Climate change: addressing the needs of low-income households in the private rental market

Background paper

Damian Sullivan
Brotherhood of St Laurence, December 2007

1 Introduction

Australian households face significant risks and vulnerability from the physical impacts of climate change and the impact of climate change mitigation measures such as a price on carbon. The high number of households in the private rental market in Australia, approximately 20 per cent of all households, creates a particular set of challenges for Australian policy makers seeking to respond to climate change. Lower-income renters in the private rental market are particularly vulnerable because a large proportion of them already face significant housing affordability stress. Climate change will place further pressure on these renters.

A considered policy response can ensure that lower-income renters are less vulnerable to the impacts of climate change. Any policy responses should be compatible with measures to reduce housing and utility stress for lower-income renters.

This short briefing paper will focus on energy efficiency measures for low-income households in the private rental market (referred to here as low-income private renters).

2 Climate change and households

Australian households will face significant risks from the altered climatic conditions. The country's geographic diversity makes it difficult to generalise the relevant impacts for housing. The main impacts of climate with implications for Australian buildings have been outlined by the Australian Greenhouse office (AGO 2007). They include (AGO 2007, p.3):

- increased energy consumption due to higher temperatures
- health effects of over-heating
- increased risk of damage from more intense tropical cyclones and storms and stronger winds; from increased cracking of drier soils, and from increased ground movement affecting foundations and pipe work
- increased damage from flooding
- increased bushfire risk

Low-income renters face particular barriers to reducing their vulnerability to such climate events. They include:

- living in lower quality (or sub-standard) housing
- living in housing without appropriate (and efficient) heating, cooling or insulation
- disincentives to either the landlord or renter to make structural improvements that would reduce their vulnerability
- inability to afford insurance and/or failure of the landlord to adequately insure the property.

Australian households and lower-income renters in particular will also be subject to increased costs as a result of climate change mitigation measures. The most significant is the likely introduction of a full carbon price regime in Australia, which will lead to increased costs of all goods and services.

The Brotherhood of St Laurence commissioned the National Institute of Economic and Industry Research (NIEIR) (2007) to investigate the impacts of a carbon price regime on low-income

households in Australia. The research showed that the impacts will be regressive (NIEIR 2007). A $25 per tonne carbon price would add 2.5 per cent to the average weekly household expenditure for a low-income household; and only 1.5 per cent of expenditure for a high-income household (NIEIR 2007). A $50 per tonne carbon price would add 3.2 per cent to the average weekly expenditure for a low-income household (NIEIR 2007). The Brotherhood recommends there should be policy measures to assist low-income households to cope with the impacts of these price increases.

Vulnerability and resilience

The extent of low-income households', or communities', vulnerability to the impacts of climate change depends on their exposure to the risks combined with their capacity to adapt to these risks (Gurran 2007). Their capacity to adapt is affected by a variety of factors including: 'income sources, age, health, tenure security, education, dependents, social networks, information, and access to services/resources' (Gurran 2007, p.4). Household and community resilience to climate change can be strengthened by decreasing the exposure to risks and increasing the capacity to adapt though measures such as increased security of tenure, social networks, access to information, services and other resources (Gurran 2007).

3 Low-income renters, climate change and other stressors

Australia has a high level of households in the private rental market – 28 per cent. Research by Randolph and Holloway (2007) suggests that of these households, 577,000 are low-income households; which is about 21 per cent of all low-income households.[1] Around two thirds of low-income renters in the private market are single person households; they are younger than the general population and are over-represented in low paying occupations (Randolph and Holloway 2007). In Sydney and Melbourne there is an over-representation of overseas-born residents (Randolph and Holloway 2007). Low-income renters live in a variety of accommodation types: they are over-represented in flats and multi household apartments, but also live in stand-alone houses and caravan parks.

To effectively address low-income private renters, specific attention will need to be given to Indigenous and cultural and linguistically diverse groups.

Climate change one of multiple stressors

Climate change is one of multiple stressors that low-income renters in the private rental market face. Housing stress and utility stress are particularly relevant to the focus here on energy efficiency.

Yates and Milligan (2007, p.37) identified low-income private renters as 'most at risk of facing the multiple problems that arise from a lack of affordable housing'. Their research shows that 65 per cent of renters are subject to housing stress and this figure will increase in the coming decades. The impacts of housing stress with particular relevance to climate change include:

- having insufficient money to cover rent or utility costs. This leads to stress in many aspects of life with related health and family problems (Yates and Milligan 2007, p.21).
- an increase in financial hardship and having to go without (Yates and Milligan 2007, p.21)

Low-income renters face additional stressors, which include the risk of being stigmatised with a poor credit history, being forced into frequent moves and having to make trade-offs regarding quality of dwelling and location (Yates and Milligan 2007, p.21).

Higher energy prices will have the greatest impact on households who already face difficulties paying their utility bills; that is they face 'utility stress'. A 1998-99 ABS study estimated 16.9 per cent of households faced utility stress; however the Committee for Melbourne (2004) noted that this figure is likely to be an underestimate. Australian households facing utility stress spend an average

[1] In the study, low-income households were defined as those with incomes below the bottom quintile of all working household incomes for each city. The household data was not equivalised.

of 8 per cent more on utilities than other households (9 per cent more in Victoria) (CfM 2004, p.60). Households living in rental accommodation are more likely to report utility stress and to suffer broader financial disadvantage than other households (CfM 2004, p.12). Around 28 per cent of household in private rental property suffer from utility stress (this is marginally lower than public housing, but significantly higher than private owners) (CfM 2007, pp.52–3).

Significantly, reduced housing or utility stress for lower income renters will improve their economic situation and therefore increase their adaptive capacity. A number of policy measures which have already been proposed to address housing stress for low-income renters have the potential to reduce their vulnerability to climate change. Relevant measures include enabling longer term, secure rental tenure and supporting low-income renters to purchase affordable housing.

4 Energy efficiencies and low-income renters

Household energy efficiency measures can include both behavioural change programs and technological changes which target energy efficiency. This section focuses on the technological changes. It is important to note however that they are unlikely to be effective without related behavioural changes (see AGO 2000). Further, some behavioural changes such as reduced energy consumption will alter the cost effectiveness of technological measures. Any programs which aim for technological efficiency should be developed in conjunction with behavioural change programs.

Household energy usage

The average emission profile for an Australian household is shown in Figure 1. The emission figures provide a useful guide to the likely exposure of households to increased costs related to climate change and indicate priority areas to target to reduce energy usage.

Average household emission data do not, however, reflect many significant factors including income and location which are directly related to transport expenses. For example, a two-car household in the outer suburbs of a capital city with limited access to public transport will have a much higher transport emissions profile than a single car household in the inner city.

Low-income households spend more of their average weekly income (NIEIR 2007) on utilities (electricity, gas and water) than do high income households. NIEIR's research shows that a poor household spends 6.8 per cent of their average weekly expenditure (excluding rent) on utilities, whereas a high-income tertiary-educated household spends only about three per cent of their weekly expenditure (excluding rent) on utilities.

5 Technological improvements

A significant amount of research has been undertaken on the most cost-effective residential home energy efficiency measures (see for example: SEAV 2004; SEAV 2003, McNicol 2004 and Wilkenfeld 2004).

Research conducted for the Sustainable Energy Authority of Victoria (2004) identified a series of cost effective home energy improvements; the research estimated savings across all Victorian households over a ten year period. The following activities all had simple pay back periods of less than 6.5 years (see Appendix 1 for more details) (SEAV 2004):

Building thermal performance and heating and cooling systems

- improve efficiency of or replace gas & solid fuel heaters (3.0 years)
- improve efficiency of ducted heating (3.3 years)
- weather stripping & sealing (5.2 years)
- increase all states to 5-star (new houses) (6.5 years)

Lighting Systems
- improve lighting efficiency (3.8 years)
- improve lighting control (4.2 years)

Cooking Systems
- Improved efficiency of cooktops and ovens (3.3 years)

Refrigeration Systems
- selecting more efficient replacement fridges (6.3 years)
- retrofitting/maintaining older fridges (1.2 years)

Dishwashers (excluding associated hot water)
- selecting more efficient replacement dishwashers (6.0 years)

Clothes Washers (excluding associated hot water)
- selecting more efficient replacement clothes washers (6.0 years)

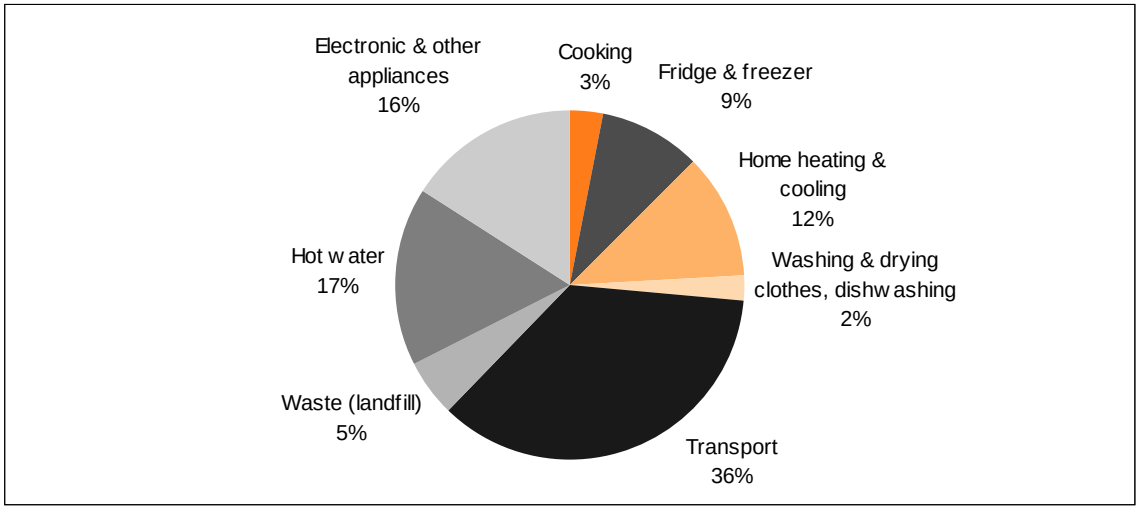
A number of other measures investigated had significantly longer payback periods (SEAV 2004; McNicol 2004):
- insulate existing houses – 18.8 years,
- improve efficiency of room air conditioners (RACs) – 23.9 years,
- replace electric heating with RACs – 12.7 years

A separate study identified possible savings from energy efficiency improvements in residential water heating (Wilkenfeld 2004). The majority of the energy savings would come from reduced hot water consumption rather than from more efficient water heaters (Wilkenfeld 2004, p.15). Measures were assessed for small, medium and large households. Those which had simple payback periods of less than 4 years included (Wilkenfeld 2004; McNicol 2004):

Water efficiency
- substitution of low flow shower roses (between 2005 and 2008)
- more efficient clothes washers (substitute highest efficiency models in new purchases):
  - top loading models (medium and large households)
  - front loading models (medium and large households)

Water system efficiency
- reduce heat loses from pipes
- more efficient gas water heaters (substitute highest efficiency models in new purchases):
  - substitute instantaneous for gas storage (only in small households, not in medium or large households)
  - substitute highest efficiency models for gas storage models (all households); but not instantaneous models (most households)
- more efficient electric water heaters
  - substitute a more highly insulated unit (small and medium households)

Figure 5.1 : Emission profile for an Australian Household



Source: State Government of Victoria 2007

A number of measures did not achieve a simple payback in four or six years.

- substitution of all front loaders for top loaders (new purchases)
- substitution of electric heat pumps for electric storage water heating

A large proportion of the savings are related to measures which are fixed (or not easily transportable).

The studies focused on energy and did not consider any non-energy or ancillary benefits that may result from the measures.

In conversation with the Brotherhood of St Laurence, Graham Armstrong simplified the discussion and identified a number of priority efficiency measures that would reduce the impact of a full carbon price regime on low-income renters (see Table 1) (Brotherhood of St Laurence 2007).

Armstrong prioritised measures based on the largest energy and cost savings combined with the lowest implementation cost.

6 Energy efficiency programs targeting lower-income households

In Australia numerous programs target energy efficiency measures in private households. There are fewer programs which specifically target energy efficiency in low-income households. Internationally, more programs have been developed which focus on low-income households such programs are based on recognition of the benefits to individuals, society and utility companies (see Appendix 1 for a summary of the benefits identified from international programs).

There is widespread recognition of barriers to low-income households accessing energy efficiency programs. These barriers include:

- *split incentives:* the benefits are shared between landlord, renter and society, which reduces the incentive for any one party to act
- *security of tenure:* the lack of long-term and secure tenure means that renters cannot be sure that they will gain the full benefits
- *high up-front costs*: the high up-front costs of many measures relative to the long time frame to get a return on the investment, combined with the low-income of the renters

- *fixed or non transportable assets:* it is difficult (or impossible) to take many of the efficiency measures to a new home should the renter relocate

Even in programs that specifically target low-income households there are barriers to participation and numerous studies have pointed to the importance of effective promotion and outreach (see for example AGO 2000, DTEI 2006)

Program funding

Australian and international programs are funded from a variety of sources including government, utility companies (which is often linked to their statutory obligations), or other private sources. Government funded programs include the *Victorian Energy and Water Taskforce*; US federally funded *Weatherization program*; and the UK *Warm Front* program. Utility-funded programs include the UK *Energy Efficiency Commitment* and US state-based utility programs funded from compulsory levies (York and Kushler 2005). An increasing number of programs are either partially or fully funded from the generation of carbon credits. These include the *Victorian Energy Efficiency Target* scheme and Energy Australia's *Residential Energy Efficiency Refit Program* (Refit Program) in NSW. See Appendix 2 for more details on specific programs.

Table 6.1: Energy efficient measures for low-income households

	Issue	Ranked priorities
Insulation	About 20 per cent of households in Australia are not insulated, in addition much insulation is not well installed	Use an accredited installer to: 1. Effectively seal households 2. Effectively insulate ceilings
Hot water systems	Hot water systems account for approximately 25 per cent of an average Victorian household's energy use. Electric hot water systems, which are the most expensive to run, are installed in 80 per cent of low-income households in Victoria.	1. Install instantaneous gas hot water 2. Install gas storage 3. Install solar/gas hot water (due to higher cost) Numerous grants are available.
Appliances	Appliances very quickly pay back initial additional costs in energy savings	1. Only use appliances above 4 stars 2. Use CRT or LCD television
Water	Water heating is a significant component of household energy usage	1. Install low-flow shower heads 2. Install dual-flush toilets

Source: Brotherhood of St Laurence 2007

Financial incentives for energy efficiency measures in low-income households

Loans, rebates, and grants have all been used to finance lower-income household energy efficiency measures, with varying degrees of success. The following section outlines these options. The Australian Greenhouse Office (2000) notes that financial incentives are not necessarily effective or efficient motivators and should be used in conjunction with other measures to maximise their effectiveness (AGO 2000)

Loans

Low-interest or no-interest loans have been used in a number of programs. Loans could be applied to either transportable appliances such as refrigerators, or structural changes such as insulation.

Previous program experience suggests that low-interest loans targeted at **low-income private renters** are unsuitable for a large section of the low-income market. The Australian Greenhouse Office's (2000) review of factors motivating home energy action found that 'loan schemes are often ineffective and are difficult to market, as they can be confusing' (AGO 2000). Rebates or grants were generally preferred (AGO 2000). Similarly, the evaluation of South Australia's *Energy Efficiency Program for Low-income Households* found the 'Low Interest Loans Scheme' to be 'cumbersome and expensive to administer' (DTEI 2004, p.44). The evaluation recommended that 'consideration should be given to replacing IFLS (interest free loan scheme) with a grant for low-income earners to reduce administration costs' (DTEI 2004, p.44). Limited security of tenure raises

particular problems for any renter considering a low-interest loan to pay for energy efficiency measures that are fixed to the dwelling or not easily removable or transportable. Low-interest loans are therefore likely to be more effective if targeted at appliances.

Low interest loans for owners/landlords may be more successful than loans for lower income renters. Such loans would enable the landlord to make capital improvements to the property. It is likely that the landlord would seek to recoup the initial investment through increased rent (see issues below).

Rebates or grants

Rebates and grants are a popular means to induce a shift to energy efficient households, but rebates are often expensive and difficult to implement (AGO 2000). Not surprisingly, rebates or grants which cover 100 per cent of expenditure attract higher rates of participation (AGO 2000). Rebates and grants can be provided through retailers or directly through government.

There are a wide variety of rebates available through state and federal governments. They include:

- solar hot water: federal government up to $1000; and state programs up to $1500
- low flow shower heads: free exchange or discounted
- insulation rebates (Victoria): 50 per cent off insulation up to $500 for concession card holders
- hot water systems (Victoria): $700 for concession card holders who buy a 5-star instantaneous or storage hot water heater (also available for landlords)

Rebates will provide some incentive for **low-income households**. It is likely they will be more effective for transportable appliances rather than fixed (or non transportable) structural changes.

Rebates reduce the disincentive for **owners/landlords** to implement energy efficiency changes. A rebate scheme connected to regulatory obligations is likely to be more effective than a simple rebate scheme.

Tax rebates

Tax rebates targeting low-income households are unlikely to be effective because their taxable income (by definition) will be relatively low.

Tax rebates targeting owners of rental properties are likely to be more effective. However the size of the tax rebate, combined with the level of complexity of the measure, is likely to affect the level of participation.

Comprehensive installation programs – grant

Several overseas programs provide comprehensive installation programs free of charge to lower-income households. These programs generally apply to renters or owners and some predate popular concern with climate change. They include many relevant features. The programs include:

- government-funded programs which combine audits with the implementation of free energy efficiency measures. Significant examples include the US federally funded *Weatherization Program*; and the UK government's *Warm Front* program which targets fuel poverty.

  In Victoria, the state government funded *Victorian Energy and Water Taskforce* provides this comprehensive service. The program targets energy poverty in low-income households. In 2006–07 the taskforce predicts that it will run seven projects retrofitting 1269 homes (SV 2006). Since commencing in 2003, the project has retrofitted over 4500 households (SV 2006).
- programs which are fully or partially funded by utility companies. Significant examples include the UK's *Energy Efficiency Commitment* which assumes a 100 per cent subsidy for households in the priority group (households on income or disability support) (DEFRA 2006); and a range of state-based programs in the US (York and Kushler 2005).

International and Australian experience suggests that these fully funded comprehensive programs may be particularly valuable for customers who face difficulties paying their utility bills (see Sefton

2004, Schweitzer & Tonn 2002). The evaluation of the *Energy Efficiency Program for Low-income Households* argued that the program would have benefited from a higher level of support for households experiencing difficulties paying their bills or at risk of disconnection (DTEI 2006).

Carbon Credits

Credits for emission reductions are already being factored into programs in Australia and overseas. Carbon credits will provide a means to support community based welfare organisations or energy companies to fund energy efficiency measures (see for example NSW GGAS 2003).

Other measures

Energy star ratings for rental properties

One proposal put forward (see, for example, AGO 2000) is energy star ratings for rental properties. Under such a scheme properties would be evaluated and given a star rating. Part of the rationale for this proposal is to provide an incentive for landlords to invest in energy efficiency improvements. The energy star ratings system would provide a means of comparison for renters. The landlord would also be in a position to increase rent to reflect the higher energy star rating (See rent increases below). The Nationwide House Energy Rating Scheme (NatHERS) may provide a basis for such a program (see Appendix 2).

7 Selected issues

Priorities and targeting: social and environmental benefits

Overseas experience suggests that programs must be carefully targeted to achieve social goals as well as greenhouse gas emission cuts (see Sefton 2004). Table 2 provides some examples of program priorities and how they might affect target groups. International programs have different eligibility criteria (commonly a percentage of the poverty line, and/or access to government benefits). Sefton's (2004) evaluation of the *Warm Front* program, for example, proposed a number of changes to the eligibility criteria in order to increase the program's impact on households experiencing actual fuel poverty rather than achieving energy savings in households which are not in fuel poverty.

Is there a need to separate low-income renters from low-income owners/buyers?

While there may be a need to design measures which specifically target low-income private renters many overseas programs for low-income households are available to both people living in rental properties or low-income home owners/buyers (examples include the *Weatherization program*, *Warm Front* and the *Energy Efficiency Commitment).*

Improvements may lead to increases in rents

Capital improvements in rental properties may lead to landlords increasing the rent of properties. The argument for increasing the rent would be particularly strong if the landlord pays for any improvements as the landlord will not recoup the savings through the efficiency measures. Rents could also be increased in houses where energy efficiency measures have been instigated through a grants program or at the instigation of tenants. More detailed investigation of the options needs to occur, this may include:

- research into any measures incorporated into overseas programs, for example the Weatherization program or Warm Front. It should be noted that private renters in some countries may be concentrated in housing with rent controls.
- investigating ways to incorporate rent requirements into any program obligations for owners and rights for tenants.
- working with tenancy tribunals to develop a means to exclude such capital improvements from a justification for rent increases.

Without adequate safeguards in place some unscrupulous owners may also access incentives for low-income private renters then sell the house and/or evict the tenants.

Have other measures been instituted in rental properties?

Given the widespread availability of small rebates for water-saving devices such as tanks and low flow shower heads, it would be useful to examine the extent to which they have been installed in rental properties

Table 7.1: Program priorities, targets and likely benefits

Primary goal	Target group	Priority
Reduce greenhouse gas emissions	All income earners households	High energy users Highly inefficient homes
Reduce vulnerability to utility stress and service disconnection	Households suffering or at risk from utility stress	Households with severe utility stress Highly inefficient homes High energy use
Reduce exposure to the impacts of price rises associated with climate change mitigation measures	Low-income households	Households with high energy expenditure Highly inefficient households

Appendix 1: Summary of Victorian residential energy savings from efficiency improvements

EEI Measure	Energy Savings (PJ pa)	Energy Savings (%)	Energy Savings ($M)	Total Cost ($M)	Payback (Yrs)
Building shell + heating & cooling	37.7	16.4%	$458.8	$2,175	5.0
Refrigeration	3.5	10.9%	$126.4	$439	3.5
Cooking Systems	3.9	17.7%	$100.4	$330	3.3
Dishwasher	0.3	8.0%	$10.5	$63	6.0
Clothes washer	0.2	13.5%	$8.5	$35	4.1
Water heating (including water efficiency and water heating system efficiency)	21.2	14.9%	$427.3	$1,038	3.1
Total (all measures < 6.5 years)	**69.5**	**13.0%**	**$1,229.5**	**$4,464**	**3.6**

Source: adapted from McNicol 2004, Wilkenfeld 2004

Appendix 2: Examples of Australian and international programs

Household energy audits and retrofits

Victorian Energy and Water Taskforce (See page 5)

Energy Efficiency Program for Low-income Households – South Australia (see DTEI 2006)

The *Energy Efficiency Program for Low-income Households* ran from December 2003 until December 2006. The aim of the program was 'to reduce financial hardship faced by low-income households as a result of rising energy costs' and the objectives included reducing greenhouse gas emissions (DTEI 2006, p.3). The program involved the provision of free home energy auditing and a basic (minimal) retrofit service. This was complemented by two sub-schemes – one to buy back inefficient fridges and another to offer interest free loans to fund the purchase and installation of energy saving products.

Weatherization Program – United States

The *Weatherization Program* is a long running federally funded program designed to decrease the energy burden on low-income households by improving household energy efficiency. It services over 100,000 homes per year. Eligible households are audited by professionally trained weatherization crews who determine the most cost effective measures appropriate for each home. The relevant measures are then implemented free of charge. The average expenditure is $2826 USD. Detailed evaluations have suggested that every one dollar of federal funding returns approximately $2.60 in energy and non energy benefits.

Warm Front – England

The *Warm Front* program targets households suffering from fuel poverty. Households receive a comprehensive audit and retrofit. In 2004–05 the program will service 140,000 households; and it is projected that between 2000 and 2006 the program will service 1.3 million households. Similar programs run in Scotland, Wales and Northern Ireland. The budget for the program will be expanded from GBP 190 million in 2005–06 to GBP 380 million in 2007–08.

Energy Efficiency Commitment (EEC) –United Kingdom

The *Energy Efficiency Commitment* is a statutory obligation on utility companies to reduce householders' emissions. The program began in 2002; however its predecessor began in 1992. The budget is estimated to be GBP 150 million per annum for 2005–08. The program involves subsidised installation of insulation, efficient appliances and lighting. 50 per cent of savings must come from the priority group (which includes households eligible for a range of welfare benefits, including low-income elderly and disabled people, and low-income families). Grants for the priority group are around 90 per cent of the installation cost (grants for standard households are around 66 per cent).

Other incentives schemes

Victorian Energy Efficiency Target (VEET) Scheme

The Victorian Energy Efficiency Target (VEET) scheme is an incentives scheme targeted at all Victorian households (DPI undated). The scheme will begin operation in 2009, with a target of reducing household green house gas emissions by 2.7 million tonnes (Mt) per annum. It is estimated the average household will save $44 on their annual energy bill as a result of the scheme. The basic operation of the scheme as outlined by the Department of Primary Industries (undated) is summarized below.

The Government sets targets for energy retailers to reduce household energy consumption. In order to reach these targets energy retailers must surrender approved energy certificates. Energy certificates are generated when an approved provider implements eligible energy efficiency activities in households. Approved providers are likely to include energy retailers, appliance retailers, small businesses including tradespeople and community organisations. Energy certificates can be generated by a range of household energy efficiency measures, for example providing or subsidizing energy efficient light bulbs, insulation or appliances. The project does not specifically target low-income earners. However the Victorian government is expected to develop complementary measures including rebates for energy efficiency improvements and winter energy concession program (Krbaleski 2007).

Utility Funded Programs – United States

The US has an extensive program of utility funded energy efficiency programs for low-income households. A review of exemplary programs by York and Kushler (2005, p.7) found that there is 'no one "exemplary" program model. Successful programs can be structured under a variety of legislative or regulatory frameworks'. In addition to the standard benefits from low-income energy efficiency programs, York and Kushler (2005) identified several additional benefits for utility companies such as: 'lower credit and collection costs, avoided service shut-off costs, reduced uncollectible account write-offs, and improved customer relations'

'Fridge Buy Back' – NSW (from Sheppard and Tate 2007)

This is a private sector initiative driven by the NSW Government's Energy Savings Fund and Greenhouse Gas Abatement Scheme (GGAS), and supported by 20 Councils in metro Sydney. Program participants can have second refrigerators removed and safely disposed of, with metals being recycled and refrigerant gases, which are potent GHGs, safely destroyed. Participants receive a $35 rebate and on average save $160 per year in energy costs.

Other schemes

Phoenix fridges

Phoenix Fridges takes fridges donated from all across Melbourne and recycles, repairs, and retrofits them to make them more energy efficient. It then resells fridges at affordable prices to low-income households. The project provides training and employment for people who are unemployed. The Phoenix Fridge Project is a partnership run by Brotherhood of St Laurence and Moreland Energy Foundation. The project is supported by TRUenergy, the Adult Multicultural Educations Service and the Sustainability Fund (Victorian Government).

Affordable water and energy efficiency program – NSW (from Sheppard and Tate 2007)

This two year program is jointly run by the NSW Council of Social Services and the NSW Dept of Energy, Utilities and Sustainability. It aims to improve the energy and water efficiency of low-income households, and of the providers of support and crisis accommodation. Its focus is to improve the information flow and identify how to increase the use of energy and water efficient devices, appliances and practices by these target users.

Home Energy Efficiency Trial (HEET) – NSW (from Sheppard and Tate 2007)

This program is run by Country Energy and AMPY Email Metering. It involves trialling 'smart metering' technology that allows participants to better manage energy use and costs. The project involved 150 residential customers, who were provided with a home energy monitor, showing the cost and level of household energy consumption at any moment, as well as daily, weekly and monthly usage patterns. The trial showed that residential energy customers will adjust their energy usage if they are provided with cost and consumption information.

Nationwide House Energy Rating Scheme (NatHERS) – Australia

National standards for household energy ratings based on computer modelling. The scheme provides standards for professionals offering auditing and for the software they use (see NatHERS 2007)

Appendix 3: Benefits from energy efficiency programs targeted at low-income households

Numerous studies have outlined the benefits of energy efficiency measures targeted at low-income households (see, for example, TEA 2006, York and Kushler 2005, Schweitzer and Tonn 2002). The actual benefits to each household will depend on multiple factors including the amount each household spends on energy as a proportion of average weekly earnings; the primary fuel source; local climatic conditions and the energy efficiency of dwellings. For example, in the US, low-income earners spend an average of 16 per cent of their gross annual income on energy costs; this is significantly more than average expenditure of low-income earners in Australia. The benefits identified internationally do, however, provide a pointer to the types of benefits we can expect in Australian programs. The benefits listed are from TEA (2006), Schweitzer and Tonn (2002) and York and Kushler (2005).

Low-income household benefits

- lower energy bills, which results in:
  - reduced chance of utility stress and subsequent homelessness
  - more comfortable homes as households are able to more effectively heat and cool their homes
  - increased ability to cope with more intense climatic conditions such as heatwaves
  - housing being more affordable
- reduced risk of accidents from supplementary heating
- Environmental benefits
- reduced pollution and greenhouse gas emissions

Community / economic benefits

- job creation
- delivery capacity developed to meet low-income earners' needs is available to the rest of the sector
- reduced costs to shelters and social security agencies
- seniors are able to stay in the homes longer
- keeps money in the community (Money not being spent on energy can be spent elsewhere with economic benefits
- reduced health care costs from the health benefits of warmer homes in winter and cooler homes in summer

Utility Companies benefits

- lower credit and collection costs
- avoided service shut offs
- reduced uncollectible account write-offs
- improved customer relations

8 References

Australian Greenhouse Office (AGO) 2000, *Motivating home energy action – a handbook of what works*, prepared by Michelle Shipworth for the Australian Greenhouse Office, viewed 3 December 2007, <http://www.greenhouse.gov.au/local/motivating/index.html>

Australian Greenhouse Office (AGO) 2007, *An assessment of the need to adapt buildings for the unavoidable consequences of climate change*, Final Report to the Australian Greenhouse Office, Department of the Environment and Water Resources by BRANZ Limited, viewed 10 December 2007, <http://www.greenhouse.gov.au/impacts/publications/pubs/buildings-report.pdf>

Brotherhood of St Laurence forthcoming, *Energy efficiencies to assist low-income households adjust to a rise in the price of non-renewable energy and reduce greenhouse gas (GHG) emissions*, Conversation with Graham Arnold, Saturn Corporate Resources Pty. Ltd., Brotherhood of St Laurence

Committee for Melbourne (CfM) 2004, *Utility Debt Spiral Project*, Committee for Melbourne, viewed 3 December 2007, <http://www.cuac.org.au/docs/Committee%20for%20Melb%20Utility%20Debt%20Spiral%20Report%20Nov04.pdf>

Department of Environment, Food and Rural Affairs (DEFRA) 2006, *Synthesis of climate change policy evaluations*, Department of Environment, Food and Rural Affairs, United Kingdom, viewed 3 December 2007, <http://www.defra.gov.uk/environment/climatechange/uk/ukccp/pdf/synthesisccpolicy-evaluations.pdf>

Department of Primary Industries (DPI) 2007, *Victorian Energy Efficiency Target (VEET) scheme fact sheet*, Department of Primary Industries, Victorian Government, viewed 3 December 2007,<http://www.dpi.vic.gov.au/dpi/dpinenergy.nsf/93a98744f6ec41bd4a256c8e00013aa9/8269dc63c5665fb5ca25738500158110/$FILE/VEET%20scheme%20fact%20sheet_Oct%202007.pdf>

Energy Division, Department for Transport, Energy and Infrastructure (DTEI) 2006, *Evaluation of energy efficiency program for low-income households*, Energy Division, Department for Transport, Energy and Infrastructure, South Australian Government report prepared by Spoehr, J, Davidson, K, and Wilson, L, Australian Institute for Social Research, viewed 3 December 2007, <http://www.dtei.sa.gov.au/__data/assets/pdf_file/0020/16832/eeplih_eval_report.pdf>

Gurran, N 2007, *Climate change and environmental planning: where do we build houses?*, Presentation to the Shelter NSW Climate change and low-income housing conference, viewed 3 December 2007, <http://www.shelternsw.infoxchange.net.au/docs/sem0711climatechange-gurran.zip>

Krbaleski, J 2007, *Victorian Energy Efficiency Target Scheme* Powerpoint presentation, Director, Energy Investment and Sustainability, viewed 3 December 2007, <http://www.dpi.vic.gov.au/dpi/dpinenergy.nsf/93a98744f6ec41bd4a256c8e00013aa9/8269dc63c5665fb5ca25738500158110/$FILE/VEET%20forum%20presentation%2031%20oct%2007.pdf>

McNicol, I 2004, *Residential sector energy efficiency improvement potential*, Sustainable Energy Authority, viewed 3 December 2007, <http://www.nfee.gov.au/public/download.jsp?id=207>

National Institute of Economic and Industry Research (NIEIR) 2007, *The impact of carbon prices on Victorian and Australian households*, A report for the Brotherhood of St Laurence, viewed 3 December 2007, <http://www.bsl.org.au/pdfs/NIEIR_Impact_of_carbon_prices_on_Vic&Aust_households_final_May2007.pdf>

NatHERS – Nationwide House Energy Rating Scheme (NatHERS) 2007, *NatHERS – Nationwide House Energy Rating Scheme website*, viewed 3 December 2007, < http://www.nathers.gov.au/index.html>

NSW Greenhouse Gas Abatement Scheme (NSWGGAS) 2003, *Case study accreditation of the EnergyAustralia residential energy efficiency refit program* NSW Greenhouse Gas Abatement Scheme, viewed 3 December 2007, <http://www.greenhousegas.nsw.gov.au/documents/CS-DSA-EA.pdf>

Randolph, B and Holloway, D 2007, 'Where do low-income private renters live?' *AHURI Research and Policy Bulletin*, Issue 88, viewed 3 December 2007, <http://www.ahuri.edu.au/publications/download/rap_issue_88>

Schweitzer, M, 2005, *Estimating the national effects of the U.S. Department of Energy's Weatherization Assistance Program with state-level data: a metaevaluation using studies from 1993 to 2005*, ORNL/CON-493, Oak Ridge National Laboratory, Oak Ridge, Tennessee, viewed 3 December 2007, <http://weatherization.ornl.gov/pdf/CON-493FINAL10-10-05.pdf>

Schweitzer, M and Tonn, B 2002, *Non Energy Benefits from the Weatherization Assistance Program: A Summary of Findings from the Recent Literature*, ORNL/CON-484, Oak Ridge National Laboratory, Oak Ridge, Tennessee, viewed 3 December 2007, <http://weatherization.ornl.gov/download_files/Con-484-april02.pdf>

Sefton, T 2004, *Aiming high – an evaluation of the potential contribution of Warm Front towards meeting the Government's fuel poverty target in England*, viewed 3 December 2007, <http://www.eaga.com/downloads/pdf/Sefton_EagaPCT_FinalReport.pdf>

Sherrard, J and Tate, A 2007, 'Equity in response to climate change roundtable An Australian snapshot' in Brotherhood of St Laurence 2007 *Equity in Response to Climate Change Roundtable*, viewed 3 December, <http://www.bsl.org.au/pdfs/Equity_in_Response_to_Climate_Change_Roundtable_report_2007.pdf >

State Government of Victoria, 2007, *What you can do at home* Victorian Government's greenhouse web site, viewed 3 December 2007, <http://www.greenhouse.vic.gov.au/greenhouse/wcmn302.nsf/LinkView/2B608D774CDCF50DCA2570B40011701F20DE1E5C634C3EB7CA25702D001B6D4C>

Sustainable Energy Authority Victoria (SEAV) 2004a, *Energy efficiency improvement in the residential sector*, prepared by EMET Consultants for the Sustainable Energy Authority Victoria, viewed 3 December 2007, <http://www.nfee.gov.au/public/download.jsp?id=192>

Sustainable Energy Authority Victoria (SEAV) 2003, *National Framework for Energy Efficiency – Preliminary assessment of demand-side energy efficiency improvement potential and costs*, prepared by Armstrong, G for the Sustainable Energy Authority Victoria, viewed 3 December 2007, <http://www.nfee.gov.au/public/download.jsp?id=185>

Sustainability Victoria (SV) 2006, *Annual Report 2006–2007*, Sustainability Victoria, viewed 3 December 2007, <http://www.sustainability.vic.gov.au/resources/documents/SV_2006_07_AR_Book_One.pdf>

Toronto Environmental Alliance (TEA) 2006, *A low-income energy efficiency program: mapping the sector and program design principles*, A report prepared by the Toronto Environmental Alliance for the Ontario Power Authority's Conservation Bureau, viewed 3 December 2007, <http://www.conservationbureau.on.ca/Storage/13/1834_Low_Income_Energy_Efficiency_Program.pdf>

Yates, M and Milligan, V 2007, *Housing affordability: a 21st century problem*, AHURI Final Report No. 105, viewed 3 December 2007, <http://www.ahuri.edu.au/publications/download/nrv3_final_report>

York, D and Kushler, M 2005, *Meeting essential needs: the results of a national search for exemplary utility-funded low-income energy efficiency program*, Report Number u053, American Council for an Energy-Efficient Economy, viewed 3 December 2007, <http://www.aceee.org/getfile.cfm?publicationid=5>

Wilkenfeld, G & Associates, 2004 *NFEE – Energy efficiency improvement potential case studies, residential water heating* Report to the Sustainable Energy Authority Victoria by George Wilkenfeld & Associates, viewed 3 December 2007, <http://www.nfee.gov.au/public/download.jsp?id=191>