature, where extreme heat and cold were minimised:

Something that is comfortable to come home to, [is] where it can stand up to the heat of summer and the cold of winter (Owner occupier focus group, Sydney, 9/9/14)

I found the [house] that was carpeted a hell of a lot warmer in winter. Yeah, like, it was really noticeable. It was a lot more comfortable. (Investor focus group, Brisbane, 18/9/14)

It is not comfortable at all. It's cold - it's really icy cold. ... [when] winter came around, it just went from five stars to not even one. (Tenant focus group, Canberra, 8/9/14)

Although air-conditioning was an option offered by participants to provide the heat or warmth for comfort, several respondents described their dislike of climate-controlled rooms:

It's not natural air. I don't sleep well with air-conditioning, because it's so dry. ... It messes you up a bit. (Investor focus group, Brisbane, 18/9/14)

To be in a house that's just comfortable all the time and not to have that fake air-conditioning or that fake heating, it's just so much more comfortable. (Investor focus group, Canberra, 8/9/14)

In the survey, 73-76% of the focus group participants disagreed with the statement 'Improving the energy efficiency of my home means I have to live less comfortably'. However, during the discussion of energy behaviour to achieve comfort,

a perception was expressed commonly that an energy efficient home would require 'sacrifice' of heat or cold, or of quality of life became apparent:

I can save as much money as I want by turning my lights off and not using the power but I'm not going to have much of a life if I sit at home in the dark for two hours and don't do anything. (Owner occupier focus group, Canberra, 8/9/14)

You do have to sacrifice some of [comfort] to be energy efficient. (Owner occupier focus group, Canberra, 8/9/14)

Despite this, participants also readily described features that would enhance their comfort or decrease their discomfort without suggesting that this comfort was provided by energy efficiency measures. The most cited personal experience of discomfort was a lack of insulation. Owners, investors and tenants from all four locations described the discomfort of an uninsulated home:

For us, ... I would be looking at that insulation ... we barely need to use our air-conditioning, we've had no heating turned on during the day. (Owner occupier focus group, NSW Central Coast, 10/9/14)

My place is old, the one I live in now, and it's freezing in winter and boils in the summer. And I just don't think there is any insulation in it at all. I would not go for an older place again. (Tenant focus group, Sydney, 9/9/14)

The other most-mentioned feature of an uncomfortable home was inadequate floor coverings to ensure warmth in winter:

The flat I lived in didn't have carpet ... they can get very cold during winter. (Tenant focus group, Canberra, 8/9/14)

I've just moved from a house that was tiles throughout the whole house. Our electricity bill was like 950 bucks. It was freezing cold. Like, freezing, freezing cold, it was 12 degrees colder inside in the morning to what it was outside. Now we're in a place with carpets and it's unbelievable, it is so warm. (Tenant focus group, Sydney, 9/9/14)

More specifically, the survey asked participants whether their home was too hot or cold without artificial cooling and heating. Responses depended on participants' climatic zone, with more than two-thirds of Canberra residents stating that their home is too cold in winter without heating. Most participants in the NSW Central Coast and in Sydney also believe that their homes are too cold in winter without heating. On the other hand, half of Canberra participants also stated that their homes are too hot in summer without air-conditioning. A large number of Sydney residents (40%) also believed that their homes are too hot in summer without air-conditioning. Understanding how householders perceive their home energy needs is essential to design and deliver information that meets users' needs. The findings are displayed in Figure 4.

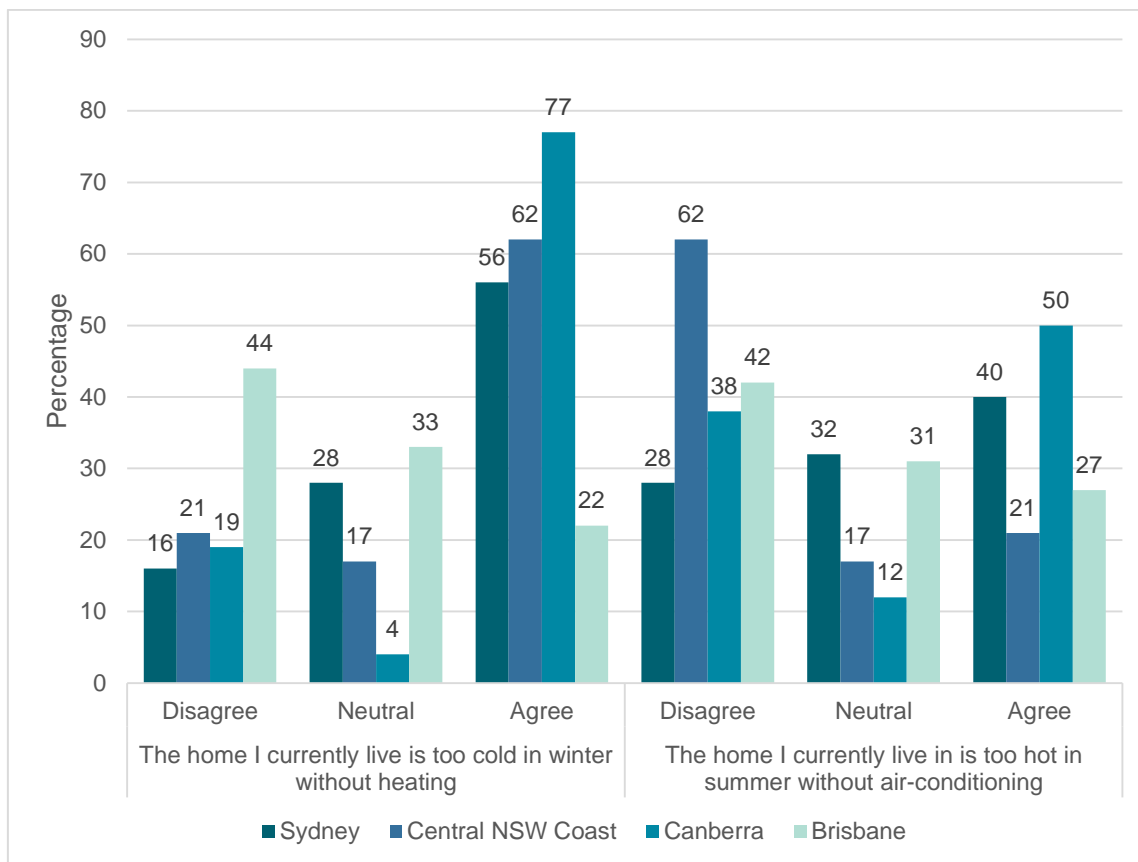


Figure 4 Frequency responses regarding home cooling and heating needs

Perceptions of energy efficient and sustainable homes

- Most participants stated that rooftop solar PV was a key feature of an energy efficient home, reflecting a misunderstanding of how an energy source contributes to efficient use.
- The second most cited aspect of an energy efficient home was energy efficient lighting (29%), followed by insulation (24%).
- An 'energy efficient home' was a term that provided the most clarity to participants, and offered them a more defined scope of a home with installed features that ensured a more efficient and less costly consumption of energy.

To initially explore how participants construct the notion of an energy efficient home, the survey asked participants to write down what comes to their mind when they think of a home that is energy efficient. Just over half of the participants (55%) cited solar energy, indicating that there is a strong view within the community that what makes a home energy efficient is its energy source. This response reflects a misunderstanding of energy efficiency by participants, as while solar energy will reduce the home carbon emissions, it is unlikely to reduce the amount of energy consumed within the household especially if solar is used for electricity generation. The second most cited association of energy efficiency in the home was energy efficient lighting (29%), followed by insulation (24%). Energy efficient appliances were cited by 21% of focus group participants, followed by the concept that actions can achieve lower energy costs (e.g. of bills; 17%), natural light (14%), passive design (12%) and water tanks (11%). Table 8 shows the complete list of aspects that were mentioned by two or more participants.

Table 8 Participants' perception of an energy efficiency home

Aspects mentioned by participants of what constitutes an energy efficient home	Frequency	Percentage (%)
Solar energy (e.g. solar panels; solar power; solar hot water)	59	55
EE lighting (e.g. LED; energy saving lights sensor lights)	31	29
Insulation (e.g. best insulation; insulated walls and ceilings)	26	24
EE appliances (e.g. power saving appliances; appliances with high star ratings)	22	21
Low cost (e.g. cost effective; low bills; cut down costs)	18	17
Natural light (e.g. optimise natural lighting; good light)	15	14
Passive design (e.g. cool in summer/warm in winter; no heating/cooling required)	13	12
Water tanks	12	11
Double-glazing	10	9
EE technology (e.g. power saving fixtures; low energy fixtures)	9	8
Gas	9	8
Energy efficient (e.g. low environmental footprint; better for the environment)	8	7
North-facing	8	7
Water efficient	8	7
Windows (e.g. large windows; windows positioning)	6	6
Energy monitor	5	5
Draught-proof	4	4
Window coverings (e.g. heavy curtains)	4	4
Airflow	3	3
Clothes line	3	3
EE behaviour	3	3
Energy efficient	3	3
Energy rating	3	3
Green	3	3
Grey water	3	3
Modern	3	3
Renewable energy	3	3
Heating	2	2
No wastage (e.g. not wasting any energy)	2	2
Recycled water	2	2
Solar heating	2	2

Figure 5 shows a word cloud of terms provided in the survey responses by participants to describe an energy efficient home. Words referring to energy sources such as 'solar', 'panels', 'power', 'gas' and 'electricity' were most frequently used and are displayed in a proportionately larger font, as well as words describing other natural resources such as 'light', 'water' and 'natural'. Materials related to home construction cited included 'insulation', 'windows' and 'tanks' as well as home appliances such as 'appliances', 'heating', 'cooling', 'bulbs'. Words related to monetary costs mentioned include 'saving', 'bills', and 'cost'.

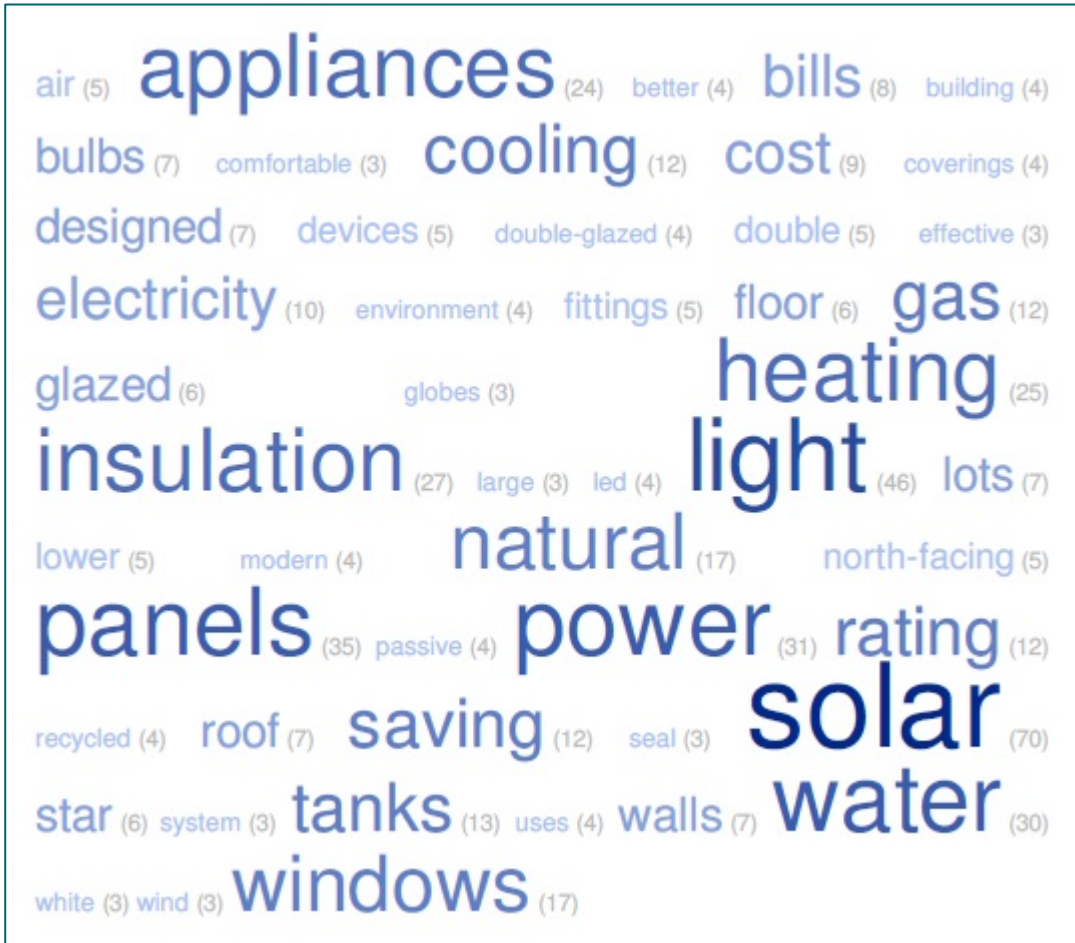


Figure 5 Word cloud of terms used to describe an energy efficient home (with number of citations)

During the focus group discussions, participants' were asked to share their perceptions of homes that could be described by the terms 'sustainable', 'eco', 'environmentally-friendly' and 'energy efficient'. A diversity of views was shared. In general, a sustainable home was seen as a holistic term incorporating a wider area than the house, to perhaps include the surrounding garden and bushland, and the life cycle impact of the building materials and contents. Sustainability was considered to refer to a wide range of aspects, from the building materials used and water efficiency of a home, to having a sustainable lifestyle and growing vegetables.

The sustainability of something means that you're reusing materials if possible, so recycling, and all that sort of stuff... whereas energy efficient means that you're changing one type of – say, for instance, the light bulb as an example to a different product to make it more energy efficient, so I think that they are different in my understanding. (Owner-occupier focus group, Brisbane, 18/9/14)

it's self-efficient in that respect...people growing vegies in their backyard, it's a sustainable household, not just a sustainable house. (Investor focus group, Canberra, 8/9/14)

A home that can look after itself while protecting the environment around it. (Investor focus group, Sydney, 9/9/14)

An eco or environmentally-friendly was not seen as having a clear enough definition, and thus being a more vague description. An energy efficient home was a term that provided the most clarity to participants, and offered them a more defined scope, with most describing such a home as one that had installed features that ensured a more efficient and less costly consumption of energy.

Despite the differences commonly described, some participants felt that the terms were interlinked, in that energy efficiency could be considered as part of sustainability. This understanding is demonstrated in the quotes below:

...it's like sustainable is the overarching umbrella, and energy efficiency is just underneath it. (Tenant focus group, Canberra, 8/9/14)

...you wouldn't be living in a sustainable home and keeping recycled product and then be non-energy-efficient. (Tenant focus group, Sydney, 9/9/14)

The specific attributes or features that participants associated with the concept of energy efficient and/or sustainable homes were diverse. Solar panels were mentioned frequently and across the majority of focus groups. Description of natural lighting and insulation was common. Other features mentioned included energy efficient appliances and LED lights:

I would say solar power is the first thing I think of. Although I don't have it, yeah, it's the first thing I think of for an energy efficient house. (Owner occupier focus group, Brisbane, 18/9/14)

Energy efficient appliances that you buy for your home. (Owner occupier focus group, Gosford, 10/9/14)

When respondents were presented with several images of different housing types participants nominated additional features, including: skylights, the number and size of windows, double glazing of windows, internal and external window coverings, double-brick construction, combustion fireplaces, roofing materials and 'whirlybirds'.

One of the topics that arose during several of the focus group discussions was the age of buildings and the perceived impact this would have on energy efficiency. The views expressed by participants were varied. Some participants expected newly built homes would be more energy efficient, with insulation as a standard feature and the installation of more efficient technologies. Examples of these comments are listed below.

They have gas tanks already...the ceiling fans might be more energy efficient, all the appliances in there might be more energy efficient. (Investor focus group, Brisbane, 18/9/14)

I think if you buy a new house you expect it to be energy efficient. If you buy an old house, you assume that it's not energy efficient. (Owner occupier focus group Canberra, 8/9/14)

My place is old, the one I live in now, and it's freezing in winter and boils in the summer. And I just don't think there is any insulation in it at all. I would not go for an older place again. (Tenant focus group, Sydney, 9/9/14)

Other participants thought traditional designs, such as Queenslanders, were made to suit the climate and were more efficient as result:

...an original Queenslander with wide verandas, louvres, fans, big doors, big windows, to let the air flow through and what have you. So to me it's like, when I think of energy efficiency, it's going back in time. (Investor focus group, Brisbane, 18/9/14)

Energy related behaviour was a prominent theme in participants' understanding of energy efficiency. Participants recognised that the behaviour of a household's residents would impact upon its overall efficiency.

I think more along the lines of how else can we reduce the energy that we use as well, so we don't necessarily have to have the air-con...or heaters on during winter if we can rug up... (Owner occupier focus group, Brisbane, 18/9/14)

...but if your behaviour's all wrong in terms of leaving lights on or doors open or stuff like that, that's got as much impact on the energy efficiency.(Investor focus group, Canberra, 8/9/14)

Perception of rooftop solar photovoltaics

As outlined above, when asked for their first thoughts on what a sustainable or energy efficient home might look like, rooftop solar photovoltaic (PV) panels were volunteered in each focus group. Solar PV does not technically contribute or result in energy efficiency a fact not realised by any of the focus group participants. From the survey, only three focus group participants reported they had solar PV systems installed at home. The reasons for installing the system included to benefit from government rebates (n=2) and save money on the power bill (n=1). Details of the three installed solar PV systems are provided in A.4. Despite participants people incorrectly linking the two concepts of energy efficiency and solar, achieving energy efficiency was not articulated as a factor in the choice for solar PV, but rather selected for price and incentives.

The financial benefits of rooftop solar were the main reason offered by focus group participants for their positive perception of solar, especially with the significant government rebates that were offered under the previous Federal Government. Even with the subsidy now closed, one participant was very positive about the technology and the financial impacts it had created on their bill:

We've just moved into a house ... It has 16 panels on it. Now, I didn't get the 44 cents that the [original owner

received]... it [was] knocked down to 10 cents. ... [but] my first bill was \$126. (Investor focus group, Brisbane, 18/9/14)

Another participant had installed rooftop solar, but had sold his house prior to recouping the costs. He considered that the solar installation had not increased the sales price for a house in his suburb, but had provided an additional 'selling point':

INTERVIEWER: *Did the solar add to the sale price?*

RESPONDENT: *Not really. ... I mean, it was a selling point. There are solar panels there; he mentioned it in the advertising, but I don't think it made a difference to the final figure. (Owner occupier focus group, Sydney, 9/9/14)*

Despite the positive perspectives on solar PV, there were several perceived barriers raised by participants. These included the high upfront costs now that the subsidy program has closed, aesthetic concerns, where solar PV is considered by some participants as too 'ugly' on the street frontage of their home, and too much shade from overhanging trees and surrounding bushland on the roof. Once installed, an additional barrier identified was a lack of understanding of how to maximise use of the solar-generated electricity in order to use the electricity during peak generation, resulting in reduced bills:

I don't think a lot of people realise how to use them ... I didn't know much about these panels, so I went online and researched them, about making sure, you're doing washing during the day when there is daylight, and all this sort of stuff. (Investor focus group, Brisbane, 18/9/14)

Investor focus group participants were asked whether they would consider installing rooftop solar on their investment properties. None of these participants had installed solar on those properties as they considered they would not personally gain the benefit, and may in fact be responsible for additional repair and maintenance costs:

We didn't go down the solar route with the [investment property]... but it doesn't give the advantage to us ... I'm just sort of thinking in a purely business sense that I wouldn't get it back from a rental property. (Investor focus group, Brisbane, 18/9/14)

So if you put solar panels on an investment property it's a massive outlay for something you don't get back, but it's also something else to fix when it breaks. ... it's just an unexpected bill out of nowhere, it's not worth it. (Investor focus group, Brisbane, 18/9/14)

Knowledge and use of energy efficient features

- Participants identified that most (63%) had installed shutters/blinds and/or curtains (57%), and one quarter had installed ceiling insulation (49%), reverse-cycle air-conditioner (44%), wall insulation (30%), modifying house orientation (29%) and ceiling fans (29%).

In terms of knowledge regarding energy efficient features, the survey found tenants seemed less sure than owner occupiers or investors about how to improve their home energy efficiency. Despite this higher knowledge, the majority of owner occupiers (85%) disagreed that it is too much of a hassle to improve their property's energy efficiency. These findings are displayed in Appendix A.5.

To understand the level of energy efficiency features that are already in homes, the surveys completed by home buyers only (owner occupiers and investors) reported which energy efficient features from a set list of options were installed in their home. This question was not asked to tenant participants as only significant installed or renovated features were explored which would usually require landlord permission and finance. Table 9 displays the number of participants who selected each of the features. Most participants (63%) had installed shutters/blinds and/or curtains (57%). Other energy efficient features installed by at least one quarter of participants included ceiling insulation (49%), reverse-cycle air-conditioner (44%), wall insulation (30%), modifying house orientation (29%) and ceiling fans (29%).

Table 9 Features that participants have installed in their homes*

	Frequency	Percentage (%)
Internal blinds or shutters	44	62.9
Curtains	39	55.7
Ceiling insulation	34	48.6
Reverse-cycle air-conditioner	31	44.3
Wall insulation	21	30.0
House orientation (e.g. North/East aspect)	20	28.6
Ceiling fan	20	28.6
Ducted air-conditioner	16	22.9
Rooftop solar panels	15	21.4
Draught proof doors	14	20.0
External blinds, shutters or awnings	14	20.0
Floor insulation	12	17.1
Draught proof windows	11	15.7
Double glaze windows	9	12.9
Central heating	7	10.0
Fireplace	6	8.6
Tinted windows	2	2.9
None of the above	9	12.9
Others specified	3	4.3
➤ Home automation	1	1.4
➤ Hot water heat pump	1	1.4
➤ Water tanks	1	1.4

* Note: This question was not included in the tenants' survey

Awareness and use of appliance ratings

- Two-thirds of participants stated that they consider energy efficiency rating 'most of the time' or 'always' when buying new appliances.
- Many participants stated that the energy rating sticker was the main influence behind their purchase choice.

The energy efficiency ratings of appliances were specifically explored in the survey. Over two-thirds of participants stated that they consider energy efficiency rating 'most of the time' or 'always' when buying new appliances. Investors (40%) were more likely to 'always' consider energy efficient ratings when compared to tenants (16%) and owner occupiers (21%). The findings are provided in Appendix A.5.

During the discussion, focus group participants were asked whether they consider the energy star ratings of appliances that they installed or plugged into their homes, displayed by a yellow and red 'star' sticker. There was a high awareness of this rating amongst all participant types and locations, and many participants stated that the energy rating sticker was the main influence behind their purchase choice:

When I'm buying household appliances, so even like dishwashers, washing machines, I always look at the star rating and that really influences whether or not I buy it. (Investor focus group, Brisbane, 18/9/14)

A couple of years ago I didn't much – I didn't care. ...[Now] if there's one star I won't buy it. As simple as that. It's got to have at least a few stars. (Tenant focus group, Sydney, 9/9/14)

The main motivation for purchasing energy efficient appliances was to save money over the longer term on energy costs:
The energy efficiency rating is important to me when I'm buying washing machines, dryers or televisions because those things in my house suck power like there's no tomorrow. (Tenant focus group, NSW Central Coast, 10/9/14)

Although there was strong support stated for energy efficient appliances, there were concerns about how the ratings were calculated and the changes that had been made to the rating system in recent years:

When you're comparing dishwashers, you have to compare the stars with other dishwashers. You can't really say four stars on an oven means better than two stars on a refrigerator... (Tenant focus group, Canberra, 8/9/14)

Because the stickers have changed, you shouldn't look at the stars. It's the numbers that you look at. (Investor focus group, NSW Central Coast, 10/9/14)

Rating Tools, Information and Influences

Focus group participants were asked to discuss the sources of information and influences on which they relied for information regarding housing and residential energy use, and their impressions of these sources. The first sub-section provides perceptions and level of understanding of three home energy rating tools and information system, including one currently in use in the Australian Capital Territory (ACT). The second sub-section provides the range of information sources on which owners, investors and tenants separately rely upon to inform their housing and energy decisions. A sub-section on building regulation provides views on how influential these requirements are in terms of energy efficiency. The relationship between landlords and tenants is then considered in terms of how this affects opportunities for energy efficiency.

Perceptions of energy rating tools and information systems

- Participants liked the comparative energy display as it was colourful, clear and used familiar info graphics, but they did not trust the assumptions.
- Participants found the colours of the thermoimage of heatbleed counterintuitive.
- The Energy Efficiency Rating from the ACT was favoured for using the familiar energy star rating and providing advice for energy improvements, but was considered to be limited in the method and the rating did not reflect comfort or cost.

Focus group participants were asked to review three specific images that illustrated the energy use of a property that they could potentially buy or rent. The images are provided in Appendix A.3. The combined findings are presented for each image. A summary of the perceptions is provided in Table 10, and further details are provided in the sub-sections below.

Table 10 Perceptions of three energy rating tools and information systems

Tool/ System	Likes	Dislikes
Comparative energy display	<ul style="list-style-type: none"> • Bright and colourful • Easy to follow • Familiarity with column graphs 	<ul style="list-style-type: none"> • Low trust in accuracy of the calculations regarding average consumption and in sample size • Neglects to incorporate effect of energy behaviour
Thermoimage of heat bleed	<ul style="list-style-type: none"> • Heat bleed concept is clever • Familiarity with thermoimaging from pest inspections 	<ul style="list-style-type: none"> • Heat bleed concept hard to understand / counterintuitive: • blue = cold = unpleasant = maybe the house is empty, people are dead etc • red = warm and cosy
ACT EER Certificate	<ul style="list-style-type: none"> • Familiarity with star ratings from appliances • Provides tips/advice on potential energy improvements • Could be beneficial if cheap and done by an independent certifier (similar to pest and building inspector) 	<ul style="list-style-type: none"> • Is a limited checklist, and additional features cannot be considered if they are not included on the checklist • ACT residents with experience of EER concerned it is susceptible to manipulation and number of stars is not an accurate guide to comfort/bills

COMPARATIVE ENERGY DISPLAY

Participant responses to the 'MyAGL IQ' were initially positive to the layout and communication style. Participants from across all locations and types commented on the colours, the comparative layout, the clear communication style that made it easy to read, and the helpful tips to reduce energy consumption:

It makes it easy to make a comparison. It's only a general comparison, but, it's easy to visualise then how it fits in with similar houses. I'm going to go home and have a look at mine, see where it fits in. (Owner occupier focus group, NSW Central Coast, 10/9/14)

However, the discussion quickly began to unpack the method and assumptions that were behind this info-graphic. Three main criticisms were offered. The first was that the image displayed the energy consumption behaviour of the previous residents, which may differ to the new residents:

I think it's very difficult, because it depends on what else you use in the home ... everyone uses power differently. ...it doesn't tell you until you move in and you work the house yourself. (Tenant focus group, Brisbane, 18/9/14)

The second concern raised was that the sample size may be limited, and therefore the comparison may be limited:

It's only on AGL, so if they've only got three houses in the area they base it on three people...So they're getting just AGL customers and not everyone. (Owner occupier focus group, Brisbane, 18/9/14)

The final concern raised by focus group participants with this image was that the communication was based on usage (in kilowatt hours), rather than based on cost - which was perceived to be more influential:

The usage charge because if you see it in dollar figures as opposed to usage...So it's using more power but how much does that cost? (Owner occupier focus group, Brisbane, 18/9/14)

Despite their concerns about the assumptions behind this information, participants did consider that the presentation of this comparative information was powerful:

I'd be saying, "Whoa! Maybe I shouldn't be really looking at this one". (Owner occupier focus group, Brisbane, 18/9/14)

Others considered that this information, while interesting, would not influence their ultimate decision to buy or rent.

Whether I would use it to buy a home? ...don't think so. (Owner occupier focus group, Sydney, 9/9/14)

THERMOIMAGE OF HEAT BLEED

When asked to review the thermoimage of terrace homes that displayed different levels of 'heat bleed', participants held a range of concerns about the communication efficacy of this image. Firstly, the colours were seen as misleading. The 'blue' energy efficient home was perceived as uninviting:

It looks like a very cold home to me. The others are warm and inviting ... It looks scary, doesn't it? Haunted. (Owner occupier focus group, Sydney, 9/9/14)

Secondly, participants sought further information about whether there was a 'level playing field' against which all the houses in the terrace row could be compared. They considered that the 'blue' energy efficient home differed so significantly to the other homes that it appeared suspicious. Participants suggested that the residents were not home/on holidays/dead/preferred not to heat their home:

There's so many other factors [that could affect this image] - like these people [in the blue house] mightn't like their house as hot as these folks. They might have their air-conditioning turned up really, really hot. Definitely you're going to get more leakage [in a heated house] than someone who likes a cold house. (Owner occupier focus group, NSW Central Coast, 10/9/14)

Participants recommended that this image should only be provided if there were controlled conditions for all homes being photographed in this manner, such as taken at the same time of day, in the same season and with all heating devices turned on.

Only one participant was positively enthusiastic about this method of communication:

I love it. I've been doing a lot of research on windows at the moment...if I was going to sell my house, with spending that sort of money on an initiative [for airtight windows], I'd want to make sure that it wasn't losing heat, or letting heat in, it wasn't a hot building. So for me that would be great. I already do my pest control through imaging like this. (Investor focus group, Brisbane, 18/9/14)

Other participants considered the thermoimage to be a 'gimmick' or too difficult to understand. Other participants considered that they may only consider the image during their decision-making if it were combined with other energy information and additional context.

A picture [alone] is definitely not going to persuade me [to buy a house]... (Owner occupier focus group, NSW Central Coast, 10/9/14)

ENERGY EFFICIENCY RATING CERTIFICATE

The final image provided to focus group participants was a copy of an Energy Efficiency Rating (EER) certificate currently issued in the ACT. This certificate was a new concept to the focus group participants outside of Canberra. For them, there was a generally positive consideration of the concept, and it was discussed in a hypothetical manner. These views are presented first. The latter section provides the views of Canberra focus group participants who are familiar with the EER certificates, and a more critical of the current system.

The initial impressions of EER by focus group participants from Sydney, Brisbane and the NSW Central Coast were very positive. They appreciated the use of the star rating, as this was familiar to them from the similar system used for appliance energy ratings:

It would probably look like your thing on the stickers on all your appliances ... Everyone knows what that means. (Tenant focus group, Brisbane, 18/9/14)

These participants commented positively on the inclusion of the major appliances used for hot water, heating and cooking, and appreciated the explanatory information on the reverse side of the certificate, and the identification of potential improvements to increase the energy efficiency:

So it tells you actually what you can do to increase it pretty efficiently. I like that. (Investor focus group, NSW Central Coast, 10/9/14)

Despite this enthusiasm, some participants were very sceptical about the validity of the certification of the EERs:

How do you know it's true? How do you [know] they just didn't dodgy it up? ... I'm always sceptical about this too. It depends who's signed. (Tenant focus group, Brisbane, 18/9/14)

Part of this scepticism was based on a system 'coming out of Canberra' that might not be relevant in other climatic zones:

Is that someone from Canberra saying how efficient is my home in Brisbane, but has never actually been here? ... The methodology behind it is pretty weak. ... The whole [climatic zone] is so variable, ... what's good down in Canberra, that's going to be bloody rubbish up in Cairns. (Investor focus group, Brisbane, 18/9/14)

This scepticism was also based on the example that some of the participants viewed, which had secured an energy rating, but two of the main appliances were unknown.

If they don't know some of the features, things that sap energy, how the hell can they say, three stars? (Investor focus group, Brisbane, 18/9/14)

The Sydney, Brisbane and NSW Central Coast focus group participants were asked whether the EER would influence their decision to purchase or rent a home. Some felt that an EER (or equivalent) would influence their decision:

It could actually change [a purchasing decision]... someone might go, "well, I'd rather get that house that has got [a high EER] rather than the house that doesn't" (Owner occupier focus group, Sydney, 9/9/14)

If ... I could get something that was \$30 less[rent per week] that's got a good rating to one that's dearer and got a less rating, that would only help. (Tenant focus group, Brisbane, 18/9/14)

Another tenant participant from the tight rental market on the NSW Central Coast considered that an EER would only be influential if there was more choice available for prospective tenants:

It would be helpful, maybe, if it was an area where there was more choice for rental and you got to pick which one you want. (Tenant focus group, NSW Central Coast, 10/9/14)

Other participants outlined that their perceived validity of the EER was affected by whether an independent certifying authority provided the EER, rather than the owner or a real estate agent with a vested interest in selling the property:

INTERVIEWER: *Would the information on an EER sway you at all?*

RESPONDENT: *Yeah, if it's done by an independent person ... If it's done by an agent, I don't think so.*

INTERVIEWER: *What if it's done by the owner?*

RESPONDENT: *Oh, God, no. (Owner occupier focus group, NSW Central Coast, 10/9/14)*

Some focus group participants advised that an EER would influence their purchasing or renting decision if the energy efficiency reductions could be expressed somehow in dollar values:

[Could it] actually should show you how much you can save per month or something? Maybe that will catch people more because ... obviously money is a very big factor in all of this. (Owner occupier focus group, Sydney, 9/9/14)

The reality is that money comes first at this stage. So I'd like to see some kind of monetary value, like three stars equals this much [money] (Tenant focus group, Brisbane, 18/9/14)

The final feature of the EER that was noted by focus group participants outside the ACT were the recommendations provided on the reverse side of the certificate that outlined how the rating could be improved. This 'renovators' guide' was seen as a positive influence for purchasing and renovating:

On the back, where it says if you changed these things about the house ... you might then go, "Okay, well let's see if it's going to improve it". ... that bit would be useful if you were going to go ahead and buy it. (Owner occupier focus group, Brisbane, 18/9/14)

Several investors considered that an EER could provide the basis for both a higher sale price and a higher rental price:

As a purchaser, you could use it as a tool to negotiate your price better anyway... [and] I think if you just show your tenant this piece of paper and said, "Look at all these stars. This is going to reduce all your energy and heating and cooling costs," I think you could quite easily charge them more for their rent. (Investor focus group, NSW Central Coast, 10/9/14)

There was debate among participants regarding who should pay for the EER, whether it should be mandatory, and whether it might lead to further costs for the seller. Some investors on the NSW Central Coast considered that the EER should be conducted and paid for by the seller as part of the contract, while others in the same focus group considered that the EER should be commissioned by an interested buyer in a similar way (and similar price) as a pest and building inspection. However, some owners were concerned that an EER could identify problems with the home just prior to selling, thus increasing costs or reducing potential buyers:

I think it's a good thing for the buyer but it's another cost for the seller... because you'd only find out at the last minute that you don't reach the energy standard and then you'd have to go and pay extra money to get it up to a certain standard. That's the problem, and you're selling it and not making any money from it. (Owner occupier focus group, Sydney, 9/9/14)

In Canberra, the investor and owner occupier focus group participants were very familiar with the EER. Overall, the Canberra participants were welcoming of the concept:

I think it's good that there are things like that that are mandatory. I think that we should have that information. (Owner occupier focus group, Canberra, 8/9/14)

Many tenants were not aware of the system, or were aware but did not pay attention to the rating:

RESPONDENT 1: *I wouldn't even know what the star rating is.*

RESPONDENT 2: *Yeah, I did. I've never really paid attention to it though.* (Tenant focus group, Canberra, 8/9/14)

Although those familiar with the EER welcomed the concept, they were highly critical of the method and validity of the current EER certification. They considered that the list of features to rate was limited, and thus important energy efficiency features were not incorporated:

They don't [have] every feature... and so we've got a five and a half star energy rating when it should be in reality 10. So the whole system's a bit dodgy. (Investor focus group, Canberra, 8/9/14)

Furthermore, there were concerns that the system was regularly changed and expanded, thus changing the ability to compare similar efficient homes:

I thought energy efficiency was one [out] of five stars, then I read ... [there's] now six star energy efficient, and I think, like "what's six energy efficient stars?". So it's really hard for the average person to know now is four star not actually as good as four stars used to be? (Owner occupier focus group, Canberra, 8/9/14)

The outcome of these concerns was that the Canberra participants did not consider the current EER to have much validity or meaning, and one participant recommended limiting the influence of the EER on the final purchasing decision:

So when we bought it we knew that it was 0.5 ... it was supposed to be rubbish but we make it work. ... I think they can be a bit deceiving and I think you don't necessarily want to pay too much attention. (Owner occupier focus group, Canberra, 8/9/14)

When asked whether the EER influenced their decision of whether to purchase or rent a home, many Canberra participants considered that this was a helpful input of information, but they would not pay extra for a higher energy rating, and the rating would not be the main influence:

I think at the end of the day there's a whole bunch of other things that the energy rating's not necessarily going to be the be all and end all in making that decision. (Investor focus group, Canberra, 8/9/14)

Influential information sources

- From a set list of options, the more trusted sources of information were architects, electricians, government agencies, friends, family or neighbours as well as building certifiers, builders and plumbers.
- From a set list of options, the less trusted sources of information were real estate agents, property developers, retail shop staff and property valuers.
- From a set list of options, participants' preferred channels of information delivery were an energy-rating tool, government websites and case studies.

This section provides the range of information sources used to assist decision-making on housing choice and energy efficiency. The survey asked participants whom they trusted to provide honest information about home energy efficiency and products from a list of options. Results are presented in Table 11 and show that the more trusted sources of information were architects, electricians, government agencies, friends, family or neighbours as well as building certifiers, builders and plumbers. The sources of information that were less trusted included real estate agents, property developers, retail shop staff and property valuers.

Table 11 Trust in information sources

	N	Mean	Standard deviation
Architects	106	3.70	0.91
Electricians	106	3.58	0.83
Government agencies	106	3.50	1.03
Friends, family or neighbours	106	3.43	0.95
Building certifiers	106	3.33	0.88
Builders	106	3.20	0.81
Plumbers	106	3.07	0.88
Interior designers	106	2.99	1.07
Property valuers	106	2.61	1.02
Retail shop staff	106	2.58	0.98
Property developers	106	2.47	0.93
Real estate agents	106	2.08	0.94

Likert scale from 1 'not at all' to 5 'very much so'

The survey also asked participants for their preferred channels of information delivery from a set list of options. Results presented in Table 12 show that the three most preferred options included an energy-rating tool, government websites and case studies. Advertising through TV and newspaper or magazines were the least preferred options.

Table 12 Preferred channels of information

	N	Mean	Standard deviation
Through an energy rating tool	106	4.17	0.810
Through government websites	106	3.91	1.065
Through case studies that show the advantages and disadvantages of energy efficient products	105	3.85	1.017
Through visiting a home exhibition show	106	3.71	1.086
Through industry websites	106	3.65	1.042
By having a home energy expert visiting my house	105	3.65	1.263
By visiting an energy efficient home in my city	105	3.50	1.057
Through TV advertising	106	3.08	1.196
Through newspaper or magazine advertising	106	2.83	1.091

Likert scale from 1 'not at all' to 5 'very much so'

During the focus group discussions, participants were asked an open ended question regarding the trusted and influential sources of information. A diverse range of information sources were offered, which were comprehensively captured as they provide new insights into perceptions of such sources. Summary tables are provided to detail the information sources, as well as the related format, timing, messengers and efficacy of this information delivery. As the responses differed for each participant type, the responses from owner occupiers, investors and tenants are presented in separate tables.

OWNERS

The owner occupiers from all four locations provided a large range of sources which they sought or from which they received influential information on which to make their purchasing decision and related decisions regarding energy. These information sources are summarised in Table 13, and are divided into internet, television, documents, funded programs, events, and people interaction. The participant's location is provided in brackets.

Table 13 Influential information sources on housing and energy for owner occupiers

What/ (location)	who	Helpful?	How (format)	When	Messenger
Internet					
Realestate.com search categories (Brisbane)		Yes	Select categories of interest	When 'in' the market to buy	Real estate agents inserting information through existing web categories
Google (Canberra, Sydney, NSW C Coast)		Yes	General searches, clicking onto the top sites listed and seeking consistent information	Anytime, often to seek further information, costs or a comparison	Usually click through the top items from a search
Information comparing the costs of the options (Canberra)		Yes- but considers it does not yet exist	Cost comparison between different energy efficiency interventions	During decision-making process	Ideally an independent source rather than vested commercial interest

What/ who (location)	Helpful?	How (format)	When	Messenger
Online forum (Sydney)	Yes	Specific questions of interest regarding energy	When buying or renovating	Contributors who have experienced the same issue
CHOICE.com.au (NSW N Coast)	Yes	Comparison of appliances and user reviews	During decision-making	Australian Consumers' Association
Solar PV supplier websites (Sydney)	Yes- but is read knowing there is a vested interested in selling products	Costs, benefits, source, safety issues	During consideration of installing solar PV	Solar retailers
Television				
Grand Designs (Brisbane)	Yes- but considered out of average price range	Reality TV show	Weekly	Presenter, Kevin McCloud
Documents				
House contract (Canberra)	Yes	Printed document	During and after purchase	Lawyer
Local government information (Canberra, Sydney)	Yes	Printed newsletter / pamphlet, fact sheets, guides	Pick up anytime, or search for topic of interest when renovating or buying	Local council officer
Energy retailer newsletter (Canberra, NSW N Coast)	Mixed- as retailer seen as vested interest	Printed newsletter	With delivery of quarterly energy bill	Energy retailer
'How to' guides (Canberra)	Yes	Printed document or on internet	Seek when intending to renovate/ decision-making	Mixed
Funded programs				
Home energy assessment (Canberra, NSW C Coast)	Yes- but prefer independent organisation rather than energy retailer in current program in Canberra	In-home energy assessment	Offered in Canberra by AGL energy retailer	Trained assessors
Climate Smart Qld (Brisbane)	Yes	In-home energy assessment and range of low cost energy efficiency technologies, plus in-home device	18 month Qld state government program (now closed)	Trained installers

What/ (location) who	Helpful?	How (format)	When	Messenger
Events				
Public forums (Canberra)	Yes	Forum for citizens with expert/ guest speakers	When available	Expert speakers
Sustainable House Open Day (Canberra)	Yes	Option to enter energy efficient homes and meet owners	Annual day	Home owners
Home Shows (Sydney)	Yes	Display of new EE products for residences	Annually	Retailers
People interaction				
Friends / neighbours / colleagues who have done renovations before (Brisbane, Canberra, Sydney, NSW C Coast)	Yes	Discussion	During decision-making process	Trusted people within social networks
Older people with past experience (eg grandparents) (Brisbane)	Yes	Discussion during visit to home	After purchasing	Grandparent etc
Tradespeople (Brisbane, Sydney)	Mixed- because they ask what the customer wants rather than recommending the 'best way'	Discussion	During quote-seeking process	Tradesperson with speciality
Door-knockers from salespeople (Brisbane, NSW C Coast)	Mixed- but mostly negative	Doorstep offer	Sales campaign	Salesperson
Real estate agents (Brisbane, Sydney, NSW C Coast)	Mixed- with potential for being useful	Discussion	When seeking to buy or rent	Agent

The above range of influential information sources is further illustrated by the verbatim quotes of the owner occupiers. Online forums were considered to provide valuable, independent opinions from individuals who had experienced the issue under discussion:

[Online forums] I find are really good because people just write in their reviews ... I think mainly from consumers themselves are the best way of judging your product as good or efficient because they can usually see [the impact] seeing their bills come through or whatever it is, or the efficiency of it or how well it works or whatever the product is. (Owner occupier focus group, Sydney, 9/9/14)

One quote that referred to the use of hard copy documents by an owner occupier was:

INTERVIEWER: *How did you know insulation was there?*

RESPONDENT: *It was in our contract. (Owner occupier focus group, Canberra, 8/9/14)*

When describing the previous or anticipated experience of an in-home energy assessment, one participant stated:

I would like some independent person or organisation to come to my house and do like a proper kind of audit of the house about what the actual [options are] ... and stand there and talk to ... like a really holistic kind of assessment. (Owner occupier focus group, Canberra, 8/9/14)

Quotes that described the influence of advice from neighbours and family on the decision of owner occupiers were:

So we got the advice from some neighbours in the area to live through [for two seasons] before you made changes. [They're very trustworthy] because they're not trying to sell you something, they're going on their life experience. That's what they're telling you. (Owner occupier focus group, Brisbane, 18/9/14)

Friends [and family] ... who have installed [things]. Dad was just talking on the weekend about energy efficiency and how much he's reduced his power bill by changing his halogens to LEDs. (Owner occupier focus group, Brisbane, 18/9/14)

The reliance on information from real estate agents was mixed, with a cynicism often expressed, but also recognising the potential for agents to be a crucial information source:

[The agent] had a spiel. He had a wonderful spiel about everything. Look, it didn't worry me. It's his job. I know what I want so it really didn't matter. (Owner occupier focus group, Sydney, 9/9/14)

It's the agents' speeches about the house that are going to help sell the house, like, "oh, it's got solar panels, it's going to save your bill"... they will highlight those features not because they've [got a] sustainable attitude. (Owner occupier focus group, Brisbane, 18/9/14)

If [an agent] is selling a home it would be foolish of them not to put in any discussion about [how] it's got low LED lighting or whether it's got water tanks or solar panels, et cetera. That should be really just part and parcel of their sales pitch. (Owner occupier focus group, Sydney, 9/9/14)

One participant did note that the real estate agent had highlighted energy efficient features, such as natural lighting and northern aspects, during the open house inspection, but had not used the terminology of 'energy efficiency':

He didn't highlight it as energy efficient. He highlighted it as good for us because it has [natural lighting], is north facing. (Owner occupier focus group, NSW Central Coast, 10/9/14).

INVESTORS

The investor focus group participants provided a very different range of information sources to the owner occupiers. Notably, the main sources of information mentioned was people interaction, but this included professional and commercial sources only, and did not include anyone within their social networks. The findings are summarised in Table 14, and the participant's location is provided in brackets.

Table 14 Influential information sources for investors on housing and energy

What/ (location)	who	Helpful?	How (format)	When	Messenger
Internet					
Guide to maximising use of solar panels (Brisbane)		Yes	Simple layout with dot points	When moving into new home with solar panels	Solar panel retailers
Real estate advertisements		Mixed- noted that solar panels and energy efficiency were not listed	Select categories of interest	When 'in' the market to buy	Real estate agents inserting information through existing web categories
Whirlpool online forum (NSW C Coast)		Yes	Specific questions of interest regarding energy	When buying or renovating	Contributors who have experienced the same issue

What/ (location) who	Helpful?	How (format)	When	Messenger
Television				
General media re energy initiatives (Brisbane)	Yes	Range of energy topics in news stories, documentaries and ads	During general viewing	Various programs and ads
News re interest rates and energy efficiency tips (Brisbane)	Yes	News stories and human interest tips for reducing energy costs	During general viewing	News reader
Grand Designs (NSW C Coast)	Yes	Reality TV show	Weekly	Presenter, Kevin McCloud
A Current Affair (Brisbane)	Yes	Weekly tips for reducing energy costs	During general viewing	Presenter
Documents				
Regulatory requirements (e.g. BASIX) (Brisbane)	Yes- but should be provided earlier in design process	Check list format	During certification of house design	Architect
Defence housing requirements (Brisbane)	Yes	Check list format	Prior to design	Defence Housing Australia
Energy bill (Brisbane, NSW C Coast)	Mixed- the comparative information is well-received, but energy retailers are not highly trusted	Costs and comparative information	Quarterly by post	Energy retailer
Funded programs				
General government programs (Brisbane, NSW C Coast)	Yes- as government as seen as more neutral than commercial interests	Range of formats- websites, pamphlets	During decision-making	Government – any level
Climate Smart Qld (Brisbane)	Yes	In-home energy assessment and range of low cost energy efficiency technologies, plus in-home device	18 month Qld state government program (now closed)	Trained installers
People interaction				
Seller (Brisbane)	Yes	Discussion on site how to maximise efficiency of solar hot water system	Following property purchase	Seller

What/ (location)	who	Helpful?	How (format)	When	Messenger
Tradespeople (Brisbane)		Yes	Discussion on site on maximising efficiency of hot water system	During hot water system malfunction	Plumber
Technology retailers (Brisbane)		Yes	Advice by telephone on benefits of rooftop solar installation	During decision-making process	Retailer
Real estate agent (Canberra, NSW C Coast)		Mixed- some provided information on star rating and energy efficiency; others do not raise the subject	Discussion during open house viewing	During property viewing	Real estate agent
Developer (Canberra)		Mixed- due to low trust of developer	Discussion on energy efficiency of the property	During property viewing	Sales representative

Several quotes illustrated the perspectives and experience of investors seeking and receiving information. Regarding the absence of energy efficiency information in real estate search options and advertisements, one investor stated:

Oh, I just can't believe [the seller] had 16 solar panels on her roof and didn't even have them on the [real estate] ad. (Investor focus group, Brisbane, 18/9/14)

Online forums with 'ordinary individuals' who had experienced the same issue were seen as unbiased and valuable:

I actually find the Whirlpool forum is really useful. It's no-one that you know, ... it does kind of give a general consensus of what people think about stuff. (Investor focus group, NSW Central Coast, 10/9/14)

Regulatory requirements for new buildings, using tools such as the NSW BASIX, was provided much later in the design process than one investor would have preferred, requiring changes to the design:

That was given to me [by the architect] after we had designed the house. So that was really quite shocking, to be quite frank ... I think when we went to certify it to make sure that it was okay, that's when they said, "You have to comply with this to get it signed off" ... I was absolutely floored. (Investor focus group, Brisbane, 18/9/14)

The advice of real estate agents on energy efficient features was mixed, with Canberra investor participants describing both too much and an absence of such information from their experience:

RESPONDENT 1: *So now ... if you start asking questions about the energy efficient [the agent will] rabbit on all day about what the house has or doesn't have.*

RESPONDENT 2: *We've been looking for property investment for the last couple of years and I can say hand on heart not ever has an agent actually highlighted the features of a home for energy sustainability in any way shape or form. (Investor focus group, Canberra, 8/9/14)*

A NSW Central Coast investor felt that the advice from a real estate agent depended on the individual:

The agent we are with now, we just trust his opinion more, and we feel he gives more of an honest answer if something needs replacing ... Where before, the agent we were with didn't do anything. (Investor focus group, NSW Central Coast, 10/9/14).

TENANTS

For participants in the tenant focus groups, the main form of information that influenced their rental decision was the advertisement provided on real estate websites. Furthermore, the participants became very enlivened when they described their vision for a smart phone app to identify the energy efficiency features that they should seek in a rental property that would potentially provided lower energy bills. It is worth noting, though, that this discussion occurred within the context of the identified 'tenants' market' of Brisbane, in contrast with the very tight Sydney and NSW Central Coast markets. The findings are described below in Table 15.

Table 15 Influential information sources for tenants on housing and energy

What/ (location)	who	Helpful?	How (format)	When	Messenger
Internet					
General (Brisbane, Sydney)		Yes- but concern about which sources to trust	Various websites that come up in a Google search	Various	Various government, commercial and other interests
Real estate websites, including realestate.com.au; allhomes.com.au (Brisbane, Canberra)		Yes- but awareness that the search options are limited and do not have specific energy efficiency categories	Select categories of interest	When 'in' the market to rent	Real estate agents inserting information through existing web categories
CHOICE.com.au (Brisbane)		Yes	Comparison of appliances and user reviews	During decision-making	Australian Consumers' Association
Government websites (Brisbane)		Yes- considered to be trustworthy, but seeking more summaries as current range of information too diverse and complex	Various sites from '.gov.au'	Various times	Government departments
Bulk purchases (Sydney)		Yes	Online sign up for group purchase	When group purchase offer is available	The Big Switch (and similar)
Commercial websites (Brisbane, NSW C Coast)		Mixed- as there is a vested interest in selling a product	Various regarding specific products	When considering purchase of appliances	Commercial retailer
Television					
Energy advertisements (Sydney)		Yes- especially if humorous	Initiatives for reducing energy consumption	During general viewing	Energy retailre
Documents					
Regulatory information (Canberra)		Yes- as the certification by an independent body was trusted	Certificate of Energy Efficiency Rating	When considering rental	Real estate agents inserting information through existing web categories
Council newsletter (Brisbane)		Yes	Newsletter with topics of relevance to local residents	Quarterly delivery to letter box	Local government

What/ (location) who	Helpful?	How (format)	When	Messenger
Residential Tenancies Authority Qld booklet/website (Brisbane)	Yes	Booklet and associated website with rights and relevant information for tenants	When considering rental market	Residential Tenancies Authority Qld
Energy efficiency checklist pamphlet (Brisbane)	Yes- proposed checklist for energy efficient features	Checklist of features to seek or identify when viewing a rental property	When viewing a potential rental property	Non-commercial source, such as Residential Tenancies Authority Qld
Energy bill and associated newsletter (Sydney)	Yes- but more specific information is sought using the phrases 'save'	Comparative visual information on energy usage for different periods and similar homes	Quarterly bill	Energy retailer
Phone applications				
Energy efficiency checklist app (Brisbane)	Yes- proposed checklist for energy efficient features	Checklist of features to seek or identify when viewing a rental property, with calculation built-in	When viewing a potential rental property	Non-commercial source, such as Residential Tenancies Authority Qld
Funded program				
Climate Smart Qld (Brisbane)	Yes	In-home energy assessment and range of low cost energy efficiency technologies, plus in-home device	18 month Qld state government program (now closed)	Trained installers
Home energy assessment (Canberra, NSW C Coast, Sydney)	Yes- but prefer independent organisation rather than energy retailer in current program in Canberra and free of charge	In-home energy assessment, ideally for free and with free items (e.g. light bulbs, shower head)	Offered in Canberra by AGL energy retailer	Trained assessors
Events				
Canberra Show (Canberra)	Mixed- as the stalls represented commercial interests	Stalls with energy efficiency information and products	Annually	Commercial retailers
Green Heart Fair (Brisbane)	Yes	Stalls with energy efficiency information and free products	Annually	Local government
People interaction				
Friends and family (NSW C Coast, Sydney)	Yes	Discussion about building materials for heating and cooling	In social conversation	Friends and family

What/ (location)	who	Helpful?	How (format)	When	Messenger
Real estate agent (Brisbane, Canberra, NSW C Coast)		No	Discussion about property features	When viewing a potential rental property	Real estate agent
Landlord (Canberra)		No- not forthcoming	Discussion about energy efficiency	When viewing a potential rental property	Owner
Previous tenants (NSW C Coast)		Yes	Discussion about comfort and energy costs	When viewing potential property	Previous tenants
Tradespeople (Canberra)		Yes	Discussion about property features	During consideration of potential rental property	Builders, plumbers, electricians

To illustrate the summary of information displayed in the table above, verbatim quotes are presented here. For government websites, some tenant focus group participants found the volume and diversity of information too confusing, and sought summaries:

I think there's too much [information] sometimes... sometimes you just want to know the small answer and it can go on and on It would probably be more successful doing the brief overview before you go into it further. (Tenant focus group, Brisbane, 18/9/14)

A range of tenants described the lack of information on real estate websites, as well as what they would ideally like to receive:

You get, sort of, random bits of information if you look on AllHomes.com.au, for example, you can find out what the [Energy Efficiency Rating] is and just tiny little bits. But you're not going to every bit of information that you might've wanted. (Tenant focus group, Canberra, 8/9/14)

I think it would be such a better idea to have rental list with a star rating on how energy efficient a property is. (Tenant focus group, Brisbane, 18/9/14)

In lieu of detailed energy efficiency information provided on real estate website search options, tenant focus group participants in Brisbane had a lively discussion on the need for an energy efficiency checklist for tenants to use when viewing a potential rental property. They detailed their ideal document:

I think even just like a brochure booklet on ... what to ask, and what are the things that make home energy efficient... if it's only 10–15 things to remember you'll probably commit it to memory . (Tenant focus group, Brisbane, 18/9/14)

These tenant focus group participants expanded their discussion to consider a smart phone application with such information, which could also provide a calculation to rate the property:

Like an app... so when you're going in there you go, "Oh, it's got that, tick it's got that – tick it's got that" ... the App could add up a score line automatically for you ... it raises your awareness of what makes it energy efficient ... you could maybe have a suggestion ... and then give the cost. ... I'd start looking at it, because I'd have something to go by ... to make that decision. (Tenant focus group, Brisbane, 18/9/14)

The in-home energy assessment was valued by the tenant participants who had received one, especially as it was a free service and also provided free energy efficient interventions, such as CFL light bulbs and water-efficient showerheads, at no cost. However, there was limited trust in the energy retailer providing this service:

I don't think I agree that AGL or someone like that, myself, because I pay my bills to them, I still pay them money for electricity. So I'm not sure I trust that. (Tenant focus group, Canberra, 8/9/14)

However, the value in this in-home visit was seen as the opportunity to speak directly with someone who had relevant information:

I think it's easier when someone explains it to you rather than having to read it... just having a conversation with someone and being able to ask questions. (Tenant focus group, NSW Central Coast, 10/9/14)

The tenant focus group participants did not consider that the real estate agents with whom they engaged during a rental property viewing had sufficient information on energy costs. Indeed, some even found they had less detail than the associated website advertisement:

The real estate websites ... gives you like the points ... but then you go that next step [to talk to a real estate agent] and there's nothing there ... to give you all the answers ... [the agents] couldn't really give me a ball figure on that, just brushed it by. (Tenant focus group, Brisbane, 18/9/14)

I tend not to listen to a thing that the real estate says because their entire purpose is to [get your business]. (Tenant focus group, NSW Central Coast, 10/9/14)

Building regulations and certification

- For some participants, energy efficiency required through building regulation caused significant frustration, with the regulations perceived as being mismatched with the climatic conditions and housing style.

The relevant building regulations and certification processes strongly influenced consideration of energy efficiency for new and renovated residential properties. All focus group participant types and locations had strong opinions about the opportunities and limitations for energy efficiency from building regulations. Several had lived in apartment buildings that they considered had not been required to consider basic energy efficiency features, such as aspect and natural light- and they had experienced discomfort as a result:

They're building the [apartments] cheaply. They're not thinking about the location, they're not thinking about where the sun is. It's just what ... can we get the most rent for the cheapest price? ... So summer hits, you're on the second floor, and it heats up. You've got carpet on the floor; you've got windows on the wrong side. (Tenant focus group, Canberra, 8/9/14)

Several owners and investors had built their own homes, and had encountered strict building requirements. One was surprised at how detailed the certification process was to secure a six star rating:

Yeah, well, mine was knock-down, rebuild, so ... I had to go through that process of the State Government's thousand points on the criteria regarding water tanks and dual flush and everything else. (Owner occupier focus group, Sydney, 9/9/14)

[Our developer did] the full rating thing and it is certified so there is a third party that goes and looks at it ... they've got to see everything else that you've got before they'll sign off on the piece of paper. (Owner occupier focus group, Brisbane, 18/9/14)

This certification process was particularly crucial for an investor who had built a home for rental by the Department of Defence, who had particularly stringent requirements:

Oh, solar lights and all these things, ... you had to have a certain size water tank in there, and it had to be plastic, not concrete, had to be recycled plastic, and all these things that it had to be, right down to the TV antenna, it had to be in a certain place so it couldn't be seen from the road, and all that sort of stuff. (Investor focus group, Brisbane, 18/9/14)

For some, this level of certification caused significant frustration, with the regulations perceived as being mismatched with the climatic conditions and housing style:

When I said I wanted to have louvers [they said] "Oh, no, you can't have louvres unless they are double-glazed". ... So this is the thing that we are bound by as renovators in Queensland. Someone in Canberra [is] making the stupid rules. (Investor focus group, Brisbane, 18/9/14)

Landlord-Tenant dynamics

- Investor participants' energy efficiency priorities for their investment properties differed significantly from the decisions and features they sought for their own home.
- Many tenant participants did not expect their landlord to provide energy efficiency improvements, or were afraid to ask in case the rent was increased.
- Many investors described the value they received from long-term, stable tenants if they were comfortable and satisfied.

A further issue that influenced whether investment properties received energy efficient upgrades was the perspective of the investor, and the perceived value that they saw in energy efficient features. Participants in the investor focus groups

clearly detailed that their priorities for investment properties differed significantly from the decisions and features they sought for their own home:

When you're buying for yourself, you're thinking about the features ... rather than just about the price and location, because you have to live in it ... Whereas for me, our investment properties- I have no emotional connection to them whatsoever. ... as long as I'm going to get the rent that I want to get for it, I don't really care what it looks like. (Investor focus group, Brisbane, 18/9/14)

In my own house I might put in all solar panels and instant hot water heating and LED lighting and all that sort of stuff, but my rental properties are all investment and return and they're maintaining as far as plumbing and all the standards that they need to. (Investor focus group, Sydney, 9/9/14)

One tenant in the focus group was benefitting from the installation of solar panels on her roof. However, this was perceived to have been installed for the owner who was temporarily renting it out:

The landlord was living there until we moved in basically. ... I don't know how long the panels were there before they decided to leave. It would've been for them, but we're just benefitting from it. (Tenant focus group, Canberra, 8/9/14)

Another investor considered that his tenants were not seeking energy efficient benefits, and these were also not a priority for him:

I found tenants couldn't care less, and I couldn't care less either as long as I've got tenants, they pay on time, those sorts of things (Investor focus group, Canberra, 8/9/14)

This perspective of tenants having no energy efficiency expectations was supported by a comment from a tenant, who also communicated a lack of empowerment to make energy efficient changes:

We're renting, so I don't want to fork out a whole heap of money; that's what the landlord does ... there's also the fact that you've got to get permission to do anything. (Tenant focus group, NSW Central Coast, 10/9/14)

The perceived barrier of a landlord preventing energy efficient changes was a theme often provided by tenants in all of the focus group locations, to the extent where at least one tenant had paid for the changes herself:

My house is government rented, and I find it quite hard to get them to do anything. ... We had to put up awnings to help with the heat. So you're doing these things at your expense, [but] it's not your property. (Tenant focus group, Canberra, 8/9/14)

When we got the letter [from the energy retailer] saying we're in your area, ... we'd be happy to come out and make your home more energy efficient, my husband said there's no point, because we can't do anything, because it's not our house. So tenants have that mentality. (Tenant focus group, Canberra, 8/9/14)

Other tenants were able to achieve small energy efficiency changes because "we complained enough" (Tenant focus group, Canberra, 8/9/14), or because they considered they had been stable tenants for long enough to ask for a 'reasonable request'. However, other tenants withheld from making any energy efficiency requests as they were worried that their rent may be increased or the property even sold as a result:

I'm not putting a cent into another rental home. I'll leave it. ... then just say, "I'm not changing anything. You don't change anything, leave the price as it is." (Tenant focus group, Sydney, 9/9/14)

Despite the prevalence of this disempowered perspective from tenants, and the resulting loss of potential energy efficiency opportunities to their homes, many investors described the value they received from long-term, stable tenants. They considered that if the tenants were comfortable and satisfied, they would look after the property as their own home. These investors described the importance of receiving tenant feedback on the comfort and maintenance requirements of their property, and of the premium that a comfortable property can have on the rental market:

We've all had a bad tenant. And so sure, you fix the tap and the pipes, whatever it is.... it's also the fact that if it's not addressed it's going to cost you much more ... (Investor focus group, NSW Central Coast, 10/9/14)

It's not always about the money, it's about keeping the good tenants. (Investor focus group, Sydney, 9/9/14)

[If it's] more comfortable for the tenant ... you can use that as an advantage to get a tenant in. (Investor focus group, Canberra, 8/9/14)

Perceived Benefits and Barriers to Energy Efficiency

This section presents the perceived barriers and benefits to installing energy efficient initiatives in homes, from the perspective of the focus group participants. Initially, findings regarding the barriers of choice and information and other broad barriers and drivers are presented. The latter sub-section explores specific energy efficient features and how these are perceived.

Broad perceptions of energy efficiency

- A large number of participants agreed with a statement that improving the energy efficiency of the home is too expensive.
- The main motivation for owner occupier participants to install energy efficient features in their homes was to reduce energy costs.
- Investor participants indicated they would be hesitant to invest in energy efficient features for an investment property, due to a perceived insufficient financial return.
- Tenant participants were motivated to adopt energy efficiency initiatives to reduce energy costs and benefit the environment.

In the survey, a large percentage of participants (52% of owner occupiers, 38% of investors and 31% of tenants) recognise that there are enough choices of energy efficient products available. However, about a quarter of investors and a third of tenants believe that there are not enough choices of energy efficient products available. Similar results were seen regarding to information available about how to improve a home's energy efficiency. Overall, 49% of participants disagreed that there is not enough information available. However, amongst tenants, only 24% disagreed that there is not enough information about how to improve a home's energy efficiency available. This result suggests that somehow owners (owner occupiers and investors) are being exposed to greater energy efficiency information when compared to tenants. These results are shown in Appendix A.5.

The survey also included a set range of energy efficiency statements for participants to state their level of agreement. The responses to these statements identified that perceived costs are a barrier for investing in energy efficiency. As shown in Appendix 0, a large number of focus group participants agreed that improving the energy efficiency of the home is too expensive. However, participants still reported a proactive approach to energy efficiency initiatives, with half of those who own a home (50% of owner occupiers and 54% of investors) stating that they have improved the energy efficiency of their home in the last two years. However, this percentage falls to 36% within the group of tenants, which is likely to reflect the additional barriers faced by tenants to improving their home energy efficiency, including split incentives. The mean responses are also provided in Appendix 0.

In the discussions, focus group participants outlined their drivers and barriers for considering energy efficiency without specific prompts. Table 16 summarises the different reasons offered by participants as to why they would or would not install energy efficient features in their home or investment property. As the perspectives differ widely by participant type, these motivations are detailed in separate sections below from each participant type, and also report their willingness to pay for energy efficiency.

Table 16 Motivations and barriers to installing energy efficient features

Participant type	Drivers	Barriers
Owner occupier	Environmental benefits	Time and effort to research options
	Reduced electricity costs	Uncertain of long term plans for sufficient payback
Investor	Government rebates and tax incentives	Tenants receive the financial benefits (split incentive)
	Selling point in the future	Slow return on investment
	Attraction and retention of tenants	
	Environmental benefits	
Tenant	Reduced electricity costs	Landlord may increase rent

OWNER OCCUPIERS

The prime motivation for owner occupiers to install energy efficient features in their homes was to reduce energy costs. These participants referred to the rising costs of electricity and being confronted with high electricity bills.

I was shocked when we got our first bill. (Owner occupier focus group, NSW Central Coast, 10/9/14)

I think cost is definitely the number one for everybody. (Owner occupier focus group, NSW Central Coast, 10/9/14)

Although cost reductions were a clear motivator, one participant also stated that it was important to be certain about long term ownership plans for a property before investing in substantial improvements to energy efficiency:

We don't know what our long term plan is ... are we going to renovate it? Are we going to knock it down? [So] we haven't invested any money in things like solar ... or even fixing up the insulation. (Owner occupier focus group, Canberra, 8/9/14)

INVESTORS

Investors indicated they would be hesitant to invest in energy efficient features for an investment property, with reasons typically reflecting the sentiment that there would be an insufficient financial return or split incentives, where tenants benefit from the investment made by the property owner:

I'm just sort of thinking in a purely business sense that I wouldn't get it back from a rental property. (Investor focus group Brisbane, 18/9/14)

Sustainable or energy efficient things ... don't put money back from investment perspective. (Investor focus group, Canberra, 8/9/14)

Another investor participant added that installation of technology, such as solar panels, could lead to greater maintenance costs:

So if you put solar panels on an investment property it's a massive outlay for something you don't get back, but it's also something else to fix when it breaks. (Investor focus group Brisbane, 18/9/14)

In contrast, some participants explained that they would be encouraged to install energy efficient features if there was an incentive provided by the government in the form of rebates or tax breaks:

The pull approach is that the governments be serious about ... energy efficient houses with rebates. (Investor focus group, Canberra, 8/9/14)

If you're an investor, you [should] get a tax break on starting to invest in energy-efficiency... (Investor focus group, Sydney, 9/9/14)

Further to tax incentives, another investor reflected that an investment in efficiency measures would benefit both the tenant and the environment:

If you went and put solar panels on the roof of your investment property, as an investor you will get a tax break. It's going to reduce the costs to the tenant anyway, and you're going to be saving the environment... (Investor focus group, NSW Central Coast, 10/9/14)

The benefits for tenants that were also the investor's motivation to install energy efficient features included being attractive feature to potential tenants that could attract higher rental:

[It would be] more comfortable for the tenant and therefore you can use that as an advantage to get a tenant in. (Investor focus group, Canberra, 8/9/14)

I think that you could charge a more premium rent if you had that [energy efficiency] factor. (Investor focus group, NSW Central Coast, 10/9/14)

You could work out how much cheaper it was or something and then charge them more rent or something like that. (Investor focus group, NSW Central Coast, 10/9/14)

TENANTS

Tenants stated they were limited in their role to the actions they could take to improve energy efficiency. Improvements that could be made to energy efficiency were generally motivated by a reduction in energy costs and benefits to the environment. Participants' quotes summarising these sentiments included:

I guess for me as a tenant, that's what I can contribute. So ... that's what I look at, in terms of what the price is like to ... bring my carbon footprint down. (Tenant focus group, Canberra, 8/9/14)

I think, at the end of the day, you'd want to save money. So it's good to be energy efficient. (Tenant focus group, Brisbane, 18/9/14)

Responses to specific energy efficiency features

- Energy efficiency with perceived benefits included natural lighting, rooftop solar PV, insulation, and floor coverings.

During the focus group discussions, participants were asked to share their views on specific energy efficient features. None of the features were prompted. As Table 17 displays, some of these perspectives were seen as barriers, while the majority were seen as benefits. The location of the participant is listed in brackets.

Table 17 Perspectives on specific energy efficient features

EE feature	Perceived benefit	Perceived barriers
Aspect	North facing for warmth and light (Tenant, Sydney)	
Natural lighting	Creates a pleasant atmosphere and reduces lighting costs; can heat during winter; cleaner internal environment (without the growth of mould) (Owner, Canberra; Owner, NSW C Coast; Owner, Brisbane; Investor, NSW C Coast; Tenant, Canberra; Tenant, NSW N Coast)	
Natural air flow	Feeling of freshness; free alternative to air-conditioning; an ability to dry clothes naturally (Owner, Canberra; Owner, Brisbane)	
Rooftop solar	Rebates and subsidies minimises costs for electricity (Owner, Canberra; Investor, NSW C Coast; Investor, Brisbane)	High upfront cost is not paid off fast enough if houses are sold within 5 years (Owner, Sydney)
Insulation in walls and ceiling	Maintaining warmth or cool in home (Owner, Brisbane; Investor, NSW C Coast; Tenant, NSW C Coast; Tenant, Canberra)	
Patio	Cooling home in summer (Owner, Canberra)	
External awnings	Cooling home in summer (Investor, Brisbane)	
Solar hot water with electric booster		Electric booster is on peak tariff and expensive (Tenant, NSW C Coast)
Rainwater tank	Plumbed into kitchen and laundry for easy use (Tenant, Brisbane)	
Double glazed or insulated windows	Maintaining warmth or cool in home (Owner, Canberra; Investor, Canberra)	
Door and window seal	Maintaining warmth or cool in home (Investor, Canberra)	
Floor coverings	To increase warmth during winter (Tenant, Canberra; Tenant, Sydney)	
Ceiling fans	Cheap and pleasant cooling (Investor, Brisbane)	
Efficient air-conditioners	Reduces heating/cooling costs (Tenant, Brisbane)	

EE feature	Perceived benefit	Perceived barriers
Water saving showerheads		Water delivered too slowly (Tenant, Brisbane)
CFL light bulbs		Slow to brighten the room (Owner, NSW C Coast)
Local bicycle paths	Cheaper and convenient than private car use (Investor, Brisbane)	

Some of these features are described in participant quotes. Having natural light and air flow was an equally high priority mentioned by focus groups participants, especially those in Brisbane and the NSW Central Coast:

I have lived in Queenslander [style homes] before and just with the design of how the air can actually flow straight through the house I find makes a big difference than having to open up all the windows or more modern designs where they're more boxed in. (Owner occupier focus group, Brisbane, 18/9/14)

Other energy efficient features mentioned by focus group participants included modern and efficient air-conair-conditioners, and rooftop solar, both of which had made it possible to maintain lower energy bills:

Our old place had old [air-conditioning] units, and our power bill was over 500 bucks. [In our new place] I made sure that they were newer models, a bit more energy efficient. (Tenant focus group, Brisbane, 18/9/14)

We [previously lived in a place with] five bedrooms, big pool, ducted air-conditioning, and so we were paying ... around \$1200 a quarter. And we've just moved into our ... new house. It has 16 [solar] panels on it ... And my first bill was \$126! (Investor focus group, Brisbane, 18/9/14).

Willingness to pay for energy efficient features

- From a set list of options, most participants (53%) indicated that the house orientation (i.e. North/East aspect) and/or installation of a reverse-cycle air-conditioner (51%) influenced their purchase decision.

In contrast to the earlier report section that outline all features that influence a purchase or rental decision, the survey also provided a set list of energy efficient features and asked respondents to indicate whether or not those features had affected or would affect their decision to buy or rent a home. Table 18 shows the number of participants who selected each of the features. Most participants (53%) indicated that the house orientation (i.e. North/East aspect) and/or installation of a reverse-cycle air-conditioner (51%) affected their decision-making. Other energy efficient aspects chosen by at least one quarter of participants included ceiling and/or wall insulation (38%), internal blinds or shutters (36%), ducted air-conditioner (34%), solar panels (33%), double-glazed windows (30%) and central heating (25%).

Table 18 Features that affected/affects participants' decision to buy or rent a home

	Frequency	Percentage of sample (%)
House orientation (e.g. North/East aspect)	57	53.3
Reverse-cycle air-conditioner	55	51.4
Ceiling insulation	41	38.3
Wall insulation	41	38.3
Internal blinds or shutters	38	35.5
Ducted air-conditioner	36	33.6
Rooftop solar panels	35	32.7
Double glaze windows	32	29.9
Central heating	27	25.2
Floor insulation	26	24.5
Ceiling fan	25	23.4
Fireplace	22	20.6
Draught proof windows	21	19.6
Curtains	20	18.7
Draught proof doors	19	17.8
External blinds, shutters or awnings	17	15.9
Tinted windows	11	10.3
None of the above	12	11.2
Others specified	12	11.2
➤ Location	2	1.9
➤ Backyard	1	0.9
➤ Bathroom and kitchen condition	1	0.9
➤ Carpet	1	0.9
➤ Cost	1	0.9
➤ Garage	1	0.9
➤ Kitchen appliances	1	0.9
➤ Lots of windows	1	0.9
➤ Natural light	1	0.9
➤ Price	1	0.9
➤ Security	1	0.9

More specifically, the survey asked participants if they were willing to accept a higher purchase price or higher rent if a home had rooftop solar PV system installed. Overall, two-thirds of participants responded positively, with investors (73%) and owner occupiers (69%) more willing to pay for homes with solar PV system installed when compared to tenants (58%). This is displayed in Table 19.

Table 19 Willingness to pay for homes with solar PV system installed*

	Renters		Investors		Owner occupiers		Total	
	Frequency	Percentage (%)	Frequency	Percentage (%)	Frequency	Percentage (%)	Frequency	Percentage (%)
No	14	42.4	10	27.0	10	31.3	34	33.3
Yes	19	57.6	27	73.0	22	68.7	68	66.7
Total	33	100.0	37	100.0	32	100.0	102	100.0

* Question: Would you accept a higher purchase price or higher rent if a home had a solar PV system installed?

To provide more detail on the willingness to pay more for a home with rooftop solar PV, participants were asked to detail their reasons from a set list. Participants responded to both the set options as well as adding additional reasons. As shown in Table 20, perceived monetary cost and benefits is the main reason why householders would accept higher prices, with 45% of participants willing to accept higher prices basis on potential costs savings. In contrast, not perceiving that benefits outweigh the costs was the most cited reason for not accepting a higher price, cited by 7% of focus group participants. Saving energy (5%) and environmental benefits (3%) were also reasons for accepting a higher price, while solar PV systems not being a priority (7%), affordability (4%) and lack of perceived benefits (4%) were reasons for not accepting a higher price.

From the tenant focus group participants' perspective there were a range of responses as to whether they would be willing to pay higher rent for a property with energy efficient features. Some participants indicated a willingness to pay extra. However, this willingness was often conditional on savings being gained through lower running costs, and that the extra amount was relatively low and still affordable based on their available budget.

If it says it has solar hot water and it was \$5-10 a week more, we'd split for it, because you know you're energy bill is going to be a lot less in the long run. (Tenants focus group, Brisbane, 18/9/14)

But, yeah, \$10, that wouldn't be a bother. If it was another \$70 I would be like, no (Tenant focus group, Sydney, 9/9/14)

Other tenants expressed concern that the extra rent paid might be greater than any reduction in running costs:

There wouldn't be enough of a saving energy-wise to justify paying more out every single week for the entire length of the year. (Tenant focus group, Sydney, 9/9/14)

I always think about my rent first and then I worry about the bills later. (Tenants focus group, Brisbane, 18/9/14)

Table 20 Reasons for accepting/not accepting higher rent/purchase price for rooftop solar

	WOULD ACCEPT		WOULD NOT ACCEPT	
	Frequency	Percentage (%)	Frequency	Percentage (%)
To save money	37	35	1	1
Depends on cost savings	11	10	2	2
To save energy	5	5	1	1
Influences purchase only (not rental)	4	4	0	0
Environmental benefit	3	3	0	0
Improves property value	3	3	0	0
Not a priority	1	1	7	7
Depends on upfront cost	1	1	0	0
If benefits are demonstrated	1	1	0	0
It is the right thing to do	1	1	0	0
Not available in public housing	1	1	0	0
Solar credit	1	1	0	0
No cost benefit	0	0	8	7
Cannot afford	0	0	4	4
No perceived benefit	0	0	4	4
Lack of knowledge	0	0	2	2
Unsure cost benefit	0	0	2	2
Total	69	64	31	29

A further specific question was asked in the survey regarding whether a higher price would be paid for an energy efficient hot water system. As shown in Table 21, most focus group participants (64%) indicated that the type of hot water system did not affect their decision to purchase or rent a home. For the remaining 36% for whom the type of hot water system is important when purchasing or renting a home, 56% of them sought a gas hot water system, followed by solar (28%), gas or solar (8%), electric (5%) or heat pump (3%).

Table 21 Influence of type of HWS on home purchase/rental

Does the type of hot water system affect your decision to purchase or rent a home?	Frequency	Percentage (%)
No	68	63.6
Yes. Which type of HWS do you seek?	39	36.5
➤ Gas	22	56.4
➤ Solar	11	28.2
➤ Gas or Solar	3	7.7
➤ Electric	2	5.1
➤ Heat pump	1	2.6

Discussion

The survey and focus group discussions resulted in a range of findings that provide opportunities for enhancing the context through which energy efficient housing is promoted and supported. The findings also identified pathways and approaches to communication that could enhance the understanding, uptake and corresponding action on energy efficient housing choices. In reflection of these two areas for improved energy efficiency uptake, opportunities on context and communication are highlighted below that could contribute to the next stages of research in the EnergyFit Homes Initiative.

Opportunities for the context of energy efficient housing

Aspects of the context in which energy efficient housing is delivered that were identified in the findings were the property market conditions, the tools and information systems applied to evaluate energy efficiency, and the policy mechanisms to promote energy efficient buildings and renovations.

Delivering into ready market conditions

The findings identified that the property market conditions differed markedly for each location, especially for those seeking rental properties – from a landlords' market in the southern cities and region, and to a tenants' market in Brisbane. This affected the range of choice that tenants had in terms of property features. The market conditions influenced the energy efficiency ambitions of tenants, who were less empowered to seek energy efficient rental properties in the markets with limited choice. In contrast, Brisbane is a tenants' market, and tenant participants sought appropriate information on energy to secure the most efficient property. However, these tenants also sought a short payback timeframe if the rental was higher in energy efficient properties.

Building the appropriate information systems

Some existing tools and information systems are well-understood and considered during decision-making on energy consumption. This is particularly the case for appliance energy ratings, using the yellow and red energy star stickers. Other exciting and hypothetical information systems were discussed. The features that could increase reliance on information systems include:

- Identify energy savings in monetary values;
- Employ colourful infographics and clear communication (noting that red and blue can be ambiguous in meaning when depicting heat retention);
- Provide comparative information with other time periods and other houses;
- Use the familiar energy star rating visuals;
- Include tips/ advice on energy improvement;
- Ensure the rating is completed by an independent assessor;
- Clarity regarding method of calculation, including transparency regarding assumptions and consideration of individual behaviour in energy calculations;
- Ensure a sufficient list of options to rate so that all aspects of new designs can be considered;
- Correlate the rating with the level of thermal comfort and cost of energy consumption.

Designing policy

Two aspects of policy were identified in the findings. Firstly, for some participants, energy efficiency certification caused significant frustration, with the regulations perceived as being mismatched with the climatic conditions and housing style. For others, the list of features that could be evaluated was too limited, which meant additional energy efficiency features were disregarded in overall ratings. Building regulation and certification policies could be revised to ensure relevance for all climatic zones and allow flexibility for additional and rarer energy efficiency features.

Secondly, a situation of split incentives currently exists, with the findings reflecting that investors were not installing energy efficient features into rental properties if there was no clear financial return on their investment. In response, tenants held low expectations for energy efficiency in their homes, and expressed a disempowered position when seeking such features from their landlords. This finding was in contrast with the acknowledgement by investors of the value they received from long-term, stable tenants if they were comfortable and satisfied. To reduce the split incentives, national policy that provided rebates or tax breaks for installing energy efficient features could be considered by policymakers.

Opportunities for the communication of energy efficient housing

Content, messaging and delivery were three aspects of communication that emerged from the findings as crucial to the uptake of energy efficient initiatives in renting, buying and renovating. Each of these aspects is considered in the sub-sections below.

Building on familiar and positive energy efficiency features

Of the many features that are sought by buyers and renters when seeking a home, some could be considered as energy efficient albeit not always communicated in this frame. Such priority features included natural light, house orientation (i.e. North/East aspect), blinds or shutters, solar panels, double-glazed windows and efficient hot water systems. Specific priorities for the participant types were ceiling insulation (for owner occupiers), solar hot water (for investors), and reverse cycle air-conditioners (for tenants). More specifically, the majority of owner occupiers and investors were willing to pay more for homes with rooftop solar PV installed. These priority features could be enhanced in communication of the property, without requiring specific identification or framing of these features as energy efficient.

When promoting specific features that were recognised as energy efficiency, the findings suggest that the following aspects should be emphasised to increase the perceived benefits:

- Natural lighting: Reduced lighting costs; healthier indoor environment; pleasant atmosphere.
- Natural air flow: Reduced cooling costs; pleasant atmosphere; ability to dry clothes naturally;
- Rooftop solar PV: Reduce energy costs- although need to communicate the payback period.
- Insulation: Increased home comfort; reduced energy costs.
- Solar hot water: Need to explain the options, use and associated costs for boosters.
- Double-glazed and insulated windows: Reduced energy costs; increased home comfort.
- Energy efficient lighting (CFLs; LEDs): Need to explain the wattage options and use to ensure appropriate brightness.
- Water-saving showerheads: Need to explain the options and use to ensure product satisfaction.

Crafting the right messages

The language used to communicate the benefits of energy efficiency options can significantly affect whether action is taken. The findings identified the importance of underlying attitudes, using familiar terms, creating positive concepts such as comfort, using monetary references, and supporting personal experiences. Well-crafted messages that address these aspects could contribute to increased uptake and support for energy efficiency. More detailed guidance for such messages included:

- **Frame message around concerns** for action on climate change and the depletion of energy resources.
- **Use relevant terminology** that is well-understood. A 'sustainable home' was seen as a holistic term incorporating a wider area than the house, whereas 'eco' or 'environmentally-friendly' was considered too vague. An 'energy efficient' home was a term that provided the most clarity to participants, and offered them a more defined scope that referred to installed features that ensured a more efficient and less costly consumption of energy.
- **Speak about home comfort, as the findings identified that** the majority of participants considered home comfort to be about temperature, where extreme heat and cold were minimised. Beyond thermal comfort, participants also identified visual, acoustic, and air quality comfort. Furthermore, personal experiences of thermal discomfort caused participants to prioritise thermal comfort in their choice of all future homes.
- **Use dollars to communicate energy savings**, rather than kilowatt hours, as the monetary savings were identified as a key motivator.
- **Deliver messages for the target audience.** The findings identified that owner occupiers considered energy efficiency with regards to environmental aspects, reduced electricity costs, the ready availability of information, and with clarity of payback periods for investments. Investors responded to energy efficiency in terms of government rebates and tax incentives, increasing the sale price of their property, the ability to retain tenants through increased comfort and lower energy bills, and if the return on investment can be realised. Tenants responded in terms of reduce electricity costs but only if energy efficiency interventions did not raise their rental price or jeopardise their lease. The findings identified that tenants are an audience requiring specific communication as currently owners (owner occupiers and investors) are being exposed to greater energy efficiency information than tenants.
- **Use case studies to communicate how different households can gain benefits** and achieve payback on their investments in energy efficiency, as a large number of focus group participants agreed that improving the energy efficiency of the home is too expensive and case studies were identified as one the top three preferred options for communication delivery.

Enhancing communication delivery

The delivery of energy efficient information was identified as important, in terms of both the messengers and the channels and format. The more trusted sources of information were architects, electricians, government agencies,

friends, family or neighbours as well as building certifiers, builders and plumbers. The sources of information that were less trusted included real estate agents, property developers, retail shop staff and property valuers.

A diverse range of effective and reliable channels of information delivery were identified in the findings, as well as the format in which this information was provided. Enhancements to specific channels identified in the findings could include:

- **Real estate search engines:** increase categories to include energy efficient features.
- **Comparative reviews** (e.g. choice.com.au): ensure independence in the assessment.
- **Government websites:** continue to provide current information on energy efficiency in summary format and from range of reliable sources.
- **Online discussion forums** (e.g. Whirlpool): provide Australia-specific forum with locally-relevant information.
- **Renovation television shows** (e.g. Grand Designs): increase focus on affordable homes.
- **News and current affairs television** (e.g. A Current Affair): continue to feature news and human interest stories on energy consumption reduction.
- **Television energy advertisements:** deliver in humorous format to increase interest and memory of messages.
- **Regulatory requirements for renovations and new builds** (e.g. Basix): ensure delivery of requirements early in planning process for maximum uptake.
- **Local government** (paper newsletter, online, fact sheets): ensure locally-appropriate information.
- **Tenant advocates** (e.g. Residential Tenancies Authority Qld): increase availability of relevant energy efficiency options for rental properties.
- **Energy retailer newsletter:** continue providing comparative information (different periods; average homes), and increase tips and advice to reduce energy spending.
- **In-home energy assessments:** ensure independent assessor (e.g. Government program).
- **Open house and home shows:** increase opportunities to view energy efficiency features in operation.
- **Phone app:** Develop app with list of energy efficient features to seek in a property, with internal calculator of rating to be completed by tenant during open house inspection.
- **Bulk purchases** (e.g. The Big Switch): offer energy information with purchase offer.
- **Tradespeople:** provide clearer guidance drawn from their experience.
- **Developers:** provide energy information information during viewing of plans or display home.
- **Real estate agents:** offer more energy-relevant information about property during open house.
- **Landlord/ previous tenants/previous owners:** readily provide information about comfort and running costs of the home during open house inspection.

Conclusions

This report presents the findings from 12 focus groups conducted to explore the understanding of features that contribute to energy efficient homes, and also the understanding of energy efficient rating tools and information systems. The perspectives from owner occupiers, investors and tenants were gathered from focus groups held in Canberra, Sydney, Brisbane, and the NSW Central Coast. Findings reflected that the location of participants affected their reliance and awareness of heating or cooling systems, depending on the climatic zone in which they were located. There were no obvious differences identified between metropolitan and regional participants within this sample of 107 participants. The participant types of owner occupier, investor and tenants did, however, elicit differences in findings.

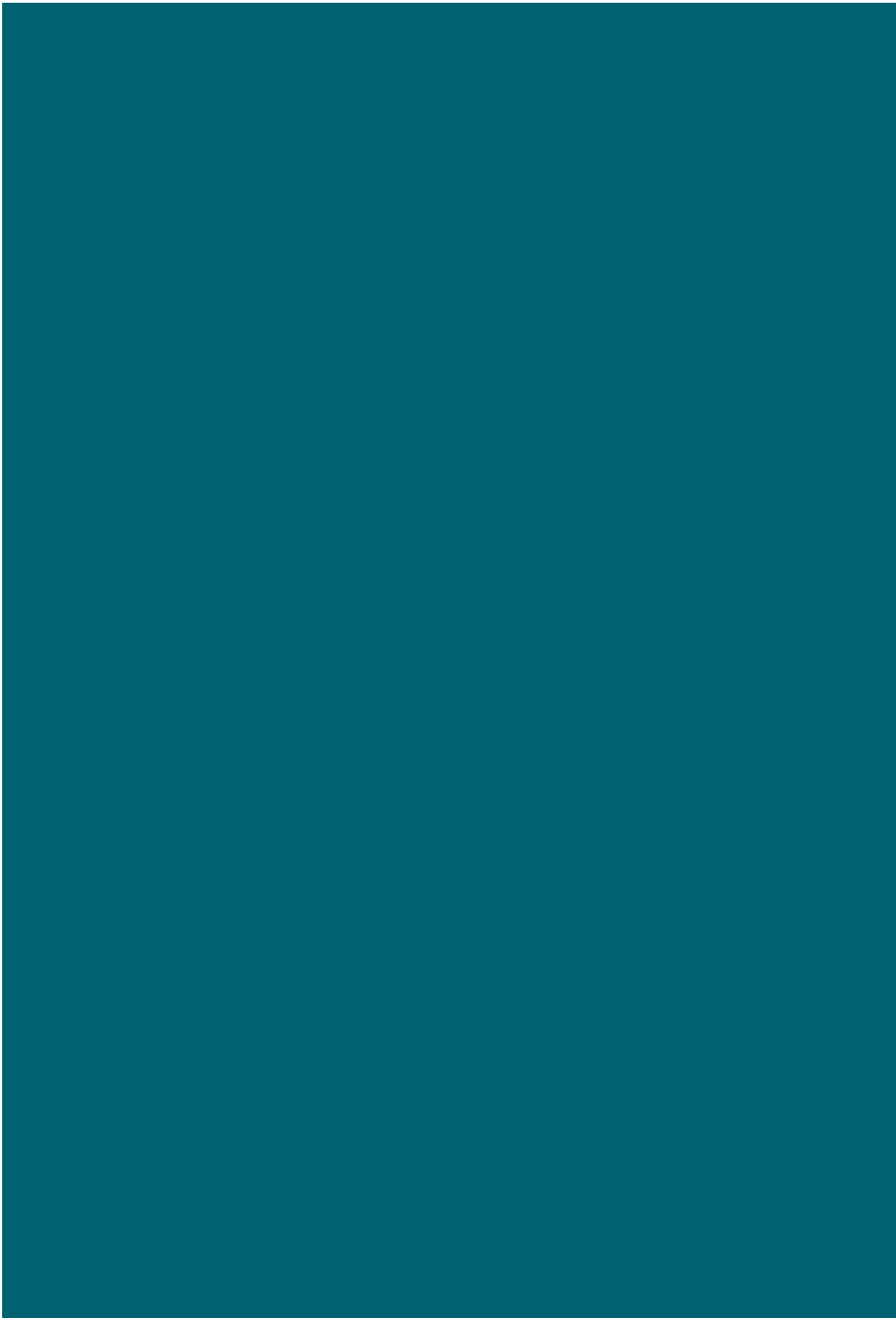
In summary, aspects of the context in which energy efficient housing is delivered that were identified as being important to increasing uptake were the property market conditions, the tools and information systems applied to evaluate energy efficiency, and the policy mechanisms to promote energy efficient buildings and renovations. In addition, content, messaging and delivery were three aspects of communication that emerged from the findings as crucial to the uptake of energy efficient initiatives in renting, buying and renovating. This included building on familiar and positive energy efficiency features, crafting the right messages, and enhancing communication delivery.

The next stage in this research is to conduct telephone-based interviews or online surveys with builders, developers and real estate agents to further investigate the gaps in information and skills to support increased sales and rentals of energy efficient homes.

In parallel with the specialist stakeholder interviews, a national survey representative of the Australian population will be conducted to investigate two key aspects:

- Individuals' perceptions to specific energy efficient features (e.g. installed PV, north-facing aspect, comfort, light exposure) to determine the influence, understanding and priority these have for homebuyers and tenants; and
- Stakeholders' (homebuyers; investors and tenants) perceptions of the useability and potential influence of home carbon rating regulation (voluntary or mandatory).

As with this analysis, the national survey findings will be compared between Australia Capital Territory (ACT) respondents, where mandatory rating disclosure is required, and other states. These findings will be delivered in February 2015.



Appendix 1: Focus group survey

1. Please write down what comes to your mind when you think of a comfortable home.
2. Please write down what comes to your mind when you think of a home that is energy efficient.
3. This question is designed to help us understand what is most important to you when you buy or rent a home. The section shows several sets of four features. Please tick which feature (among each set of four) is the MOST important and which is the LEAST important to you. We need to ask you to answer several sets to gather your opinion on all the features.

Set	Which is MOST important? (tick one from each group of 4)	What features are MOST and LEAST important to you if you were to buy or rent a home?	Which is LEAST Important? (tick one from each group of 4)
A	<input type="checkbox"/>	Air-conditioner(s)	<input type="checkbox"/>
	<input type="checkbox"/>	New bathroom(s)	<input type="checkbox"/>
	<input type="checkbox"/>	Ceiling fan(s)	<input type="checkbox"/>
	<input type="checkbox"/>	Solar panels	<input type="checkbox"/>
B	<input type="checkbox"/>	Wall or floor insulation	<input type="checkbox"/>
	<input type="checkbox"/>	Air-conditioner(s)	<input type="checkbox"/>
	<input type="checkbox"/>	New bathroom(s)	<input type="checkbox"/>
	<input type="checkbox"/>	Good natural lighting	<input type="checkbox"/>
C	<input type="checkbox"/>	Solar panels	<input type="checkbox"/>
	<input type="checkbox"/>	Wall or floor insulation	<input type="checkbox"/>
	<input type="checkbox"/>	New kitchen	<input type="checkbox"/>
	<input type="checkbox"/>	Ceiling insulation	<input type="checkbox"/>
D	<input type="checkbox"/>	Good natural lighting	<input type="checkbox"/>
	<input type="checkbox"/>	Solar panels	<input type="checkbox"/>
	<input type="checkbox"/>	Wall or floor insulation	<input type="checkbox"/>
	<input type="checkbox"/>	New kitchen	<input type="checkbox"/>
E	<input type="checkbox"/>	Solar hot water	<input type="checkbox"/>
	<input type="checkbox"/>	Good natural lighting	<input type="checkbox"/>

	<input type="checkbox"/>	Ceiling insulation	<input type="checkbox"/>
	<input type="checkbox"/>	Air-conditioner(s)	<input type="checkbox"/>
F	<input type="checkbox"/>	New bathroom(s)	<input type="checkbox"/>
	<input type="checkbox"/>	Ceiling fan(s)	<input type="checkbox"/>
	<input type="checkbox"/>	Solar hot water	<input type="checkbox"/>
	<input type="checkbox"/>	Wall or floor insulation	<input type="checkbox"/>
G	<input type="checkbox"/>	Ceiling fan(s)	<input type="checkbox"/>
	<input type="checkbox"/>	New kitchen	<input type="checkbox"/>
	<input type="checkbox"/>	Air-conditioner(s)	<input type="checkbox"/>
	<input type="checkbox"/>	Solar hot water	<input type="checkbox"/>
H	<input type="checkbox"/>	Ceiling insulation	<input type="checkbox"/>
	<input type="checkbox"/>	Solar panels	<input type="checkbox"/>
	<input type="checkbox"/>	Good natural lighting	<input type="checkbox"/>
	<input type="checkbox"/>	Ceiling fan(s)	<input type="checkbox"/>
I	<input type="checkbox"/>	New kitchen	<input type="checkbox"/>
	<input type="checkbox"/>	Solar hot water	<input type="checkbox"/>
	<input type="checkbox"/>	Ceiling insulation	<input type="checkbox"/>
	<input type="checkbox"/>	New bathroom(s)	<input type="checkbox"/>

4. Which of the following features, if any, has affected/affects your decision to buy or rent a home? Please select as many options as apply.

- | | |
|---|---|
| <input type="checkbox"/> House orientation (e.g. North/East aspect) | <input type="checkbox"/> Central heating |
| <input type="checkbox"/> Double glaze windows | <input type="checkbox"/> Reverse-cycle air-conair-conditioner |
| <input type="checkbox"/> Tinted windows | <input type="checkbox"/> Ducted air-conditioner |
| <input type="checkbox"/> Draught proof windows | <input type="checkbox"/> Ceiling fan |
| <input type="checkbox"/> Draught proof doors | <input type="checkbox"/> Rooftop solar panels |
| <input type="checkbox"/> Curtains | <input type="checkbox"/> Ceiling insulation |
| <input type="checkbox"/> Internal blinds or shutters | <input type="checkbox"/> Wall insulation |
| <input type="checkbox"/> External blinds, shutters or awnings | <input type="checkbox"/> Floor insulation |

Fireplace None of the above

Other. Please specify: _____

5. Does the type of hot water system affect your decision to purchase or rent a home?

No

Yes. Which type do you seek? *Please select one option only.*

Electric Solar

Gas Heat pump

Other. Please specify: _____

6. How often do you consider energy efficient ratings when buying new appliances?

- Never
- Rarely
- Some of the time
- Most of the time
- Always

7. Please circle the number that best reflects how you would rate your household energy bill.

Very low	Low	Average	High	Very high
1	2	3	4	5

8. Would you accept a higher purchase price or higher rent if a home had a solar PV system installed? Please specify why/why not.

- No. Please specify: _____
- Yes. Please specify: _____

Please circle the number that indicates the extent to which you agree or disagree with each of the statements below.

	Strongly Disagree				Strongly Agree
Improving the energy efficiency of my home means I have to live less comfortably	1	2	3	4	5
Climate change is a problem for society	1	2	3	4	5
I don't know how to improve the energy efficiency of my home	1	2	3	4	5
The home I currently live in is too hot in summer without air-conditioning	1	2	3	4	5
A comfortable home has good natural light	1	2	3	4	5

	Strongly Disagree					Strongly Agree				
Energy saving helps reduce climate change	1	2	3	4	5	1	2	3	4	5
Improving the energy efficiency of my home is too much of a hassle	1	2	3	4	5	1	2	3	4	5
The depletion of energy resources is a problem for society	1	2	3	4	5	1	2	3	4	5
There are not enough choices of energy efficient products	1	2	3	4	5	1	2	3	4	5
The home I currently live is too cold in winter without heating	1	2	3	4	5	1	2	3	4	5
There is not enough information about how to improve a home's energy efficiency	1	2	3	4	5	1	2	3	4	5
In the past 2 years I have improved the energy efficiency of my home	1	2	3	4	5	1	2	3	4	5
A comfortable home is naturally warm in winter and cool in summer	1	2	3	4	5	1	2	3	4	5
Improving the energy efficiency of my home is too expensive	1	2	3	4	5	1	2	3	4	5

9. Please indicate below how concerned you are, if at all, that in the next 10-20 years...

	Not at all					Very much				
...electricity and gas will become unaffordable for you?	1	2	3	4	5	1	2	3	4	5
... there will be more frequent power outages?	1	2	3	4	5	1	2	3	4	5

10. To what extent do you trust each of the people listed below to provide honest information about home energy efficiency and products?

	Not at all					Very much				
Architects	1	2	3	4	5	1	2	3	4	5
Builders	1	2	3	4	5	1	2	3	4	5
Building certifiers	1	2	3	4	5	1	2	3	4	5
Electricians	1	2	3	4	5	1	2	3	4	5
Friends, family or neighbours	1	2	3	4	5	1	2	3	4	5
Government agencies	1	2	3	4	5	1	2	3	4	5
Interior designers	1	2	3	4	5	1	2	3	4	5
Plumbers	1	2	3	4	5	1	2	3	4	5
Property valuers	1	2	3	4	5	1	2	3	4	5

Property developers	1	2	3	4	5
Real estate agents	1	2	3	4	5
Retail shop staff	1	2	3	4	5
Other. Please specify: _____					

•

11. On a scale of 1 (not at all) to 5 (very much) where would you like to receive information about home energy efficiency?

	Not at all		Very much		
Through TV advertising	1	2	3	4	5
Through newspaper or magazine advertising	1	2	3	4	5
Through industry websites	1	2	3	4	5
Through government websites	1	2	3	4	5
Through visiting a home exhibition show	1	2	3	4	5
Through an energy rating tool	1	2	3	4	5
Through case studies that show the advantages and disadvantages of energy efficient products	1	2	3	4	5
By having a home energy expert visiting my house	1	2	3	4	5
By visiting an energy efficient home in my city	1	2	3	4	5
Other. Please specify: _____					

12. What is your gender?

Female Male

13. What is your age? _____

14. What is the postcode of your residence? ____ _

15. Which of the following best describes your employment status? Please select one option only.

- | | |
|--|--|
| <input type="checkbox"/> 1. Retired | <input type="checkbox"/> 6. Unemployed, looking for full-time work |
| <input type="checkbox"/> 2. Conducting unpaid work (carer/home duties) | <input type="checkbox"/> 7. Unemployed, looking for part-time work |
| <input type="checkbox"/> 3. Employed full-time | <input type="checkbox"/> 8. Studying |

4. Employed part-time 9. Unable to work
 5. Employed, away from work 10. Other. Please specify:

16. Please tick one term from the list below that best describes your household. Please select one option only.

- Single person household Couple with child/children
 Shared person household One parent with child/children
 Couple with no child/children Other family (e.g. extended family household)

17. Which of the following BEST describes the home in which you live? Please select one option only.

- A rented apartment/house
 An apartment/house with mortgage
 An apartment/house owned outright
 Public housing
 Other. Please specify: _____

18. What building type BEST describes the home in which you live?

- Detached house (not connected to another house)
 Semi-detached house (i.e. terrace, row or townhouse)
 Flat, unit or apartment
 Other. Please specify: _____

19. How old is the home in which you live (since last major renovation)?

- Under 5 years old Between 30 to 39 years old
 Between 5 to 9 years old Between 40 to 49 years old
 Between 10 to 14 years old Between 50 to 59 years old
 Between 15 to 19 years old OVER 60 years old
 Between 20 to 29 years old Don't know

20. What is the total gross (BEFORE TAX) income of your household? Please select one option only.

- Negative income
 Nil income

- Less than \$199 per week (\$10,399 per year)
- \$200 - \$299 per week (\$10,400 - \$15,599 per year)
- \$300 - \$399 per week (\$15,600 - \$20,799 per year)
- \$400 - \$599 per week (\$20,800 - \$31,199 per year)
- \$600 - \$799 per week (\$31,200 - \$41,599 per year)
- \$800 - \$999 per week (\$41,600 - \$51,999 per year)
- \$1,000 - \$1,249 per week (\$52,000 - \$64,999 per year)
- \$1,250 - \$1,499 per week (\$65,000 - \$77,999 per year)
- \$1,500 - \$1,999 per week (\$78,000 - \$103,999 per year)
- \$2,000 or more per week (\$104,000 or more per year)
- Prefer not to say

Additional specific questions for owner occupiers and investors:

21. Which of the following features, if any, have you installed in your home? Please select as many options as apply.

- | | |
|---|---|
| <input type="checkbox"/> House orientation (e.g. North/East aspect) | <input type="checkbox"/> Central heating |
| <input type="checkbox"/> Double glaze windows | <input type="checkbox"/> Reverse-cycle air-conair-conditioner |
| <input type="checkbox"/> Tinted windows | <input type="checkbox"/> Ducted air-conditioner |
| <input type="checkbox"/> Draught proof windows | <input type="checkbox"/> Ceiling fan |
| <input type="checkbox"/> Draught proof doors | <input type="checkbox"/> Rooftop solar panels |
| <input type="checkbox"/> Curtains | <input type="checkbox"/> Ceiling insulation |
| <input type="checkbox"/> Internal blinds or shutters | <input type="checkbox"/> Wall insulation |
| <input type="checkbox"/> External blinds, shutters or awnings | <input type="checkbox"/> Floor insulation |
| <input type="checkbox"/> Fireplace | <input type="checkbox"/> None of the above |
| <input type="checkbox"/> Other. Please specify: _____ | |

22. Have you installed a solar PV system in your home?

- No. Please move to Q23
- Yes. Please skip questions 24-26.

23. What was the main reason for your decision to install a solar PV system? Please tick one only.

- To save money on my power bill
- To benefit from the government rebates (ie. feed-in tariffs)
- To reduce my household carbon emissions
- To be less reliant on energy retailers
- Other. Please specify: _____

24. What is the approximate size of the solar PV system?

- _____ kWp
- Don't know

25. Did you receive any credits or payments from it in your last bill?

- No
- Yes

Appendix 2: Focus group discussion schedule and questions

Visions of a sustainable home

- What do you think of as a sustainable home?
- Look at the images of these homes: what is sustainable/ unsustainable?
- Have you intentionally bought/rented a home with sustainable features, including energy use? Why/Why not?
- What do you understand 'energy efficiency' to mean?
- *Look at these five images of different homes.* What features do you think are sustainable or energy efficient? Why? What features do you think are unsustainable or energy inefficient? Why?
- Are you interested in achieving a home that is energy efficient or sustainable? If yes, for what reasons?
- What are the words that you use to describe sustainable/ energy efficient/ energy efficient homes?
- What are the features that would be in a sustainable or EE home?
- How does your previous experience of these features influence your opinion and what you look for?

Moments of change and influence

- Do you consider whether the home has those features before you buy/rent/renovate your home? If yes, which ones? Why/Why not?
- What might influence your decision to make such changes?
- Who might influence your decision to make (or not make) sustainable changes?
- If you were to make these changes through renovations, would you do it all at once or in stages? Which ones would you make first?

Information about sustainable products/homes and mandatory or voluntary ratings

- When buying or renting, have you sought information about energy efficient/ sustainable features discussed today? Why?
- Who did you seek this information from? Why? How do you find/access them?
- What was your experience seeking this information- how easy/hard was it to find?
- Has this information influenced your ultimate decision? Why/ when would you act on this information to improve the sustainability of your home?
- How do you/ would you like this information to be available to you?

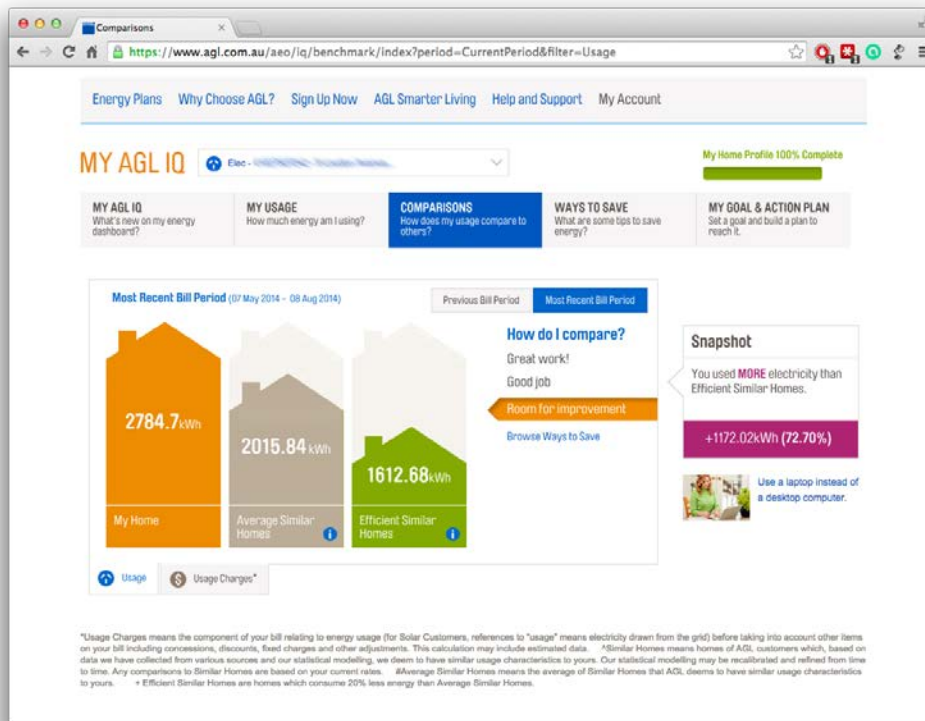
Energy rating tools

- Would you like to know energy efficient a home is before renting or buying the home?
- How would you like this information provided?
- Non-ACT: Do you think such information should be mandatory? Why? (ACT excluded)
- ACT: Are you aware of the mandatory rating system? What are your views? Why? Was it useful to you? Why/Why not (for ACT respondents only)
- If a voluntary rating system is to be implemented, would you be prepared to pay for such information? How much?
- Who do you think should be responsible for paying for the costs of providing such information?
- *Look at these three possible energy rating tools that could be provided during a home inspection (see A.3).* What do you understand from a quick review of this information? What is useful about this information in terms of presentation and content? What is not useful or easily understood?

Costs and affordability

- Do you think a home with energy efficient attributes should be a different price than a home without those attributes? Why/Why not?
- Which features are you prepared to pay more for?
- Which features are you okay to pay more upfront in order to get lower running costs long term?
- Aside from potential cost, are there are trade-offs that you think an energy efficient retrofit requires?
- Is there anything else you would like to add?

A.1 Energy rating visual tools




A.1.1 COMPARISON OF HOUSE ENERGY CONSUMPTION, FROM AGL ENERGY 'MY AGL IQ'



A.1.2 THERMO-IMAGE OF 'HEAT BLEED', FROM KNAUF INSULATION

FirstRate Report



**HOUSE
ENERGY RATING**

YOUR HOUSE ENERGY RATING IS: ★ ★ ★ ★ ★ ★ 6 STARS
in Climate: 24 **SCORE: 38 POINTS**

Name: Richard Telford **Ref No:**
House Title: Tarcombe Road **Date:** 08-02-2009
Address: 74 Tarcombe Road
Seymour 3661
Reference: C:\PROGRAM FILES\FIRSTRATE 4.0\TELFORD

Accredited Rater: Maureen Corbett VIC/03/132

This rating only applies to the floor plan, construction details, orientation and climate as submitted and included in the attached Rating Summary. Changes to any of these could affect the rating.

Appliance Ratings

Heating:	Small gas space heater (wall vented)	★
Cooling:	Not Installed	
HotWater:	Edwards 300L Solar Hot Water	★

The appliance ratings above are based on information provided by the applicant and are included for information purposes only. They do not affect the House Energy Rating of the dwelling.

18-02-09 13:27:26 Ver:4.06 Accredited Rater: Maureen Corbett VIC/03/132 C:\PROGRAM FILES\FIRSTRATE 4.0\TELFORD.1RT

A.1.3 ENERGY RATING CERTIFICATE, ACCREDITED IN THE ACT

Appendix 3: Additional survey information

Participant demographics

Table 22 Participants' residential location

LOCATION	Frequency	Percentage (%)
Sydney	25	23.4
NSW Central Coast	29	27.1
Canberra	26	24.3
Brisbane	27	25.2
Total	107	100.0

Table 23 Participants' gender

GENDER	FOCUS GROUP SAMPLE		2011 CENSUS DATA*
	Frequency	Percentage (%)	Percentage (%)
Female	67	62.6	51.2
Male	39	36.5	48.8
Not stated	1	0.9	
Total	107	100.0	100.0

*Population aged 18 and over

Table 24 Participants' age

AGE GROUPS	FOCUS GROUP SAMPLE		2011 CENSUS DATA*
	Frequency	Percentage (%)	Percentage (%)
18-24 years	5	4.7	12.2
25-29 years	18	16.8	9.2
30-34 years	19	17.8	8.8
35-39 years	12	11.2	9.2
40-44 years	19	17.8	9.3
45-49 years	14	13.1	9.1
50-54 years	6	5.6	8.8
55-59 years	4	3.7	7.9
60-64 years	0	0.0	7.3
65-69 years	9	8.4	5.6
70-74 years	0	0.0	4.3
75+ years	1	0.9	8.4
Total	107	100.0	100.0

*Population aged 18 and over

Table 25 Participants' employment status

	FOCUS GROUP SAMPLE		2011 CENSUS DATA *
	Frequency	Percentage (%)	Percentage (%)
Employed full-time	56	52.3	36.7
Employed part-time	25	23.4	17.6
Employed, away from work	5	4.7	3.6
Looking for work	0	0.0	3.5
Not in the labour force	14	13.1	33.0
➤ Retired	7	6.5	
➤ Conducting unpaid work	2	1.9	
➤ Studying	5	4.7	
Other	6	5.6	
➤ Self-employed	5	4.7	
➤ Casual employment	1	0.9	
Not stated	1	0.9	5.6
Total	107	100.0	100.0

*Population aged 18 and over

Table 26 Participants' household status

	FOCUS GROUP SAMPLE		2011 CENSUS DATA *
	Frequency	Percentage (%)	Percentage (%)
Single person household	13	12.2	12.0
Shared person household	16	15.0	4.4
Couple with no child/children	26	24.3	25.1
Couple with child/children	37	34.6	36.1
One parent with child/children	10	9.4	8.8
Other family (e.g. extended family household)	4	3.7	4.5
Other	0	0.0	4.6
Not stated	1	0.9	4.5
Total	107	100.0	100.0

*Population aged 18 and over

Table 27 Participants' home ownership

	Frequency	Percentage (%)
A rented apartment/house	49	45.8
An apartment/house with mortgage	34	31.8
An apartment/house owned outright	20	18.7
Public housing	3	2.8
Not stated	1	0.9
Total	107	100.0

Table 28 Participants' home building type

	Frequency	Percentage (%)
Detached house	70	65.4
Semi-detached house	16	15.0
Flat, unit or apartment	19	17.8
Other	1	0.9
Not stated	1	0.9
Total	107	100.0

Table 29 Participants' home building age

	Frequency	Percentage (%)
Under 5 years old	28	26.2
Between 5 to 9 years old	8	7.5
Between 10 to 14 years old	14	13.1
Between 15 to 19 years old	15	14.0
Between 20 to 29 years old	10	9.4
Between 30 to 39 years old	12	11.2
Between 40 to 49 years old	4	3.7
Between 50 to 59 years old	3	2.8
OVER 60 years old	5	4.7
Don't know	7	6.5
Not stated	1	0.9
Total	107	100.0

Table 30 Participants' household income

	FOCUS GROUP SAMPLE		2011 CENSUS DATA *
	Frequency	Percentage (%)	Percentage (%)
Negative/Nil income	0	0.0	0.7
Less than \$199 per week (\$10,399 per year)	0	0.0	4.1
\$200 - \$299 per week (\$10,400 - \$15,599 per year)	0	0.0	7.6
\$300 - \$399 per week (\$15,600 - \$20,799)	1	0.9	8.8
\$400 - \$599 per week (\$20,800 - \$31,199)	6	5.6	12.9
\$600 - \$799 per week (\$31,200 - \$41,599)	4	3.7	11.0
\$800 - \$999 per week (\$41,600 - \$51,999)	10	9.4	9.3
\$1,000 - \$1,249 per week (\$52,000 - \$64,999)	5	4.7	8.1
\$1,250 - \$1,499 per week (\$65,000 - \$77,999)	12	11.2	8.0
\$1,500 - \$1,999 per week (\$78,000 - \$103,999)	17	15.9	10.1
\$2,000 or more per week (\$104,000 or more)	43	40.2	8.1
Prefer not to say/Not stated	9	8.4	11.3
Total	107	100.0	100.0

*Population aged 18 and over

Attitudes towards energy efficiency

Table 31 Features that are most important for participants when purchasing or renting a home

	RENTERS			INVESTORS			OWNER OCCUPIERS			TOTAL		
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
Good natural light	37	1.19	1.90	37	1.95	1.68	33	1.82	1.91	107	1.64	1.844
Ceiling insulation	37	0.27	2.27	37	-0.05	1.53	33	0.48	2.28	107	0.22	2.039
New kitchen	37	0.16	1.37	37	0.11	1.501	33	0.30	1.43	107	0.19	1.422
Air-conditioner	37	0.62	2.07	37	-0.19	1.71	33	-0.15	2.00	107	0.11	1.865
Wall or floor insulation	37	0.00	2.19	37	0.38	1.74	33	-0.06	1.62	107	0.10	1.952
Solar hot water	37	-0.19	1.33	37	0.46	1.66	33	-0.09	1.77	107	0.07	1.603
Solar panels	37	-0.73	1.95	37	0.27	1.98	33	-0.52	1.82	107	-0.32	1.955
New bathroom	37	-0.30	2.30	37	-0.41	2.28	33	-0.64	2.29	107	-0.44	2.270
Ceiling fans	37	-0.84	2.09	37	-1.89	2.20	33	-1.00	1.95	107	-1.25	2.120

Table 32 Attitudes towards energy efficiency

	N	Mean	Standard deviation
Improving the energy efficiency of my home is too expensive	107	3.27	1.069
In the past 2 years I have improved the energy efficiency of my home	105	3.25	1.183
There are not enough choices of energy efficient products	106	2.83	1.073
There is not enough information about how to improve a home's energy efficiency	106	2.81	1.131
Improving the energy efficiency of my home is too much of a hassle	107	2.27	1.033
I don't know how to improve the energy efficiency of my home	105	2.20	1.013
Improving the energy efficiency of my home means I have to live less comfortably	107	1.93	0.968

Likert scale from 1 'strongly disagree' to 5 'strongly agree'

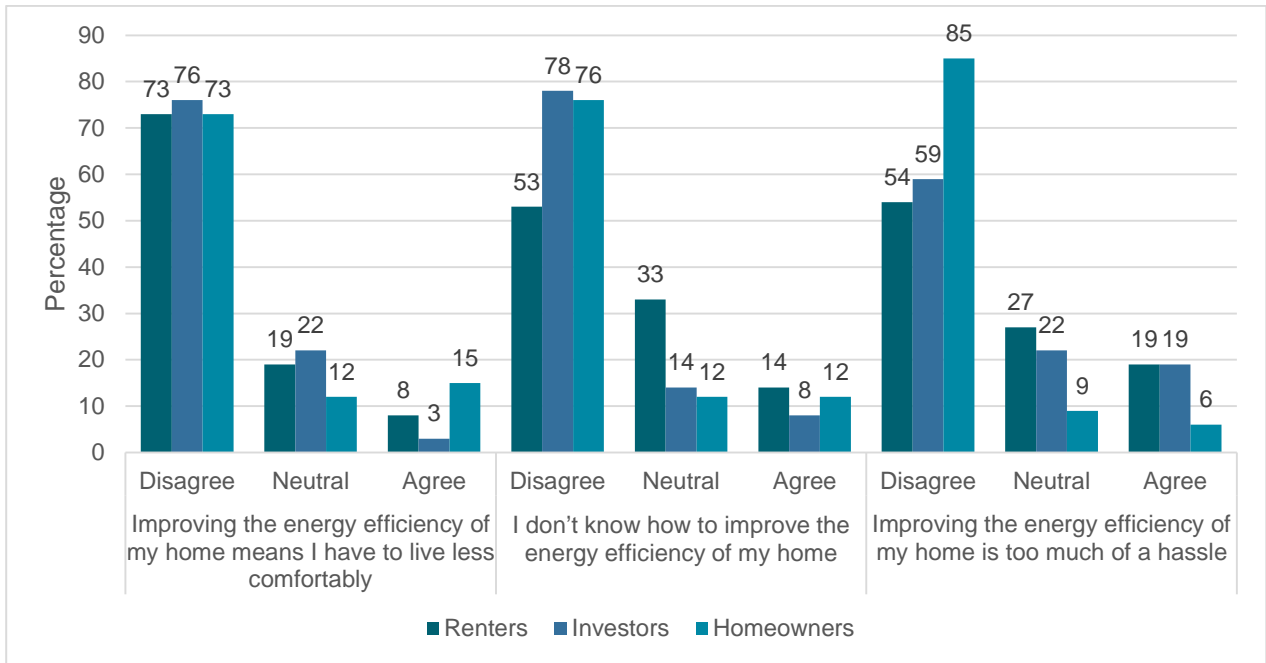


Figure 6 Frequency responses for the energy efficiency improvements statements

Table 33 Solar PV ownership*

	Frequency	Percentage (%)
No	29	90.6
Yes	3	9.4
➤ Reason for installing SPV		
○ To save money on my power bill	1	33.3
○ To benefit from the government rebates	2	66.7
➤ Size of Solar PV system		
○ 1.5 kwp	1	33.3
○ 2 kwp	1	33.3
○ 3 kwp	1	33.3
➤ Receives credit on bill from feed-in-tariff	3	100.0
Total responses	32	100.0

* Question was not included in tenants' or investors' surveys

Table 34 Consideration of appliances energy efficiency ratings*

	Renters		Investors		Owner occupiers	
	Frequency	Percentage (%)	Frequency	Percentage (%)	Frequency	Percentage (%)
Never	1	2.7	0	0.0	0	0.0
Rarely	4	10.8	1	2.7	0	0.0
Some of the time	6	16.2	5	13.5	7	21.2
Most of the time	20	54.1	16	43.2	19	57.6
Always	6	16.2	15	40.5	7	21.2
Total	37	100.0	37	100.0	33	100.0

*Question: How often do you consider energy efficient ratings when buying new appliances?

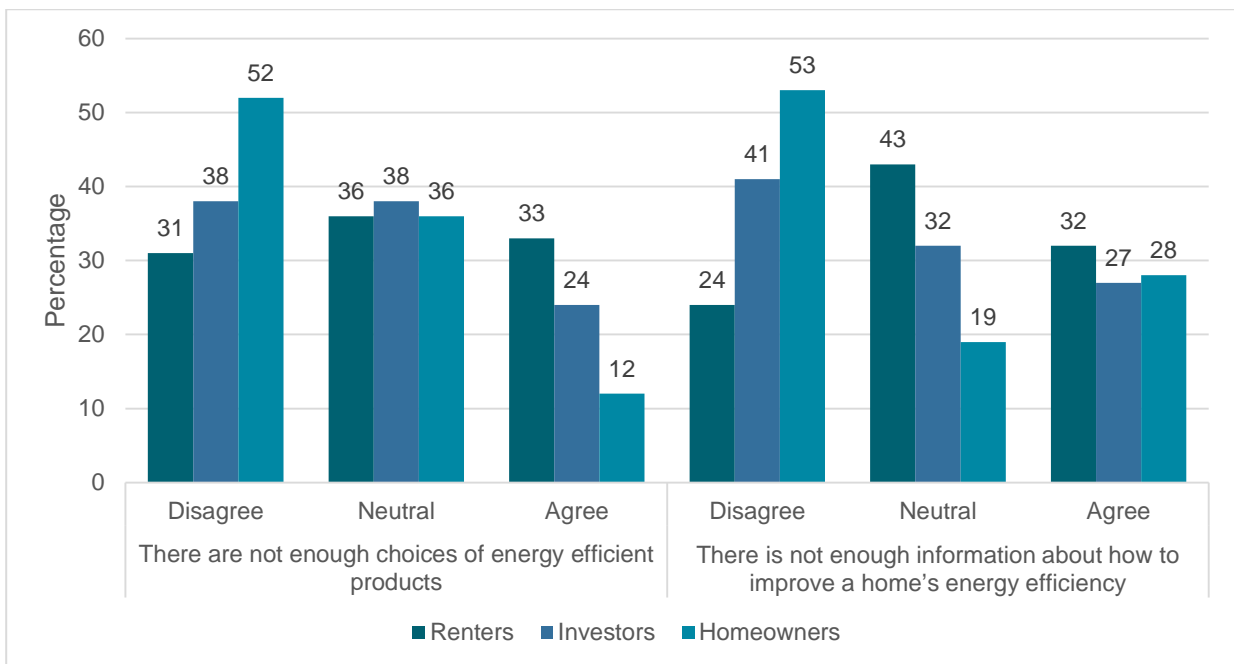


Figure 7 Frequency responses about energy efficiency choices and information

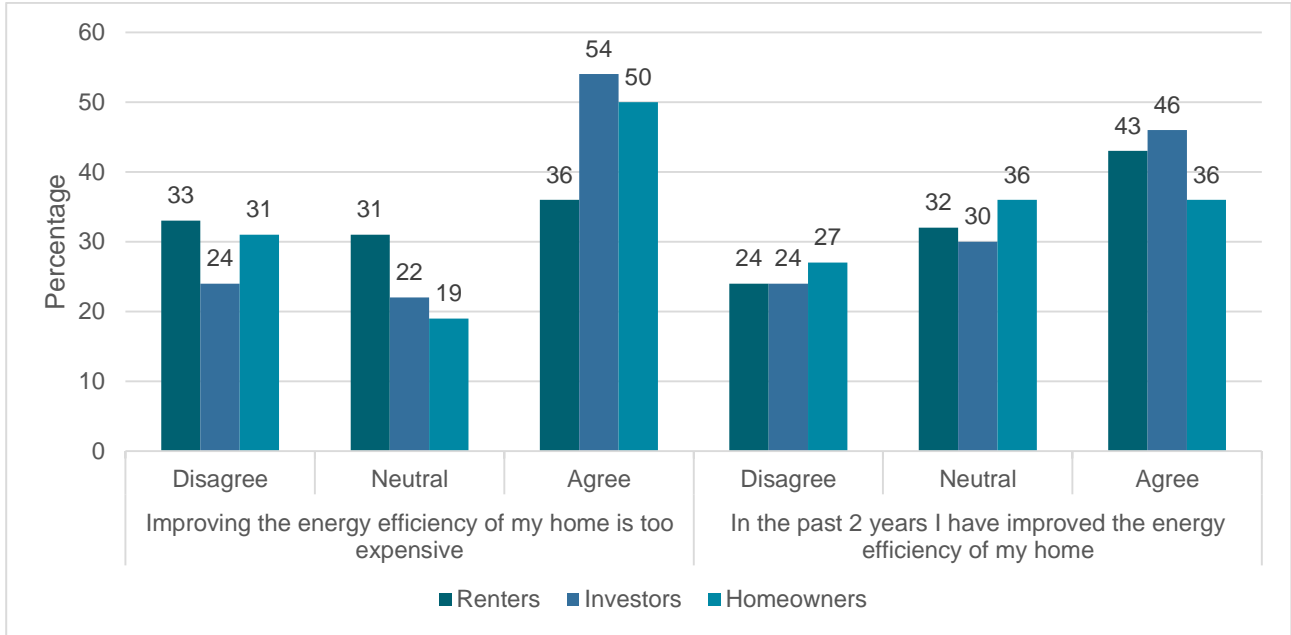


Figure 8 Frequency responses of costs and experience with home energy improvements