



**LOW CARBON LIVING
CRC**

RP3038: Lower income barriers to low carbon living Summary of focus group and survey findings



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Disclaimer

This report was prepared exclusively for the CRC for Low Carbon Living. It is not intended for, nor do we accept any responsibility for its use by any third party.

Peer Review Statement

This report has been reviewed by the Program Leader. The responsibility for what appears in this report, however, rests with the authors

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Acronyms

AER	Australian Energy Regulator
EAPA	Energy Accounts Payment Assistance
NSW	New South Wales
NSW OEH	NSW Office of Environment and Heritage
SA	South Australia
TAS	Tasmania
WA	Western Australia

Introduction

This research is designed as a follow-up to the data mining exercise (CRC-LCL RP3001) conducted by Burke and Ralston. In their report, Burke and Ralston (2015) identified rising fuel costs as a major factor in lower income household's adoption of adaptive behaviours to reducing their carbon consumption. They found that "low income households, for whatever reason, found it harder to adapt their energy budget to either rising costs or consumption needs" (Burke & Ralston 2015: 5). This was despite energy costs having risen relative to income between 1993 and 2012, and that industry liberalisation had not created new levels of fuel hardship.

The barriers that prevent lower income households to reducing their carbon consumption may, therefore, be more than financial and these households may be constrained by other factors. For example, social and private renters (as identified in Burke and Ralston (2015) as two groups particularly vulnerable to increases in fuel costs) may be constrained from modifying their homes (e.g. installing insulation) to make them more energy efficient.

The research reported in this summary of findings identifies the financial and non-financial barriers that prevent lower income households from reducing their carbon consumption. It focuses on four of the vulnerable groups identified in Burke and Ralston – single-parent families, large families of five residents or more, young single persons, and older households aged 65 or older – who may be more susceptible to changes in energy costs, and hence their ability to implement adaptive behaviours in reducing carbon consumption.

Earlier discussions with the NSW Office of Environment and Heritage (NSW OEH) also revealed that there are notable differences in opportunities for reducing carbon consumption in metropolitan and regional settings.

Current evidence suggests that most consumption-reduction schemes that target lower income households are delivered through community agencies (e.g. no interest loans schemes, or NILS) and uptake has been limited. There is also emerging evidence to suggest that some lower income households prefer dealing directly with industry though their options are often more limited without significant input and collaboration from support agencies (e.g. social landlords giving permission for installing green energy technology like solar panels).

In this research, and in addition to identifying the financial and non-financial barriers lower income households face in reducing their carbon consumption, we explore the role(s) of the non-profit sector (e.g. community and charitable organisations, support service providers, advocacy groups and community housing providers) in assisting lower income households who face energy hardship and/or are prevented from reducing their carbon consumption due to various barriers. Through the policy workshop discussions, the aim is to evaluate the effectiveness of assistance programs currently available, and provide suggestions

for adjusting these programs where necessary in order to improve their access and outcomes.

Methodology

The research takes a qualitative approach, employing four complementary methods that were designed to answer seven research questions:

1. What motivates lower income households to reducing carbon consumption at home?
2. To what extent do lower income households regard reducing carbon consumption as important, and why?
3. What practices have lower income households been able to implement to reduce carbon consumption?
4. What adaptive behaviours do lower income households make to reduce carbon consumption (including trade-offs made)?
5. What are the barriers for lower income households in reducing carbon consumption?
6. How do lower income households envisage their future ability to adopt measures to reducing carbon consumption further?
7. Why are current policies and schemes delivered through support service providers not working to expectations? What barriers do the support service providers face? How can these barriers be overcome?

Case study selection

Qualitative fieldwork was conducted in the capital cities of the four Australian states and territories of New South Wales (henceforth NSW), South Australia (henceforth SA), Tasmania (henceforth TAS) and the Northern Territory (henceforth NT) as well as four regional centres within commutable distance to these capital cities. The capital cities were chosen according to the contrasting local climate that they present, as denoted by the different climate zones in Australia (ABCN n.d.), with the 'warm temperate' zone further differentiated by the level of humidity experienced by the two cities selected for this zone. As such, the population of each field site would have contrasting energy needs, especially in relation to heating and cooling, in addition to differing bargaining powers consumers may have with their energy provider, and different levels of service access and transport connectivity.

Lower income households were the focus of this study, with an assumption that their limited financial resources represented a major barrier to their adopting of emerging energy efficient technologies. Four specific lower income groups were selected as the focus of this study: single-parent families, large families with five members or more (i.e. twice the national average of 2.6 people per household; ABS 2015), young singles aged 18 to 35,

and older singles and couples with both aged 65 or older. These groups were identified by Burke and Ralston (2015) as being especially vulnerable to energy hardship and are more likely to encounter difficulties leading to, among others, an inability to pay their energy bills. This project was designed to further explore the depth of vulnerability that these lower income households faced. The lower income threshold was set at the two lowest family income quintiles of their state/territory's capital city population.

The capital city focus groups were generally conducted in areas where there were high proportions of households with below median income. Appendix 1 shows the income distribution across the four capital cities.

Table 1 provides an overview of these field sites, the climate zones they represent, the lower income threshold of each capital city, and the number and proportion of lower income family households.

Table 1: Case study sites and selected characteristics

Climate zone		Warm temperate – humid	Warm temperate – dry	Cool temperate	Hot humid summer, warm winter
State/Territory		NSW	SA	TAS	NT
Lower income threshold*		\$1,499	\$1,249	\$1,249	\$1,999
Metropolitan	Capital city	Sydney	Adelaide	Hobart	Darwin
	No. of lower income families	462,438 (45%)	131,318 (44%)	23,266 (46%)	11,978 (49%)
Non-metropolitan	Regional centre	Raymond Terrace	Murray Bridge	New Norfolk	Katherine
	No. of lower income families	1,979 (55%)	2,361 (55%)	870 (57%)	687 (50%)
	Distance to capital city [#]	169km (2 hours)	77km (1 hour)	35km (0.7 hour)	316km (3 hours)
No. of electricity and/or gas retailers in state/ territory [^]		83	83	58	1

Note: * Lower income households are defined as those with weekly family income within the two lowest quintiles of their respective capital cities

Note: [#] indicative driving time included in brackets

Note: [^] number of electricity and/or gas retailers currently registered with the Australian Energy Regulator (AER) and indicated that they operate in the specified jurisdiction

Source: ABS (2012); AER (n.d.)

Literature and policy reviews

A review of Australian and international literature was undertaken to assess Australian and international evidence on low carbon assistance for lower income households. A review of policies and carbon reduction assistance programs (recent and/or current) across all eight Australian state and territories was also undertaken, to provide a comprehensive overview of the policies that impact on low carbon living probability of lower income households and the breadth and depth of assistance that these households may access.

Focus group discussions with lower income households

Focus group discussions were conducted with the four different lower income household groups at each of the field sites. Participants were recruited via posters

displayed on the notice boards of the local Salvation Army, community centres and other local community services as well as by referral from these organisations. A toll-free number was provided for participants to register their interest and attendance (see Appendix 2). Up to ten participants were recruited for each group discussion although in some cases registered participants brought along their partner, with the largest group involving 14 participants. These discussions focused on the participants' knowledge of carbon reduction schemes, their motivation for supporting (or not) low carbon living, the challenges and barriers they faced in reducing energy consumption, and a self-assessment of their abilities to implement further reductions. Three hypothetical scenarios – on the installation of solar panels, solar hot water systems, and the use of interest-free loans for purchasing energy

efficient appliances – were also presented to participants to test their knowledge and acceptance of such technologies, as well as the financial threshold where these schemes became economically unviable for these lower income households.

In all, 23 focus groups with 164 participants were conducted between December 2015 and June 2016. Each group discussion lasted between half to one-and-a-half hours and was digitally recorded with participant consent. Six additional interviews were conducted where interested participants could not attend the focus groups at the scheduled time or where sign-up of their respective group was low. All but one focus group discussion were then professionally transcribed; one

discussion was not recorded due to a technical issue with the recorder, with notes instead taken and typed up. Following the discussion, each participant was asked to fill in a one-page survey which asked about their gender, age group, household size, dwelling structure, tenure, energy efficient products used at home, and assistance programs accessed (see Appendix 3). Each participant was given a gift voucher at the conclusion of the discussion as a token of appreciation; fresh fruit was also provided for participants to have during the discussion or to take home to their families.

Table 2 provides an overview of our focus group participants.

Table 2: Focus group participant demographics

	Capital city	Regional centre		Capital city	Regional centre
Age group			Household type*		
18-24 years	8%	5%	Young singles (18-35)	6%	4%
25-34 years	14%	14%	Single-parent families	35%	33%
35-44 years	15%	20%	Larger households	10%	14%
45-54 years	13%	16%	Older singles and couples	49%	49%
55-64 years	10%	23%			
65-74 years	29%	16%	Main income source		
75 years or older	11%	5%	Salary/wage	11%	11%
			Retirement pensions	2%	0%
			Self-funded	0%	2%
Household income*					
1 st quintile	83%	80%	Age pension (state)	36%	29%
2 nd quintile	17%	20%	Other government allowances	52%	59%
Dwelling structure			Tenure		
Detached house	54%	63%	Rent public housing	31%	35%
Semi-detached	14%	22%	Rent community housing	9%	9%
Low-rise apartment	23%	9%	Rent privately	34%	37%
High-rise apartment	8%	2%	Own outright	19%	7%
Mobile home/caravan	0%	4%	Own with mortgage	7%	12%

Note: * recoded from completed survey data

Stakeholder interviews

Between December 2015 and May 2016, the research team conducted 14 interviews with stakeholders in the four case study states/territories (generally in the capital

cities) to gain a better understanding of the local contexts of each field site (in terms of challenges that lower income households face, availability and

connectivity to services), programs and support available to lower income households in reducing their energy consumption, barriers and challenges that the non-profit sector face in providing and sustaining these programs and support, and recent changes to public policies that have impacted (positively or negatively) on these stakeholders' ability to deliver such support. Stakeholders interviewed included support service providers, peak bodies, advocacy groups, social landlords, and state agencies. Each interview lasted between half to one hour and was digitally recorded with participant consent. As per the focus group discussions, the interviews were professionally transcribed.

Policy workshops

Four workshops with state-level policymakers and representatives of the non-profit sector will be conducted in August 2016 in each of the four capital cities. These workshops are designed to provide feedback on research findings to the project's support partners, as well as present an opportunity for discussing potential policy changes that may improve the efficiency of assistance programs currently in place.

Ethics approvals

The focus group discussions and stakeholder interviews have ethics clearance from the UNSW Built Environment Human Research Ethics Advisory Panel (approval number 155113). The policy workshops were approved under a separate application (HC16422).

Thematic analysis

Transcripts of the focus group discussions and stakeholder interviews were entered into qualitative data analysis computer software, NVivo, for analysis. Additional materials, including factsheets provided by some interviewees and notes of the focus group discussion not recorded, were also entered into NVivo for analysis. Using the seven research questions as a guide, analysis was done thematically, reflecting the challenges and barriers that lower income households face, their support (or not) of the concept of low carbon living, the types of adaptive behaviours employed, and kinds of support they would like to see implemented. Additional analytical nodes that reflect stakeholder challenges and support offered were also created. All coding was completed by one researcher, ensuring consistency.

This report focuses specifically on findings from the focus groups with lower income households and the survey as completed by the participants at the conclusion of the focus group discussions.

Preliminary findings

Understanding low carbon living

'Low carbon living' and 'carbon reduction' are not terms commonly used in everyday speech. As such, these terms were seldom used during our focus group discussions and interviews. Instead, 'energy efficiency', 'reducing energy use' and 'renewable energy sources' were regularly used in their place. This substitution of terms was more relatable, especially to focus group participants who may be less familiar with the more technical terminologies. Furthermore, within the Australian context where the main method of electricity generation is through coal-fired generators, a reduction in energy use or achieving a greater level of efficiency would contribute greatly to lowering domestic carbon consumption.

During the focus group discussions, however, we asked the participants three questions specifically using the term 'low carbon living':

1. if they understood what the term 'low carbon living' means,
2. whether they supported the idea of low carbon living, and
3. why they supported (or not) the idea of low carbon living.

Likewise, in the stakeholder interviews, we asked our participants if they thought the term 'low carbon living' would be easily understood by their clients and/or the population more generally.

Overall, most focus group participants only had a vague understanding of the term 'low carbon living'.

This general lack of understanding of this more technical term is highlighted by this participant: *"I didn't even know for that, for the carbon and where it comes from. I didn't know that"* [single-parent, NT].

When asked how they would define the term 'low carbon living', the most common definition given by our focus group participants related to a reduced consumption of energy, especially electricity. Another common definition involved switching to renewal energy sources, particularly solar power.

Only very few participants were already familiar with the concept of low carbon living, and defined it as reducing their carbon footprint through a combination of reduced consumption (of fuel and consumable products) and switching to renewable energy sources.

Speaking with stakeholders, most of our interviewees also believed that their clients, generally socioeconomically disadvantaged households, would have difficulty understanding the term 'low carbon living'. They explained that for many lower income and socioeconomically disadvantaged households, their main focus would be on surviving day-to-day living, with many living paycheck to paycheck with little time and

money left for environmental concerns. Carbon consumption, and low carbon living, would therefore not feature prominently in their day-to-day considerations or vocabulary.

Support for low carbon living

When asked if they supported the concept of low carbon living, following a brief explanation by the facilitators on what low carbon living may encompass, the majority of our participants showed support for this concept. Only a small number voiced their scepticism, noting it as a marketing gimmick or propaganda.

When prompted further about why they supported low carbon living, responses predominantly focused on the future generations. This was especially the case amongst our participants who have children and grandchildren, as this single mother explained: *"I think of it for my kids. My kids. My grandkids"* [single-parent, TAS].

For some others, their support for low carbon living was predicated on a cleaner, healthier environment: *"It's going to run out one day. [...] It's going to stop sometime and we use oil for lots of other things – you know, coal, whatever apart from generating electricity"* [single-parent, SA].

For a small number, they associated low carbon living with less pollution, and adopting low carbon living would mean an improvement in their physical health: *"I don't want to end up with asthma. [Facilitator: so health reasons?] Yeah, health reasons. We've already got one foot in the grave, we don't want two"* [older single, TAS].

For a few of our participants who supported low carbon living for environmental reasons, they also thought/hoped adopting low carbon living would lead to lower cost of living: *"Yeah, we're hoping it's a good idea, that our electricity will maybe go down a bit"* [single-parent, SA].

Cost of energy in Australia

The majority of participants noted limited finance as the main barrier to their transitioning to lower carbon living. This resonates with earlier Australian research which highlights energy hardship as a significant barrier to the uptake of more energy efficient and low carbon technologies (Burke & Ralston 2015; Chester & Morris 2012).

There was great variability in terms of the cost of energy our lower income participants paid on a regular basis. Very few (mostly single persons) paid less than \$200 per quarter, with most typically having quarterly bills of between \$400 and \$700. In a few extreme cases, their quarterly electricity bills could mount to well over \$1,000. This is especially so in the NT during the wet, summer season, where the combination of high temperature and high humidity means the use of air-conditioning is necessary: *"I pay \$1,200 every three months. That's just in electricity"* [single-parent, NT]. Another of our NT participant recalled a friend having once received a

\$3,000 quarterly bill at the end of the wet season; this kind of story was also confirmed by several of the stakeholders interviewed.

Most participants noted that energy bills are the third-highest household costs after housing (i.e. rent or mortgage) and food.

As a result of high energy bills, lower income households often go to extreme measures trying to keep their costs down. Typical compensatory behaviours include:

- **selective heating and cooling**, such as only heating/cooling one room, delay turning the heater/air-conditioner on by first adjusting their attire or using blankets to keep warm;
- **reducing usage**, such as not having lights on, only keeping the hot water system on for a couple of hours each day, doing their washing during off-peak tariff hours, and rationing TV viewing hours;
- **find alternative heating/cooling methods**, including using wood-burning fireplaces, going out and staying in shopping centres, charitable organisations, work places etc.;
- prioritising bill payments and **seeking assistance on other essentials** such as food and medication.

All of these compensatory behaviours resonate with international evidence, such as those presented by Brunner, Spitzer and Christanell (2012) in their Austrian study.

In a later section, we discuss the types of energy-related assistance programs that lower income households access and their views on the programs' efficiency.

Despite the large amounts many of our participants regularly spent on utility bills, most Australian households do not fall into fuel poverty under international standards. By the UK definition, which defines fuel poverty as more than 10% of a household's income being spent on energy, Simshauser, Nelson and Doan (2011: 66) found that households in none of the five income quintiles spent, on average, more than 7% of their disposable income on energy. There was, however, notable differences across the quintiles, with those in the higher quintiles spending proportionately less of their income on energy.

This finding resonated with Burke and Ralston (2015), with both research teams calling for an Australian-specific definition for fuel poverty (or energy hardship) as an important benchmark for any future studies. The findings included in this report, therefore, more readily reflects a qualitative assessment of energy deprivation that lower income households experience across different Australian cities as reported in Anderson, White and Finney(2012).

Energy efficiency measures currently undertaken at home

In the post focus group survey, we asked each participant to indicate if their residence included any of the 15 low carbon (e.g. solar hot water system) or more carbon-dependent (e.g. wood-burning fireplace) household products (see Appendix 3, question 8). On average, each household had between 3-4 of such products, typically including a mix of low carbon and more carbon-dependent products.

Most commonly, lower income households have an electric cooktop and/or oven at home (68%), with many explaining that gas is not available in the areas where they lived. Most, however, recognised that gas is a cheaper fuel source and has a lower carbon footprint. A small number of our participants explained that – more typically for economic rather than environmental reasons – they purchased refillable propane gas bottles for cooking on barbeques, or butane gas bottles for cooking on camping stoves instead of using their electric cooktops and ovens.

Some participants also talked about the microwave being their main cooking implement, and batch-cooking several meals at a time, therefore reducing their need to using the cooktops/ovens to at most once or twice a week.

The most common low carbon product that lower income households had at home were low energy light bulbs (63%). Lower income households typically first acquired these light bulbs via home audits and giveaways (see next section on access to assistance programs), but quite a few also took the initiative and purchased these themselves. Many had also purchased and replaced some of their low energy bulbs when the free ones no longer worked, noting that the complimentary ones that they received may have been of inferior quality as they did not last very long. Some participants also noted that the electrical wiring in their homes may be out of date, and therefore electrical appliances (energy efficient or otherwise) may not last as long.

One of our stakeholders explained that such energy efficient light bulbs are the 'low hanging fruit' that people can more easily implement. This stakeholder also explained that while the energy savings achieved via the light bulbs alone were significantly lower than items such as energy efficient whitegoods and insulation, they allowed lower income households to feel that they were contributing to carbon reduction in what small ways they could.

The uptake of most other low carbon household products were, therefore, generally significantly lower compared to the use of low energy light bulbs. For

example, only 39% of our participants had low energy whitegoods at home. As this NSW participant explained:

You can go to ALDI and get a fridge for \$200, but it might not have the same stars as if I go to Harvey Norman and get the one with the five stars. But it's \$800.

It's like well it's either \$200 or \$800. I have to go with the \$200 because I don't have the money to go and buy the expensive one. [young single female, NSW]

Table 3: Types of energy efficiency measures currently employed at thome

	NSW	SA	TAS	NT	Total
Low carbon					
Low energy light bulbs	56%	60%	84%	58%	63%
Low energy whitegoods	27%	44%	49%	67%	39%
Ceiling insulation	14%	30%	51%	25%	27%
Ceiling fans	16%	33%	22%	67%	25%
Heat pump hot water system	14%	19%	27%	17%	18%
Skylight	7%	14%	11%	0%	9%
Solar electricity panels	7%	5%	14%	8%	8%
Solar hot water system	4%	5%	5%	42%	7%
Whirly birds	6%	0%	3%	0%	3%
More carbon-dependent*					
Electric cooktop/oven	64%	70%	73%	75%	68%
Electric heater	46%	42%	59%	17%	45%
Gas cooktop/oven	31%	21%	11%	0%	21%
Gas heating	13%	7%	19%	8%	12%
Fireplace (wood burning)^	6%	7%	24%	0%	10%
Oil heating	4%	2%	3%	8%	4%

Note: % expressed as percentage of total participants in each jurisdiction

Note: * based on assumption that in Australia (except in TAS) electricity is predominantly produced by burning coal, and therefore a more carbon-dependent process.

Note: ^ Wood-burning (and other biomass electricity generation) is noted as having less than half life cycle greenhouse gas emission than fossil fuel electricity generation but higher than other renewable sources (between 10-100 times higher; Stephenson & MacKay 2014). We have, therefore, classified it as a more carbon-dependent practice.

Several participants also noted that some of the whitegoods that they had were secondhand items provided by charities or purchased cheaply, and they had little to no choice as to whether they may be energy efficient or not. Some participants knew of assistance programs such as no interest loan schemes (NILS) and had taken advantage of that to purchase more energy efficient household products (see next section on assistance programs accessed by lower income households).

Hot water systems were noted as another household product that used a lot of electricity. Several participants spoke of switching their hot water systems off when not in use, and only switching them on half to one hour before hot water was needed and switching them off again straight after in an effort to keep costs down. There were also several participants who said they turned the temperature setting of their hot water system down to the minimum safety level (60°C) in view of the

system using less energy, with a small number even going below this minimum level (to around 45°C) in order to save more.

As can be seen in Table 3, relatively few of our participants had energy-efficient hot water systems such as solar or heat pump. They noted this was especially an issue with respect to tenure, that solar or heat pump hot water systems were generally not something that their landlords were willing to invest in. As a result, only 7% of participants had solar hot water and 18% had heat pump hot water systems.

Of all the low carbon products we asked our participants about, solar electricity panels had one of the lowest uptakes nationally (8%). This was noted by our participants as being due to a combination of financial and non-financial factors. As highlighted in Table 2, many lower income households rent, and these

participants noted the unwillingness of their landlords to install solar panels as a major barrier.

A very small number noted that even when their landlord had installed solar panels on their roof, electricity generated was fed back into the grid by their landlord for the feed-in tariff rather than being used by the tenants. As a result, none of our participants who rented had direct access to solar electric power.

Amongst our homeowner occupants, one-third had installed solar electricity panels. These participants recalled a combination of conservation and financial reasons for installing these panels, with some wanting to reduce their carbon footprint, and others seeing it as a way of reducing their electricity costs; a small number cited both as motivations. The outcomes of their experiences in installing and switching to solar electric power were, however, mixed. The majority noted a significant reduction in their electricity costs, with some even able to come into credit (particularly in the summer months in the southern states) when returns from feed-in tariff was taken into account. Several, however, noted that they were yet to recuperate the initial outlay costs (which in some cases were quite substantial), and had to outlay more in the time since installation when parts broke and needed to be replaced:

“Participant 1: When you buy solar, they can give you 20 years guarantee on the panels but they only give you two years’ warranty on the main unit that handles electricity from the solar to the grid.

Participant 2: Well actually, ours went three times.

Participant 3: Ours went after 11 months.” [older singles and couples, NSW]

Some of these homeowners spoke of accessing solar rebate programs such as the Solar Homes and Communities Plan and more recently the Solar Credits Program to help them with the initial purchase and installation costs of the panels; one participant said she received her four panels for free as part of a home show promotion but this was an isolated case (see next section of assistance programs accessed by lower income households).

Homeowners who did not install solar panels in their homes cited the substantial initial outlay and the number of years between initial investment and the break-even point as major barriers to their switching to solar power. As this participant explained: *“what they worked out for me fairly recently, that it would take me 12 years to get back in front and I would have to borrow the \$7,000 to start off with” [older single person, NSW].* Some said that even if they were about to access some assistance, the initial costs could still be quite significant and may not be an affordable option for many households: *“Mine [solar panels and battery system] cost \$14,000. That was with a \$4,000 rebate” [single-parent, NT].*

Differences across jurisdictions

There are notable differences in uptake of low carbon products across the four jurisdictions. While 27% of households that participated in our research had ceiling insulation in their home, uptake was far higher in TAS (51%) than all other jurisdictions, especially NSW (14%). This reflects TAS’s generally colder climate and the housing stock having been traditionally built specifically to suit the local climate conditions. Some participants, however, were unsure if their homes were insulated. This was especially true amongst renters, who generally guessed their homes were not insulated because they live in low cost housing.

Likewise, 25% of participants had ceiling fans at home, with a significantly higher proportion of NT participants (67%) having them than in the other jurisdictions, again reflecting the warmer and more humid climate in NT and the long tradition of incorporating ceiling fans as part of tropical housing design.

The most stark contrast is noted in the use of wood-burning fireplaces, with 24% of TAS participants having at least one at home, while 0% of NT participants had one, reflecting the vastly different heating and cooling requirements of the four case studies.

Many TAS participants noted wood-burning fireplaces as an economic way to heat their homes during the colder months – *“I would buy two tonnes of firewood twice a year and my power bill was about this big. Now at this house it’s, and it’s two storeys, small and two storeys. Nowhere to put a fireplace that would be efficient and the power bill has gone up because of electricity” [older couple, TAS].*

As the majority of electricity in TAS is produced through hydropower (and therefore carbon neutral), the high cost of electricity has meant that some lower income households have resorted

to more carbon-dependent alternatives (such as wood-burning fireplaces) in an effort to keeping their costs down.

There were also jurisdictional differences in the uptake of solar technology. Solar hot water systems were more readily used in the NT (especially in regional and remote areas), while heat pump was more common in SA and TAS. Participants with heat pump hot water systems were also more likely to be social renters, benefiting from their landlords' initiatives. A small number of these participants, however, noted that they were not getting water as hot as from other heating systems, but this might be due to temperature settings being set too low accidentally.

One CHP that we spoke with noted that the heat pump technology is relatively new to NSW, and they had recently invested resources to learn more about the technology as a means of supporting their tenants in

transitioning to lower carbon living and also lowering their overall regular expenditure.

Assistance programs available

Through our program reviews, a large number of assistance programs are available to help lower income households regarding their energy use. These typically come in two forms: (1) assistance with their bill payment, and (2) rebates or subsidy for purchasing low carbon products.

In the survey, we asked our participants about the type of assistance programs they had accessed regarding their energy use. These were grouped under five specific categories (see Appendix 3, question 10). The results are included in Table 4 below.

One of the most common assistance program our participants recalled accessing was light bulb exchange, or energy efficient light bulb giveaways (34%). Participants note they either received them when consultants from electric companies knocked on their doors, or as part of a free power and water-saving pack, generally from stalls they came across in shopping centres. A small number also received these packs as part of the energy audit that they received.

Table 4: Types of assistance programs accessed by participants

	NSW	SA	TAS	NT	Total
Assistance to pay gas/electric bills	39%	37%	24%	42%	35%
Light bulb exchange	37%	37%	35%	0%	34%
Energy audit/consultation	24%	9%	22%	0%	18%
Solar panel subsidy*	16%	12%	19%	0%	14%
Fridge buy-back	3%	5%	8%	0%	4%
Other	3%	0%	0%	0%	1%

Note: % expressed as percentage of total participants in each jurisdiction

Note: * includes solar hot water system rebate schemes

Participants were generally positive about the energy efficient light bulbs and packs they received, noting that they had helped reduced their electricity costs, though this was mostly only marginal. Several participants were particularly positive regarding the energy saving power boards they received as part of the packs, which switched off all 'slave' appliances (e.g. DVD player) when the main appliance (typically a television) was switched off. Others, however, were less positive, especially if they were the self-timed ones that switch off automatically after a pre-determined time period. Several of these participants had thrown them out in frustration:

"Participant 1: Guess where they ended up? The bin.

Participant 2: Yeah, I threw mine off the top of the roof.

Participant 3: I threw mine too." [young singles and single-parents, SA]

Another type of assistance program commonly accessed by our participants was financial subsidies and rebates on their utility bills (35%). Such rebates and subsidies can take several forms, including the federally-funded energy supplement (accessed via Centrelink); some jurisdictions provided additional on-going and/or one-off supplements, such as NSW's Energy Accounts Payment Assistance (EAPA) vouchers. Many participants who received the energy supplement said that, once they had applied and had been approved, the supplement was typically automatically deducted from their electricity bill.

Most of our participants said that 'every little bit helps' but noted that such energy

supplements often only amount to a very small proportion of their bills, and that they still regularly struggled to keep up with the costs and increases.

In many cases, participants had entered into payment plans with their energy provider, making smaller fortnightly repayments (\$30-\$50 typically) rather than larger quarterly lump sums. Most who entered into such payment plans found them beneficial in helping them budget better, noting that it would be near impossible for them to pay the quarterly lump sum. Several said that such payment plans took away financial resources on too regular a basis, which they could have used for food or otherwise. Several participants also said that they prioritised paying their utility bills, and if needed sought assistance in other aspects such as going to soup kitchens for free meals or receiving food parcels from charitable organisations.

While in general most lower income households are eligible for energy supplements, some were unsure if they actually received such rebates. When asked if they received any kind of assistance, quite a number of our participants noted that they received regular discounts from their energy provider off their bills. When prompted further by the research team, or from other participants in the focus groups, these were often revealed to be federal or state-funded energy supplements. This was especially the case if the participant was making fortnightly payments that were automatically direct debited from their bank accounts. Likewise, many of these participants understood their energy consumption by the dollar amount they had to pay, with little knowledge of actual usage levels, and often little recollection of whether or not they received subsidies or rebates.

On this basis, we estimate that more than 35% of our participants were in fact in receipt of some kind of financial assistance with their utility bills.

Across the four jurisdictions, there were significant differences in the uptake of assistance programs. This was most starkly highlighted in the NT, where no participant recalled participating in any assistance programs other than financial subsidies. Several participants and stakeholders we interviewed stated that NT residents often missed out on programs compared to other jurisdictions, as the NT is governed more directly by the Commonwealth and does not have a State Government that could provide additional support. Such a one-sided account in the NT, however, may be slightly misleading. One single-parent who said in the focus group that she received a \$4,000 rebate for her solar electricity panels did not identify as such in the survey form.

Information on assistance programs

One barrier that was brought up in all the focus group discussions was lower income households' lack of access to relevant information, especially relating to assistance programs that they may be eligible for.

Generally, lower income households found assistance programs were not well publicised. Most commonly, they learned of assistance programs by visiting charitable organisations. A typical story would be a lower income individual going to a charitable organisation for assistance in paying their utility bill, from which they were offered a suite of additional assistance such as financial counselling, payment plan brokerage with their energy provider, and information about on-going support.

The most common type of information lower income households knew of regarding their energy use was bill assistance.

Many lower income households had little knowledge of other types of assistance available. Some knew of NILS but few had made use of it; most had not heard of an energy audit or consultation, and fewer still knew of fridge buy-back schemes.

A number of suggestions were made by our participants in terms of improving lower income households' access to assistance programs. These included:

- including information leaflets in their utility bills;
- having leaflets at charitable organisations and community facilities such as libraries;
- social media;
- radio and television advertising; and
- for lower income renters, an information package when they first move into their new home.

Implications beyond carbon reduction

The significant cost of utility bills that some lower income households bear has a number of implications for their quality of life. These implications can be broadly categorised under health and social wellbeing.

On health

Our focus group participants noted their prioritising of utility bill payments had a number of implications on their health. Most commonly, our participants reported having skipped meals, reduced their grocery bills by consuming less per meal, or purchased lower quality products. This participant recalled a particularly dire situation:

"I mainly skip meals. I've gone four days without eating. Because I've had a bill I've got to pay. I've had three days when I've had six spoonfuls of sugar each night and that's my tea. It's just a matter of having to get by. Other than that it's going to work without food." [older single, TAS]

A small number of our participants had even gone so far as skipping medication, noting that it was too expensive to refill on a regular basis, or they found cheaper alternatives.

As these participants explained:

"I have a small skin cancer on my chin and the doctor gave me a script of cream. When I went down and got it filled, I had to actually ask them to take the label off and put it back in stock because it was \$16 instead of the normal \$6.10 because it wasn't on the PBS." [older single, NSW]

"Well you get cheaper medications." [older single, SA]

Some, however, considered medication too important a sacrifice to make and instead tried reducing their costs elsewhere: *"I consider medication to be too important. We make sure we have our medication"* [older couple, NSW]

For many other participants, the foregoing of comfort (not having heating and cooling) can also have impacts on their health. A number of mothers spoke of their inability to afford regular heating meant that their children got sick more often; some of our older participants also said that sacrificing comfort to keep their heating and cooling bills down could diminish their quality of life, as this asthmatic participant explained:

"I've got asthma but I have heart problems as well. During the summer when it's humid, I can't breathe. So I have to, as I said, the fans going. But I do as this lady said, I close all the blinds and try to keep the heat from coming in. So when I have the fans going, it's actually a little bit cooler. But yeah, I do have a lot of breathing problems with summer. In winter of course, the chill gets

in. I had pneumonia three times last year. So yeah, the heating is definitely a must" [older single, NSW]

On social wellbeing

Inability to keep up with increasing energy costs not only had impacts on our participants' physical health but also their mental and social wellbeing.

A number of our participants said their regular need in asking for help can be embarrassing, while others said that out of pride they would rather struggle through than ask for assistance.

This mentality of struggling through rather than asking for help is apparent amongst young and old. As a result, their quality of life was often compromised, or they missed out on practical assistance rather than a handout that could have helped them help themselves:

"Participant 1: Not a lot of people like to ask for assistance. I can't speak for everyone, but I know as a male, I don't like to ask for help or assistance.

Participant 2: Yeah, me to.

Participant 1: I'd rather struggle than ask for assistance.

Facilitator: It sounds like you all feel that way, do you?

Participant 3: Yeah. Coming from working fulltime, with a fulltime job, to having nothing, is well I've always been able to rely. I've always been able to pay my bills and put petrol in my car and buy food and stuff. Now not to be able to do that, it's kind of embarrassing, isn't it? I don't really want to ask anybody for help" [young singles, NSW]

"Participant 1: We come from a different time where you don't ask for charity.

Participant 2: We learn to juggle and you might say, well I've got this bill come up I won't buy – I don't buy groceries at all if I get a big bill. I try and make that, last week's groceries last for a fortnight, or three weeks sometimes. We're too proud.

Participant 3: Yeah, you don't ask for charity" [older singles, TAS]

Most of our participants recalled having missed out on social interactions: *"You can't go and have... go down the street and have a coffee, a cappuccino and a muffin or something"* [older single, SA]. Some even had to miss out on important family events because prioritising utility bills meant there was little left in the budget, as this single mother, who lived two hours' drive from her older children, explained:

“My older children live down south and I have to budget for once a month to go see them. My eldest daughter had a birthday and my other one has one on Saturday, her 21st and I can’t see them for their birthdays because I can’t afford it because I’ve got to go down on Christmas so I’ve got to budget the money so that I can only do once a month go down and see them. My youngest daughter, she’s pregnant, just about to have a baby. I won’t be able to go and see that baby unless it’s in that week where it’s budgeted. She wants me to be there when the baby’s born and unless it’s in that week it’s not going to happen” [single parent, SA]

Several mothers spoke of their children missing out because of their limited budget. This included social activities, school activities, and also holiday celebrations, as these two participants explained:

“Participant 1: At Easter, I feel ashamed to say it but my daughter got one Easter egg. One round egg. That’s all I could afford for her. It’s just...”

Participant 2: My kids got nothing” [single parents, NSW]

Conclusion

Through a combination of survey analysis and focus group discussions, we discovered that many lower income households – whether young singles, single parent families, large families, or older singles and couples – regularly faced difficulties in meeting their energy costs. This is despite literature noting that, on average, no Australian households fell within the international definition of energy hardship, where more than 10% of disposable income was spent on energy. These previous studies, however, defined energy hardship only as a proportion of disposable income spent on energy without taking into account lower income households' other expenditure. With Australia being persistently ranked as one of the countries with the highest cost of living globally (Janda 2015), the financial pressures on lower income households to provide for themselves are consequently high. Defining energy hardship as a proportion of disposable income without taking other factors into account may be too simplistic a calculation.

We extend Simhauser, Nelson and Doan's (2011) call for a new definition of energy hardship. We propose, however, that rather than having an Australia-specific definition, a more comprehensive definition that takes into account other essential expenditure such as food and transport may be more appropriate.

Lower income households nominated a range of financial and non-financial factors as major barriers that prevented them from transitioning to low carbon living more fully. These included rising energy costs, income not keeping up with rising costs of living, costs of introducing energy efficient/low carbon products, their housing tenure, and difficulty in accessing information. As a consequence, a range of compensatory behaviours was introduced, including selective heating and cooling, skipping meals and at times medication, and missing out on social activities. All of these have significant impacts on their physical and mental health.

While most of our participants acknowledged that help was often at hand, the bill concessions they received were not enough to help them maintain a minimum standard of living. Information about, and promotion of, assistance were also often lacking, or were only available on mediums such as the internet that lower

income households either did not have the means to access because of cost prohibition or the skills and knowledge to do so. For many lower income households, their tenure (the majority being renters) and lack of cooperation from their landlords presented additional barriers to their taking up of some forms of financial assistance such as solar panel rebates. There were also notable differences in access to assistance across the jurisdictions, with some providing additional concessions and rebates for lower income households, and others not.

Concessions and rebates, however, only helped in alleviating some financial pressures of lower income households, they did not act effectively as a means of transitioning these households to low carbon living.

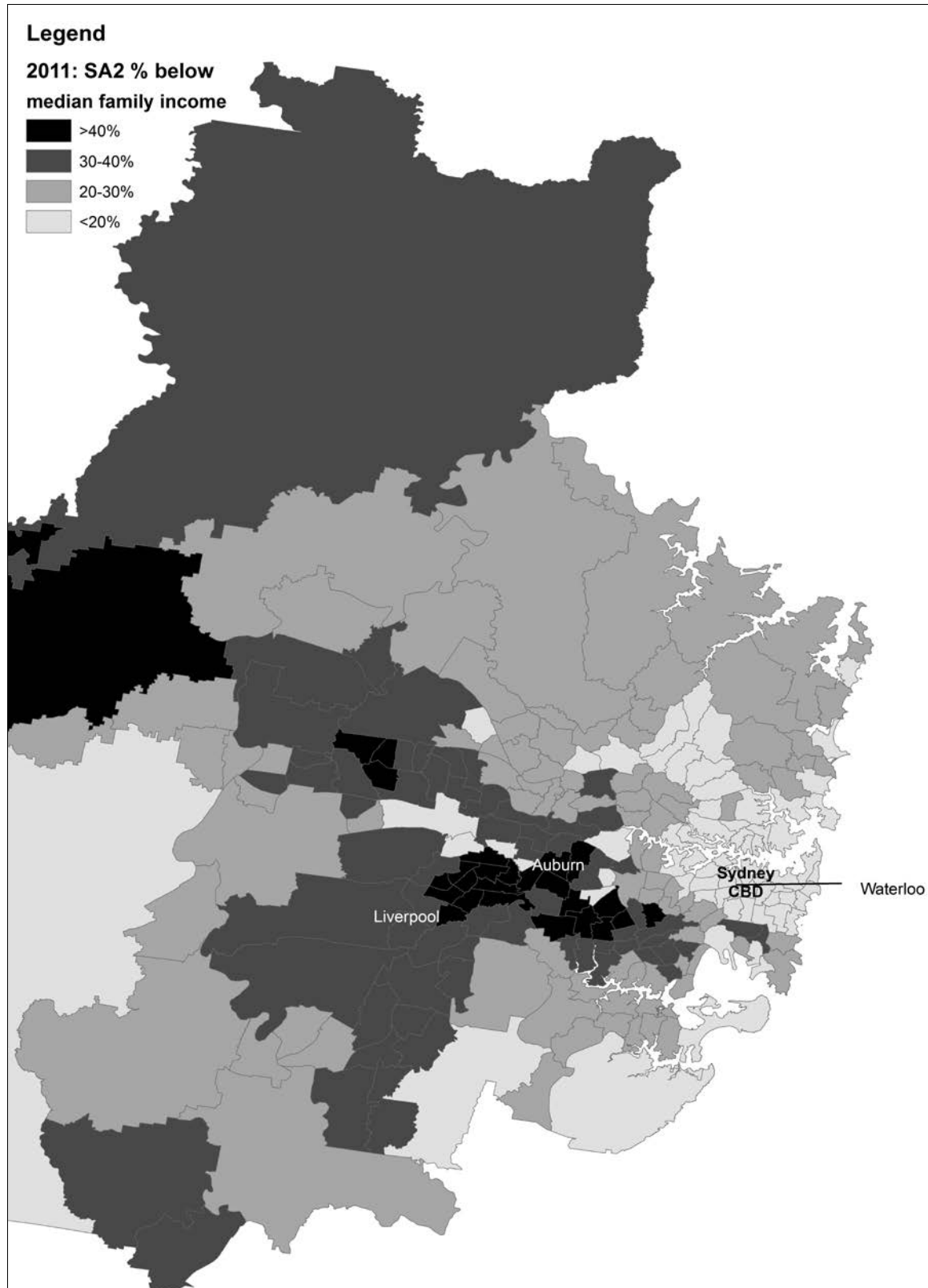
As many of our participants suggested, a hand-up rather than a handout is what they want.

To do this, reliable and easy to access information is required. Our participants provided a range of suggestions on how these could be achieved. We will discuss these suggestions with stakeholders (state agencies and service providers) during our upcoming policy workshops.

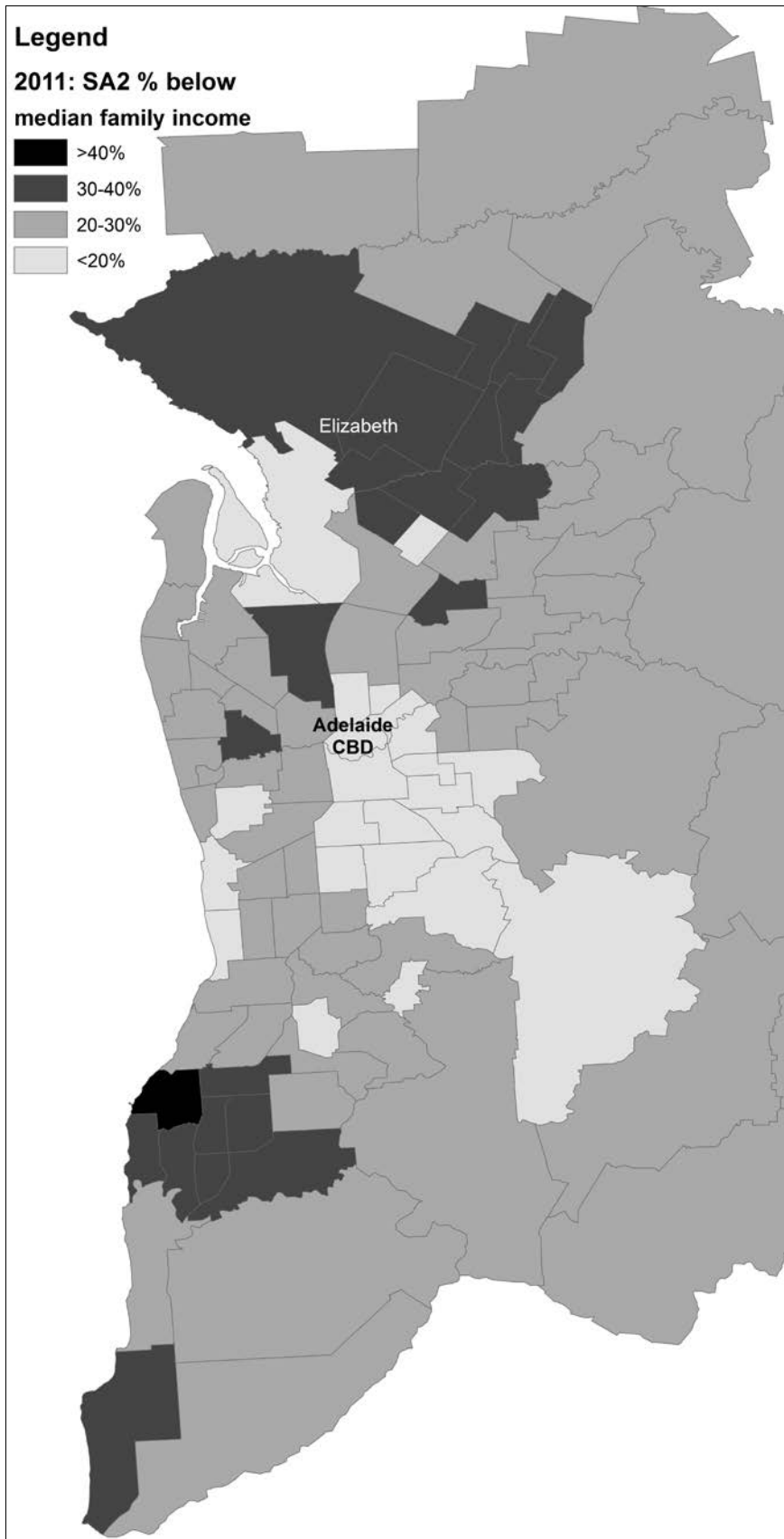
Appendices

Appendix 1: Proportions of households in SA2 with below median weekly income, Sydney, Adelaide, Hobart and Darwin, 2011

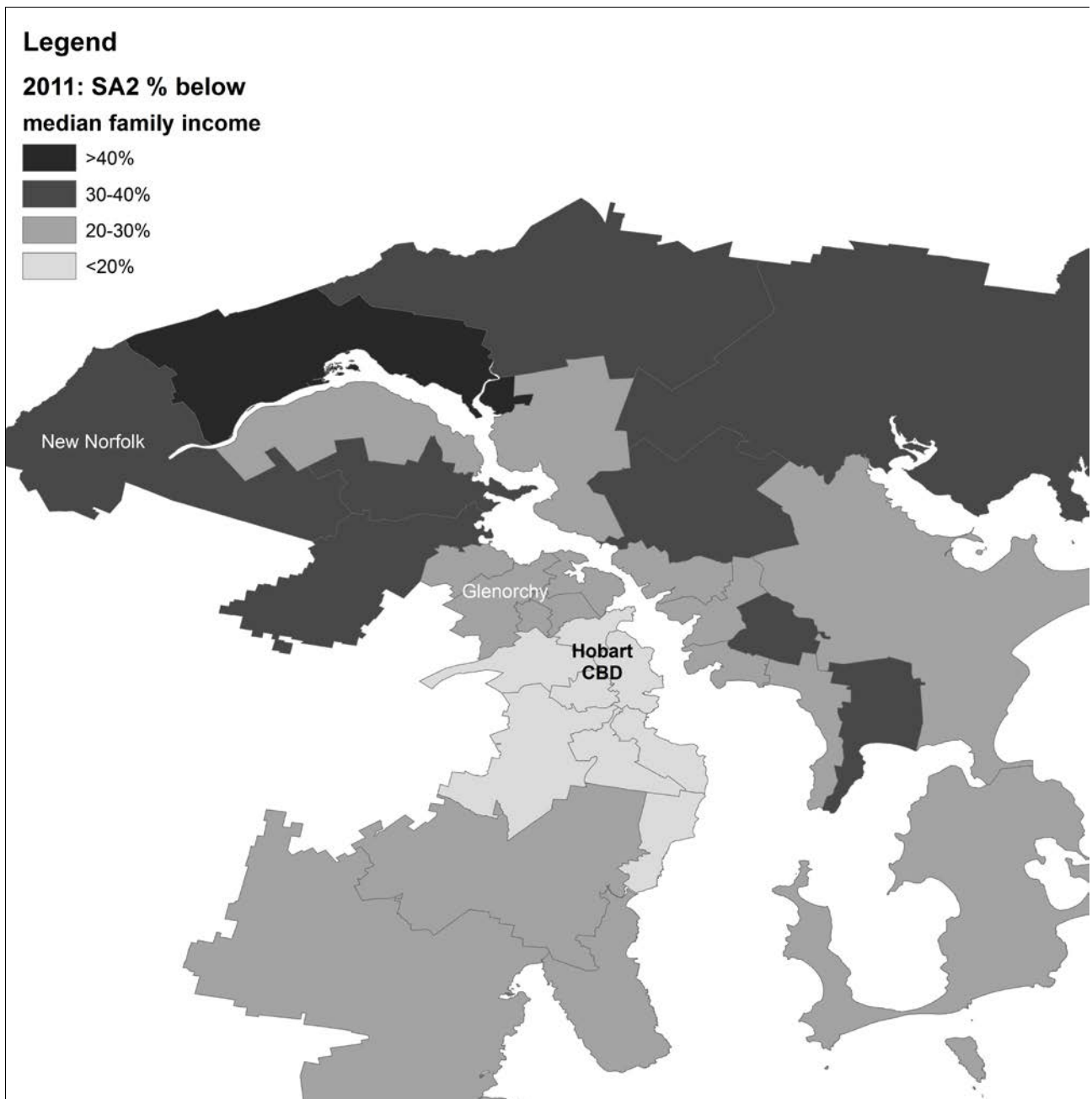
(a) Sydney



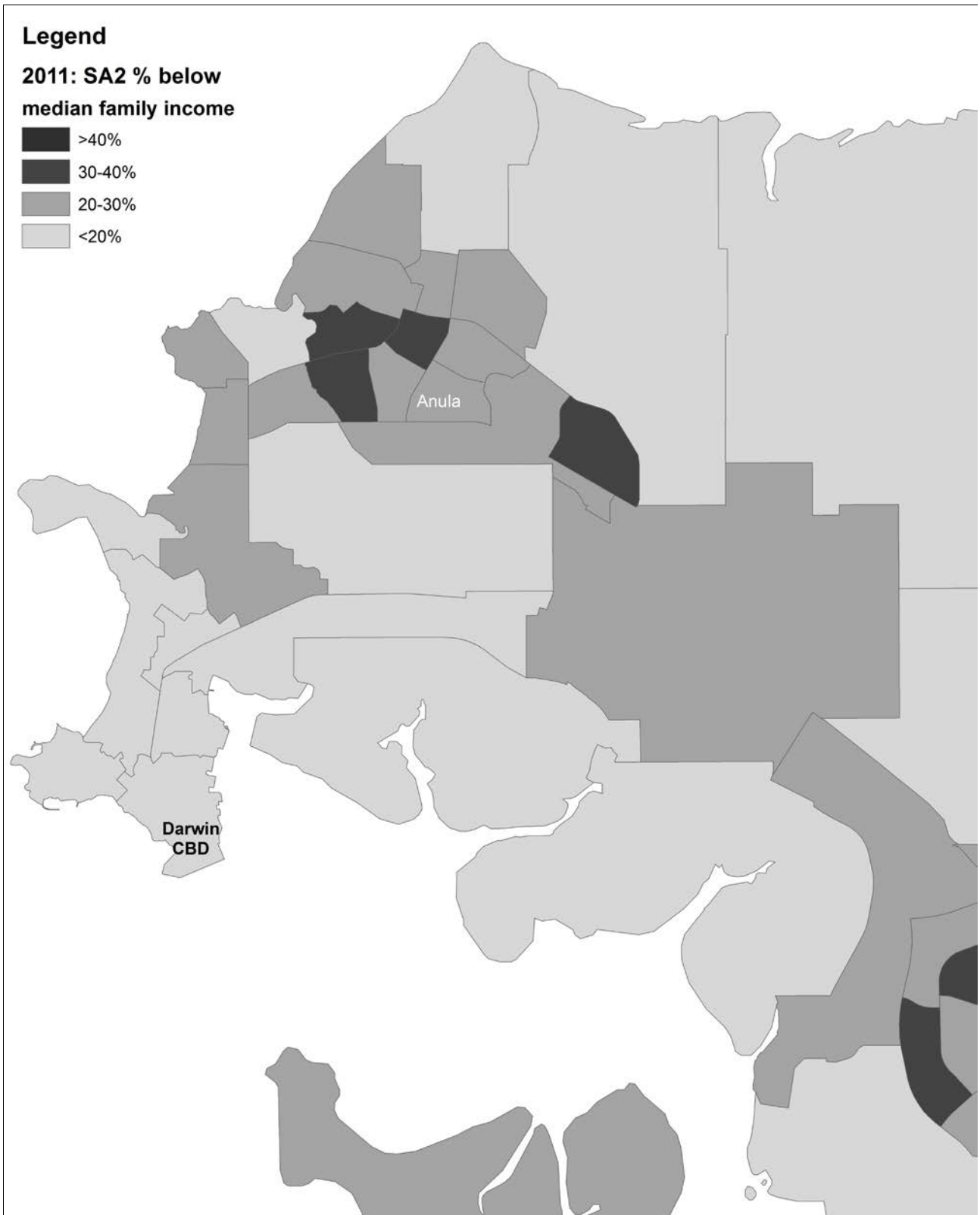
(b) Adelaide



(c) Hobart



(d) Darwin



Source: ABS (2012)



What do you do at home to reduce energy costs?

Never Stand Still

Built Environment

City Futures Research Centre

Do you live in one of these households?

1. Single-parent family [30 Mar, 10:30am]
2. Young singles (18-35) [30 Mar, 1pm]
3. Large family (5+ people) [1 Apr, 10:30am]
4. Older singles and couples (65+) [1 Apr, 1pm]

Do you earn less than \$1,500 per week before tax?

If so, we would love to hear from you! We are doing a research project on energy use in lower income households and invite you to join a 1-hour discussion on **Wednesday 30 March or Friday 1 April at The Salvation Army Raymond Terrace centre (15 Carmichael Street)** about:

1. how you currently save energy use at home
2. what your motivations are for saving energy
3. what programs have you joined to help save energy
4. how you would like to be assisted to save even more energy

The information that you tell us will be used to inform policymakers and service providers to design better programs to assist lower income households reduce their energy use across Australia.

We will give you a \$50 Coles gift voucher at the conclusion of the discussion to thank you for your participation, which you can use at Coles, Coles Express, Kmart, Target, OfficeWorks, Myer, and many other Coles group shops.

For more information, and to RSVP, please contact our project manager Dr Edgar Liu by:

1. email edgar.liu@unsw.edu.au, or
2. free call 1800 740 991.

This project is funded by the Cooperative Research Centre for Low Carbon Living. For more information about our project, search for "CRC RP3038" on Google.com.au.

Please complete this short survey on behalf of your household:



1. What is your Gender: Male Female
2. Which of the following age group do you belong to:
 18-24 25-34 35-44 45-54 55-64 65-74 75+
3. How many people usually live in your household? _____
4. What is your household's main income source?
 Salary / wage Age pension Superannuation Other government allowances
5. What is your household's approximate weekly income?
 Less than \$600 \$600-\$999 \$1,000-\$1,249 \$1,250 or more
6. What kind of accommodation do you live in?
 House (including cottages) Semi-detached (including terraces) Low-rise apartment (building less than 4 storeys)
 High-rise apartment Mobile home / caravan
7. Does your household currently:
 Rent public housing Rent community housing Rent privately
 Own our home outright Has a mortgage on our home
8. Please tick if you have any of the following in your home:
 Solar electricity panels Solar hot water system Heat pump hot water system
 Electric heater Gas heating Ceiling insulation
 Oil heating Fireplace (wood burning) Ceiling fans
 Electric cooktop/oven Gas cooktop/oven Whirly birds
 Low energy light bulbs Low energy whitegoods Skylight
9. What is your *main* transport mode?
 Car / motorcycle Public transport Bicycle Walk
 Other (please specify): _____
10. Which of the following types of carbon reduction support programs have you benefited from or participated in?
 Light bulb exchange Solar panel subsidy Energy consultation
 Fridge buy-back Assistance to pay gas/electric bills
 Other (please specify): _____

Thank you again for participating in our study.

Note: Q5 adjusted in each jurisdiction to reflect the two lowest income quintiles of their respective capital city.

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