



# **A COMPREHENSIVE RESIDENTIAL ENERGY AND WATER EFFICIENCY RETROFIT PROGRAM FOR THE ACT**

A UNIONSACT DISCUSSION PAPER

**UNIONSACT**

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# Foreword



Climate change is core union business. There are no jobs on a dead planet.

The impact of climate change, and public policies to mitigate and adapt to global warming represents the largest structural economic change in Australia's history. The Federal Government's savage cuts to public services and local jobs in Canberra, combined with rhetoric of innovation and agility highlights the central importance of having a progressive, pro-worker government in the ACT.

A major challenge facing the ACT Government is how to stimulate growth in the private sector, while directing sufficient funding to

provide high quality public services. The government's approach to sustainability and job creation is integral to facing this challenge.

It is widely recognised that technology and innovation are central to working peoples' aspirations for a prosperous, healthy, low-carbon economy. New technologies are essential to meeting carbon targets at an affordable cost; innovation is the key to a vibrant economy. Shifts of this magnitude have occurred in the past, and were characterised by significant and chaotic upheaval, the brunt of which was borne by working people, their families and communities. Indeed, many people are still paying the price for the rapid economic changes of the last few decades.

It is clear that the Government has an important – even central – role to support low carbon and environmental innovation, correct market failures and provide adequate protections and safeguards for the disadvantaged and people on low incomes.

But underpinning this must be a commitment to engaging, consulting and working with workers, something that to date, despite the positive sustainability and climate policies of the ACT Government, has been lacking. There is a transition taking place in Canberra, but it is not yet a just transition.

The climate transition must not have the same negative features and impacts for working people of past economic restructures. This would not only be morally wrong and socially damaging, but it will undermine the credibility of the transition.

Numerous international and domestic forums and agencies, including the International Labour Organisation emphasise the importance of a just transition when responding and adapting to global warming. The ILO states:

*In order to promote sustainable development that is socially just, environmentally friendly, and economically efficient, emphasis must be placed on governance and management changes to better service decent lives of millions of people. ... A just transition is primarily about good governance. It is about applying the right policies in consultation and with the involvement of those concerned. ...*

*Governments have to involve trade unions in addressing the needs of industries and communities at large in order to ensure that the transition to a carbon friendly future is just and fair to all – that development is sustainable. (IJLR, 2010, Vol2.2)*

As the pace of industrial, social and economic change hastens, it is more important than ever to involve working people in discussions about the future of their jobs, their industries and their communities.

The necessary decarbonisation of Canberra's economy is not something that should just 'happen' to workers. Working people and their communities must be involved deeply in the decisions that affect them, and although there are no coal mines or coal-fired power stations in the ACT, the ACT Government's climate policies have substantial impacts across almost every sector and industry.

Working people not only face the impact of climate change in their workplaces, but also in their homes. Overwhelmingly, it is working people and people on low incomes that feel the effects of the heatwaves and extreme cold. They also pay significantly more for heating and cooling than those on higher incomes, and many people face the prospect of energy poverty.

To have a just transition in Canberra, the ACT Government must not only ensure that working people and the community are more deeply engaged in decision-making, but



there must be meaningful investment in social justice outcomes and job creation. As new sectors and industries grow, there is a central role for the ACT Government to ensure that this does not occur at the expense of decent work, with secure and decent employment conditions. Similarly, there is a strong need for increasing support for workers through training, so that the transition happens quickly, efficiently and fully tapping the potential of the existing workforce.

## UNIONSACT DISCUSSION PAPER

UnionsACT advocates for big, important permanent policy changes to benefit working people and their communities.

This document is a **UnionsACT Discussion Paper**. As a discussion paper, it designed to provoke debate, develop new ideas and influence long-term policy thinking amongst the Government, the community and unions.

This is not a statement of UnionsACT policy, but is instead designed to inform and stimulate debate and discussion on a pressing issue facing policy-makers. While this document contains recommendations, they are provided to demonstrate how the ideas in the document could practically be implemented.

This discussion paper looks at the ACT Government's existing Energy Efficiency Improvement Scheme. Energy efficiency is often called the 'fifth fuel', and is the

cheapest, cleanest and largest source of new energy available to our economy.

Savings in energy and water use is worth potentially tens of millions of dollars, to individuals and to the government. Saving a kilowatt hour of energy can cost as little as one-sixth of a cent, compared to the 10+ cents it would cost to generate using fossil fuels or renewables. The payback of energy efficiency improvements is typically measured in months, not years.

Yet the benefits for the economy, for jobs, for communities, for the government, and for the climate are only realised when energy efficiency measures are implemented at scale – that is, across entire communities or cities.

The existing efficiency scheme in the ACT is well-meaning, but lacks ambition.

This discussion paper proposes a substantial scaling up of the EEIS. As the paper explains, this would have three key benefits:

Firstly, a much larger EEIS would create jobs. UnionsACT estimates as many as 760 new jobs (net) would be created over ten years.

Secondly, household bills would be cut by as much as \$1,360 per year, which for many people means avoiding energy poverty.

Finally, Canberra's carbon emissions would be more rapidly decreased. Households account for 40 percent of the ACT's carbon emissions,

so improved energy efficiency is essential for the ACT to meet its zero carbon targets by 2025.

Flowing from these three principal benefits are others. Reduced water use would make Canberra more resilient to drought. Retrofitted houses would improve health and community wellbeing. Lower bills and more comfortable homes would improve social equity. Almost \$700 million of investment would be unlocked across the ACT economy through stronger, larger efficiency standards.

## THE RECOMMENDATIONS

The recommendations of this discussion paper are:

1. **Set clear goals:** The ACT Government should set mandatory efficiency standards for Canberra's housing stock.
2. **Improve standards:** Mandatory disclosure when houses are sold and leased would enable homeowners and renters to make informed choices. Higher and enforced standards for new homes is also essential.
3. **Facilitate innovative financial solutions:** The government is a key financier for public housing, but must facilitate private investment by homeowners, developers and landlords.
4. **Targeted support for vulnerable groups:** Disadvantaged households require specific supports to address

low literacy, language barriers and low incomes, and additional funding for front-line community and social service agencies will be required.

5. **Increase skills and training:** a skilled workforce is required to retrofit Canberra's homes and other buildings. Government investment in skills training, apprenticeships and workplace safety training is critical.

Working people cannot wait. The transition is occurring now, and while much is happening, the clearest evidence from climate scientists is that more must be done, and quicker, to avoid the worst impacts of global warming.

Yet change must be just; it must enhance, not worsen social justice. And for working people, the change must create new, better, more secure jobs.

If you have any feedback or views about this discussion paper, please contact UnionsACT.



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# Introduction



**There are three principal reasons that UnionsACT is proposing this discussion paper for a comprehensive home retrofit program.**

1. **Long-term job creation:** The proposed retrofit program will create as many as 840 jobs over 10 years, 760 (net) of which will be ongoing. Importantly, these jobs will be embedded in a range of skilled and semi-skilled professions, including the electrical and plumbing trades, which will also stimulate demand for apprenticeships and training.
2. **Enhancing social justice:** The majority of people living in low-quality
3. **Reducing carbon emissions and water use:** Canberra's households are amongst the most energy and water intensive in Australia, and despite the nation-leading carbon reduction and renewable energy targets, the ACT Government could make considerable sustainability and climate improvements by reducing energy and water

consumption through a comprehensive retrofit program.

Improving residential energy and water efficiency delivers a 'win-win-win' outcome for people, the economy, and the environment.

Saving energy and water cuts the cost of living, particularly for the growing number of households struggling to pay soaring utility bills. Efficient homes are more comfortable and healthier to live in, particularly in extreme weather. Investing in efficiency creates thousands of jobs and postpones or avoids the need for costly additional supply. And reducing consumption cuts greenhouse pollution and saves water for our rivers.

However, Australia's historically abundant and cheap energy supply has meant that efficient resource use has been a low priority for households and governments. Recent rapid energy price rises have started to change that, with many Australian households moving to improve the performance of their homes in recent years. However, the majority of Australian households are still missing out on the health and financial benefits of efficient homes because they lack the incentive, information or financial resources to act, and/or because they rent.

This proposal outlines the case for government action to substantially improve the energy and water efficiency of residential building stock in the Australian Capital Territory. Implementing a comprehensive

household retrofit program for the ACT would unlock \$630 million in investment over 10 years, supporting up to 840 jobs (gross) during the life of the program and up to 760 ongoing jobs. ACT householders could save up to \$1,360 on their annual energy bills, while targeted assistance for low-income and disadvantaged households would ensure all householders benefited.



# The case for raising the efficiency performance of ACT homes

## CREATING JOBS

The ACT has been hit hard by recent job cuts, losing 7,200 federal jobs and 300 territory employees – a total of 7 percent of its public sector workforce – in the last year.

The public sector is the ACT's largest employer (accounting for more than 30 percent of the workforce), and consequently such deep cuts have a significant impact on the entire ACT community.<sup>1</sup>

Furthermore, ACT's employment rate, while low by national standards, masks significant entrenched disadvantage.<sup>2</sup> The ACT has a highly educated and mobile workforce, meaning that those workers who relocate interstate to find work do not show up in ACT jobless figures. At the same time, those who are unemployed in the ACT tend to be relatively less skilled and disadvantaged.

Jobs in the energy efficiency sector tend to be in small to medium sized businesses and the community sector. The sector also supports a range of low to semi-skilled jobs in trades, services and manufacturing.<sup>3</sup>

Consequently, delivery of a comprehensive

residential efficiency retrofit program could not only support thousands of jobs, particularly for low-skilled and disadvantaged workers, but also help to diversify the ACT's economy.

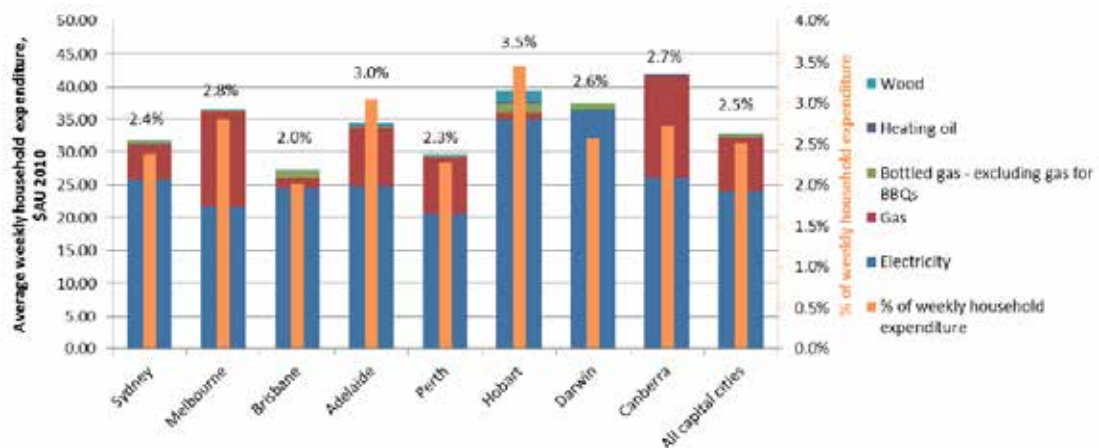
This study estimates that a comprehensive household efficiency retrofit program could support up to 840 jobs (gross) during the ten-year life of the program, and up to 760 ongoing jobs (net).<sup>4</sup>

These figures are for 'gross' jobs created, a measure which does not make a distinction between jobs drawn from elsewhere in the economy and jobs which are additional to business as usual. However, as the energy efficiency sector is relatively more jobs-intensive than the economy-wide average, and supports jobs across a range of skill levels, it can be assumed that investment in an efficiency program would create new opportunities which draw unemployed workers into the workforce.

## CUTTING HOUSEHOLD BILLS

ACT households are among the biggest users

**Figure 1. Average weekly household expenditure by State and Territory<sup>7</sup>**



of energy on a per capita basis in Australia, using around 25 GJ per person per year, with more than half (58%) used for winter heating.<sup>5</sup>

While retail electricity prices are relatively low by national standards, high consumption means that household costs are significant. In the five years between 2008 and 2013, ACT electricity prices rose by 40 percent.<sup>6</sup>

The annual energy bill of an average 3-person household in the ACT is estimated at between \$2,000<sup>8</sup> and \$3,400 per year.<sup>9</sup> A retrofitted home can cut its annual energy use by 40 to 50 percent at a cost of approximately \$6,000 translating into savings of \$800 to \$1,360 per year (see section below).

## CUTTING GREENHOUSE EMISSIONS AND TRANSITIONING TO RENEWABLE ENERGY

The stationary energy sector (electricity and gas) is by far the largest contributor to ACT’s greenhouse emissions, accounting for 68 percent of total emissions.<sup>10</sup> The residential sector accounts for 40 percent of electricity demand.<sup>11</sup> As the ACT’s electricity supply

is still predominantly dependent on non-renewable sources, there is a strong correlation between cutting consumption through efficiency and greenhouse gas abatement.<sup>12</sup>

Improving efficiency and cutting electricity demand is also critical to efforts to increase the proportion of renewable energy within the ACT’s electricity supply, and hence lower the emissions intensity of supply over time. The ACT government has recently announced a commitment to a 100% renewable energy target by 2025. An ongoing focus on energy efficiency will help to ensure that target is achieved faster and at lower cost than would otherwise be the case.<sup>13</sup>

A recent study concluded that “If, through energy efficiency measures or by other means, demand is low enough, the level of renewable generation assumed in this analysis will be sufficient to meet the entire electricity requirements of the ACT in 2019-20, so there will be no requirement for additional non-renewable electricity and the emissions intensity of electricity consumed will be zero.<sup>14</sup>

## SAVING WATER FOR OUR RIVERS

Unlike most regions across Australia and the Murray-Darling Basin, the vast majority (59 percent) of water consumed in the ACT is used within urban areas.<sup>15</sup> The average ACT household consumed 79,000 litres per person in 2012-13, or 216 litres per person per day, making Territorians the third highest water-users in the country.<sup>16</sup> While consumption has fallen since 2003 due to restrictions put in place in response to the Millennium drought and 2003 bushfires, the ACT recorded an 8 percent increase between 2011-12 and 2012-13. This suggests that ongoing water conservation success will depend on a continued focus on efficiency.

However, while consumptive use of water accounts for only about 6 percent of the ACT's total water resources and supply is considered secure until 2030, prolonged drought could put pressure on both supplies and high value aquatic ecosystems. Furthermore, the ACT's reliance on water resources within the Murray-Darling Basin, which is already under considerable stress, means that water conservation and efficiency will continue to be important, particularly in a climate-affected future where droughts are predicted to be more frequent and more severe.<sup>17</sup>

## IMPROVING COMMUNITY HEALTH AND WELLBEING

An effective climate change response

requires action to both mitigate its impacts (through emissions reductions) and to adapt to predicted changes, particularly the likelihood of more frequent and severe extreme weather events such as droughts and heatwaves.

For example, the heat-wave in southeast Australia in late January 2009 has been estimated to have caused 374 excess deaths,<sup>18</sup> while a recent international study concluded that more people die from the effects of chronic cold in Australia than in Sweden.<sup>19</sup>

A significant contributor to weather-related adverse health impacts, which disproportionately affect low-income and disadvantaged households, is the poor quality of our housing.<sup>20</sup>

Improving the quality of our residential housing stock and ensuring our homes continue to provide safe and healthy shelter in extreme conditions is therefore a key part of an effective climate change adaptation response.

## ENHANCING SOCIAL EQUITY

The adverse impacts of our poor quality housing are not spread evenly across our community. Low-income and disadvantaged households are more likely to live in poor quality homes, rely on cheaper, inefficient (and hence costly to run) appliances and spend a greater proportion of their disposable income on energy.<sup>21</sup> They are more likely

**Table 1. Average Australian household expenditure on energy, 2009-10<sup>23</sup>**

2009-10	EQUIVALISED DISPOSABLE HOUSEHOLD INCOME QUINTILE						
	Lowest	Second	Third	Fourth	Highest	All	Second & third deciles
% of total households	24.5	18.2	18.1	18.6	20.6	100	21.3
Mean weekly income	\$314	\$524	\$721	\$975	\$1704	\$848	\$429
% of av. weekly expenditure on domestic fuel and power	3.9	3.2	2.8	2.4	2.0	2.6	3.7
% of av. weekly domestic fuel and power expenditure on electricity	76.3	75.0	74.6	75.7	74.3	75.1	n.a.
% of equivalised disposable income on domestic fuel and power	7.0	5.3	4.3	3.7	2.6	3.8	6.5
% of equivalised disposable income on electricity	5.4	4.0	3.2	2.8	1.9	2.9	n.a.

to live in more heat-vulnerable areas and to suffer from chronic health conditions which not only contribute to higher energy usage but can be exacerbated by unhealthy living conditions.<sup>22</sup>

As a consequence, many low-income households are either struggling to pay ever-increasing energy bills as prices continue to rise, or are engaging in a variety of rationing behaviours or cutting expenditure on other essentials such as food.<sup>24</sup> The average cost of household energy for low-income households in the ACT is approximately double that of other homes – 6.7 percent compared with 2.5 to 3 percent.<sup>25</sup>

While many Australian households are responding to recent price rises by investing in home efficiency upgrades, efficient appliances and renewable energy, low-income households – those who need the cost-savings the most – are missing out because the up-front costs of improvements are unaffordable and/or because they rent. Renters face a split incentive whereby the landlord is responsible for the quality and efficiency of the building and major energy-using fixed appliances (such as water and space heating),

while the tenant is responsible for paying recurrent utility bills.

The combined impact of poor quality housing and recent price rises can be seen in the growth of the ACT government concessions budget, which has increased 9 percent a year over the past five years to nearly \$50 million in 2013-14. A significant proportion of this assistance – \$12 million – goes to discounts on energy and gas bills for 28,500 ACT concession card-holding households.<sup>26</sup>

However, there are many households beyond concession card-holders who are suffering or at risk of fuel poverty (inability to pay bills or engaging in rationing). These include participants in retailer hardship programs (often large families with large mortgages and high energy usage), and households on low but irregular income.<sup>27</sup>

A comprehensive residential retrofit program, which effectively addressed the variety of barriers preventing low-income and disadvantaged households from improving the efficiency of their homes, would make a significant contribution to social equity outcomes.

# How could the efficiency of Canberra's homes be improved?

**The ACT's housing stock, predominantly located within Canberra, is made up of a relatively homogeneous stock of detached housing in suburban neighbourhoods.**

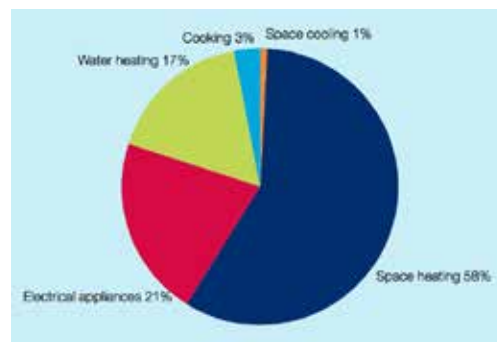
Before minimum energy performance standards were introduced, homes in the ACT were typically built to a standard lower than 2 stars. A study encompassing 5,000 ACT homes built prior to 1995 found that the average energy efficiency rating was just below 1.7 stars.<sup>28</sup>

Household energy and water use is influenced by three main factors:

- thermal efficiency of the building shell;
- efficiency of appliances (water and space heating, shower-heads, toilets); and
- occupant behavior.

Typical issues affecting energy usage found in

**Figure 2. Average energy use of a Canberra household<sup>29</sup>**



older Canberra homes include no or inadequate insulation (around 20 percent of ACT homes have no insulation); leaky windows and doors; large areas of low performance (single glazed) windows; un-insulated timber floors; inefficient or ineffective heating; and inefficient (halogen) lights.<sup>30</sup>

As winter heating accounts for more than half of the energy used in the average ACT household, improving insulation provides significant and cost-effective opportunities for raising performance, as outlined in Table 2 below.

A recent analysis of a comprehensive range of retrofit options conducted by Sustainability



**Table 2. Cost-effectiveness of energy saving measure<sup>31</sup>**

Benefit	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	AUS
Ceiling Insulation	Yes(7)	Yes(7)	Yes(7)	Yes(7)	Yes(7)	Yes(7)	Yes(7)	Yes(7)	Yes(7)
Top up to Ceiling	Yes(3)	Yes(7)	No	Yes(7)	No	Yes(7)	No	Yes(7)	Yes(5)
Wall Insulation	Yes(3*)	Yes(7)	No	Yes(7*)	No	Yes(7)	Yes(3+*)	Yes(7)	Yes(7*)
Floor Insulation	No	Yes(5)	No	No	No	Yes(3+)	No	Yes(5)	No
Duct (Gas)	Yes(5)	Yes(7)	No	Yes(5)	Yes(3)	Yes(7)	No	Yes(7)	Yes(5)
Duct (Rev. Cycle)	Yes(5)	Yes(7)	Yes(7)	Yes(7)	Yes(5)	Yes(7)	Yes(7)	Yes(5)	Yes(5)
Duct (Cooling)	No	No	Yes(5)	No	No	No	Yes(7)	No	No

**Legend**

<b>Yes(7)</b>	Indicates the measure is cost effective with a 7% discount rate and current energy pricing trends
<b>Yes(5)</b>	Indicates the measure is cost effective with a less than 7% discount rate (discount rate indicated in brackets)
<b>Yes(3+)</b>	Indicates the measure is cost effective only at 3% discount rate and assuming a higher trend in energy prices
<b>No</b>	Indicates the measure is not cost effective under any of the economic scenarios examined in this study

Victoria,<sup>1</sup> concluded that a 3.7 star increase can be achieved at a cost of around \$2,000 per star via building shell upgrades alone (excluding double-glazing and window-shading) (see Table 3.)<sup>32</sup>

The study also concluded that lighting and appliance upgrades are more cost-effective overall than building shell upgrades. Hence, incorporating these measures (such as low-flow shower rose, efficient lighting, water and space heating) into a comprehensive retrofit would deliver further cost-effective savings and act to lower overall retrofit payback times. An efficient, retrofitted household was found to save around 40 percent of an average household's energy costs, which

.....  
 1 Victoria (Melbourne) is taken to have a comparable climate to Canberra, with the majority of energy usage relating to winter space heating.

Measure	Star increase	Av. energy saving (MJ/Yr)			Av. cost (\$)	Av. saving (\$/Yr)	Payback (Yrs)
		Gas	Elec.	Total			
Draught sealing	0.69	7,942	225	8,167	\$1,037	\$157	6.6
Ceiling insulation (easy)	0.84	8,210	277	8,487	\$1,130	\$165	6.8
Ceiling insulation (difficult)	1.14	4,891	204	5,095	\$1,119	\$102	11.0
Wall insulation	1.02	5,561	136	5,697	\$4,167	\$108	38.6
Drapes & pelmets	0.58	2,209	54	2,263	\$2,036	\$43	47.5
Double glazing <sup>9</sup>	0.63	2,278	66	2,344	\$12,145	\$45	269.9

Note: Upgrade measures modelled, applied in a specific order and costed at commercial rates. Changing the order could affect the outcomes.

**Table 3. Average costs and savings for building shell upgrades<sup>33</sup>**

corresponds to between \$800 and \$1,360 a year for an average ACT household.

Furthermore, with the cost of renewable energy declining rapidly in recent years, it is becoming feasible in many cases to incorporate roof-top solar into comprehensive retrofits to improve cost-effectiveness and lower payback times still further.

And finally, it is important to note the relationship between efficiency and conservation, and the role that behavior change plays in cutting waste. For example, installing an efficient shower rose will only lead to lower consumption if shower times are kept to a minimum.

Consequently, efficiency improvements will be maximised through an integrated approach which combines education and behavior change with improvements to building shell and appliance performance.

# ACT energy and energy efficiency policy framework

**Reducing energy use in the residential sector has been identified by the ACT Government as a key strategy for achieving its greenhouse emission reduction targets.**

As outlined in the 2012 climate change strategy Action Plan (AP2),<sup>34</sup> a number of policies and programs are in place or under development which focus on reducing residential sector energy use and cutting emissions.

## ENERGY EFFICIENCY IMPROVEMENT SCHEME

- The EEIS, which commenced in January 2013, sets a Territory-wide energy savings target correlating

to obligations by Tier 1 electricity retailers<sup>2</sup> to undertake eligible energy-saving activities in ACT homes. Retailers are also obliged to achieve a proportion of their energy-saving obligations in low-income households.

- To 2014, approximately 50,000 energy-saving activities have been undertaken in nearly 25,000 homes across the ACT. To date only four activities have been implemented: door-seals, lighting, stand-by power controllers and fridge removal. Around 30 percent of all participating households have been priority (low-income or concession card holding) households. A priority household target of 20% will apply from 2015 until 2020.

2 Tier 1 retailers are defined as having electricity sales of 500,000 MWh per year and more than 5,000 ACT customers. ActewAGL is the major Tier 1 retailer in the ACT. Tier 2 retailers (all other retailers) may choose to undertake energy-saving activities or pay a contribution fee.

- The 2014 review of the EEIS concluded that the net present value of energy cost savings to be \$1,614 per participating household or \$318 in annual savings. Average cost to each household was estimated to be around \$18 for 2013 and \$33 in 2014.
- The ACT government announced in August 2015 that the EEIS will be extended to December 2020. The government has also committed to improving harmonization with schemes in other jurisdictions and to expanding the range of eligible activities in the future.

## PROVISION OF ENERGY EFFICIENCY INFORMATION TO TENANTS

- Landlords in the ACT are currently required to disclose any existing energy efficiency rating at the point of lease.
- During 2013 and 2014 stakeholder consultation and a regulatory impact assessment have been completed as part of an investigation of the feasibility of making disclosure mandatory, ie. requiring landlords to provide information to tenants on the energy efficiency of buildings and major fixed appliances.
- A recommended course of action will be considered during the 2015-16 budget process.

## ZERO EMISSIONS BUILDINGS

- New buildings in the ACT are required to meet a minimum 6-star energy performance standard under the Nationwide House Energy Rating System.
- The ACT Government has committed to develop a Pathway to Zero Emissions Buildings Policy covering residential and non-residential building types.
- This is currently being progressed as part of the development of the ACT Climate Change Adaptation Strategy and Building Act Review, with consultation due to commence in 2015.

## COMMUNITY ENGAGEMENT STRATEGY ON CLIMATE CHANGE

- A community engagement strategy to engage the community on climate change matters and to provide integrated information, advice and support on reducing energy bills and cutting emissions, was released in July 2014 for implementation to 2017

## ACTSMART PROGRAMS

ACTSmart is a one-stop-shop for providing advice and assistance to the community on saving energy and water, cutting waste and reducing emissions. Key programs relating to

residential sector advice include:

- ACTSmart Home Energy Advice: commenced in April 2014, it provides information, advice and resources via telephone, online queries and workshops to all ACT residential households to minimise their home energy use. A home energy efficiency assessment is also available at a cost of \$250-\$350 per home (free for pensioner concession card holders under the Outreach program).
- ActSmart online sustainability portal: provides fact sheets, tips and tools to assist homeowners reduce energy use.
- Low income energy and water efficiency program (Outreach) assists low-income households in the ACT to improve the energy and water efficiency of their homes. It is implemented through community welfare organisations and provides low-income households with energy efficient essential home appliances, energy efficiency home assessments, retrofits and repairs, as well as general information and advice. A tender process for a replacement program “Home Energy Assessments for Low-Income Households” has recently been completed in mid-2015.

Government established a 90% renewable energy target by 2020. More recently in August 2015, the government announced its intention to offset 100% of power consumption with renewable energy by 2025.<sup>35</sup>

- Currently on track to achieve 60 per cent renewable energy target by the year 2017 and 80 per cent by the year 2018.
- Ongoing efficiency gains will enable the 100% renewable energy target to be achieved sooner and at less cost.<sup>36</sup>

## **RENEWABLE ENERGY TARGET**

- In November 2013 the ACT



## Opportunities for strengthening ACT energy efficiency approach

**While the ACT Government has clearly identified energy efficiency as an important priority and has put a range of programs in place, there are nevertheless a number of opportunities for achieving better outcomes, including job creation, that are being missed.**

The Energy Efficiency Improvement Scheme (EEIS), the ACT's primary vehicle for driving the installation of efficiency measures in homes, has been responsible for the delivery of around 50,000 measures in 25,000 homes to date. While this represents around 13 percent of ACT's housing stock,<sup>37</sup> the installed measures – door seals, lighting, appliance replacement and standby power controllers (SPCs) – fall well short of a comprehensive efficiency upgrade, particularly given that only an average of 2 activities have been undertaken in each participating household.<sup>38</sup> Furthermore, there are some doubts as to the ongoing efficiency benefits of SPCs, as more than a third of households removed the

device post-installation.<sup>39</sup>

As outlined above, the measures which are most likely to deliver cost-effective efficiency improvements (cost-savings and improved comfort) for Canberra homes are higher value measures such as insulation and draught-sealing. However, the current policy framework is not effectively driving the uptake of these measures.<sup>3</sup>

A recent analysis of the remaining scope for cost-effective insulation retrofits across Australia following the close of the Federal government's Home Insulation Program concluded that significant opportunities remained in the ACT.<sup>40</sup>

From Table 4, assuming that 'ceiling insulation' and 'top-up ceiling insulation' are mutually exclusive categories, there are a

3 .....  
Draught-sealing is confined to lower edge door seals, not comprehensive sealing around doors, windows etc

**Table 4. Potential scope for cost-effective retrofit of energy-saving measures (000's of households)<sup>41</sup>**

Benefit	NSW	VIC	QLD	SA	WA	TAS	NT	ACT	AUS
Ceiling Insulation	529	98	399	64	125	24	23	13	1,275
Top up to Ceiling	729	922		338		93		65	2,146
Wall Insulation	1,640	1,195		400		124	47	58	3,464
Floor Insulation		601				70		27	698
Duct (Gas)	27	288		6	8	0		12	342
Duct (Rev. Cycle)	45	10	6	16	6	1	<1	2	86
Duct (Cooling)			8				2		10

Note: Greyed fields indicate that as this measure was found to be not cost effective under present circumstances, no potential for retrofit has been assumed.

minimum of 78,000 homes in the ACT (or around 60 percent of total housing stock) that could benefit from the installation or improvement of ceiling insulation. One could reasonably assume that these houses that lack a basic measure such as insulation, would also benefit from other retrofit measures such as draught-sealing as part of an integrated retrofit package.

Retrofits are most cost-effective when delivered as an integrated 'whole-of-house' package incorporating an audit to ascertain the most appropriate mix of measures to complement whatever is already in place, as well as education and behavior change advice for occupants. Installing a suite of retrofit measures via a single visit to the house also improves the labour productivity of installation.

As the market for low-cost or free activities (as have been promoted by EEIS to date) becomes saturated within the ACT, it will become more important to ensure that barriers to the installation of higher value measures are overcome, if ongoing efficiency

improvements are to be achieved.<sup>42</sup>

The key barriers to the more widespread uptake of higher value measures and comprehensive, whole-of-house retrofits include:

## LACK OF TIMELY, SPECIFIC AND TRUSTED INFORMATION

Homeowners are generally unaware of how their homes perform, the benefits of efficiency and the options for improvement. Information services alone are generally insufficient to effect change if they rely on relatively time poor and unmotivated householders to actively seek out advice and translate generic information to their own specific situation.

## UP-FRONT COST HURDLES

Despite well-designed efficiency upgrades commonly paying for themselves within ten years, many householders will discount the value of future savings relative to immediate, up-front costs. Hence efficiency investments

remain a low priority for many households. For low-income households and households experiencing energy hardship, the upfront costs of upgrades are simply unaffordable even if they would deliver cost-savings into the future.

## **SPLIT INCENTIVE FACING LANDLORDS AND TENANTS**

Landlords and tenants in the private rental market face a 'split incentive', whereby the landlord who has the power and agency to invest in improving the building, lacks the incentive to do so because the tenant is responsible for paying recurrent utility bills.

# A comprehensive residential efficiency program for ACT

**Fully realising the job creation, cost-of-living, environmental, health and social equity benefits of efficient housing stock, will require a more proactive and integrated policy approach in the ACT that effectively addresses the market barriers identified earlier.**

The proposed program aims to achieve a step change improvement in the performance of ACT's entire housing stock, to ensure all householders including low-income and disadvantaged households, can access the benefits of homes which are cheaper to run and more comfortable to live in.

Achieving a widespread improvement in ACT homes at least cost to government, requires government to focus on creating the right policy environment to leverage investment from range of sources (retailers, home-owners, landlords), while targeting government resources towards the most vulnerable.

## SET A CLEAR GOAL

The ACT Government has set specific greenhouse emissions reduction and renewable energy targets, and has articulated the important role that increased energy efficiency needs to play in achieving these targets. However, a specific objective for upgrading the energy efficiency of ACT homes against which progress could be measured is currently lacking.

In the lead-up to the 2010 Victorian election, there was bipartisan commitment to upgrading Victoria's housing stock to meet an average 5-star and 100 litre per person per day standard by 2020. However, with two subsequent changes of government, little progress towards this goal has been made and both parties have now backed away from this 2010 commitment.

There is an opportunity for the ACT Government to take the lead by committing to transform Canberra into a 'smart city' of water and energy efficient homes that are

affordable and comfortable to live in, and to generate significant numbers of jobs in the process.

Setting and achieving an equivalent goal – of ACT’s housing stock meeting an average 5-star equivalent and 100 litre per person per day standard by 2025 – would require an estimated 75 percent of Canberra’s 142,000 dwellings<sup>43</sup> to be upgraded by an average of 3 stars.<sup>44</sup>

This would stimulate investment of nearly \$700 million, supporting up to an estimated 840 jobs (gross) during the ten-year implementation phase life the program and up to 760 (net) ongoing jobs.<sup>45</sup>

Achieving this goal will require action in the following areas to overcome the barriers to efficiency. These recommendations are consistent with those currently being promoted to the Victorian Government by the One Million Homes Alliance of consumer, social sector and environmental organisations.<sup>46</sup>

## IMPROVE STANDARDS

### IMPROVING MANDATORY DISCLOSURE AT THE POINT OF SALE

The ACT has already demonstrated leadership in the area of building performance standards by being the first (and currently only) Australian jurisdiction to require energy performance disclosure for residential

buildings. Since 1999, all sellers of homes in the ACT have had a mandatory obligation to obtain an energy efficiency rating (EER) and publish it in any advertisements relating to the sale of that property.

While there is evidence that mandatory disclosure is having the intended effect of delivering a price premium for higher quality homes and hence providing homeowners with a market incentive to upgrade their homes,<sup>47</sup> there are nevertheless opportunities for improvement in the way information is communicated to potential homebuyers:

- Typically the rating tools used to produce EERs focus on the thermal performance of the building shell and do not take account of other major energy-using features such as fixed appliances (hot water systems, space heating and cooling etc). Consequently, EERs do not typically reliably predict the total energy performance of a house.
- Secondly, it is not always readily apparent to potential homebuyers how EER ratings translate into tangible benefits such as running costs (or savings) for a given house. There can be confusion about what is being communicated by the star rating system and what that is likely to imply for household energy bills. The more easily homebuyers can assess the ongoing benefits of buying a more efficient home, the more highly they will value efficiency and



the stronger the market incentive for vendors to invest in upgrades will be.

## MINIMUM STANDARDS AT THE POINT OF LEASE

The ACT Government is currently considering extending mandatory disclosure to all rental properties, and has undertaken a stakeholder consultation process during 2013 and 2014. Approximately 30 percent or around 40,000 of occupied dwellings in the ACT are rented.

Under current laws, any existing energy efficiency rating is required to be disclosed at the point of lease in any advertisement to rent a dwelling. However, regulations also provide for a “reasonable excuse” for not listing the rating, and this combined with poor enforcement, has led to a situation where the majority of properties advertised for rent do not list an EER rating.<sup>48</sup>

The ACT Government’s recent stakeholder consultation process has concluded that the economic case for extending the mandatory energy efficiency disclosure requirement to all ACT rental properties was strong.<sup>49</sup> However, several key stakeholders argue there is a strong case for going beyond disclosure to mandate compliance with minimum efficiency performance standards at the point of lease.<sup>50</sup>

Disclosure relies on the concept of information being used to exercise market power. However, in a tight rental market such as

Canberra, the majority of renters regardless of income have little market power and few opportunities to discriminate between properties of differing quality.<sup>51</sup>

Low-income renters are particularly vulnerable. They are more likely to rent than the rest of the population, more likely to live in low quality dwellings and to spend a greater proportion of their disposable income on utilities. A recent study found that up to 70 percent of low-income households in Canberra (63 percent in the lowest income quintile and 70 percent in the second lowest income quintile) were paying severely unaffordable rent.<sup>52</sup> In the current environment, often the only accommodation the most disadvantaged can afford to rent is of very poor quality.

The key barrier hindering investment in upgrading rental properties is the split incentive facing landlords and tenants: tenants are responsible for paying utility bills whereas landlords have the power to make efficiency improvements.

The low rates of participation by landlords in recent schemes such as the Federal Home Insulation Program, even when participation came at zero cost, is evidence that landlords currently have little incentive to voluntarily invest in efficiency improvements.<sup>53</sup>

Furthermore, tenants are typically hesitant to contact their property manager or landlord to request improvements or even to take advantage of government-funded retrofit

schemes as they do not want to be viewed as a ‘troublemaker’ and risk a potential rent increase or eviction.

However, recent focus group research has found that landlords are prepared to invest in upgrading their properties if information is clear and from an independent source, costs are minimal, and administration is not onerous.<sup>54</sup>

With property values and rental yields in Canberra continuing to rise<sup>55</sup> and thousands of negatively-g geared investors enjoying significant tax concessions, it is time to shift the balance back in favour of tenants who are currently shouldering most of the cost burden of our poor quality housing stock.

Effectively addressing the split incentive requires the introduction of minimum standards at the point of lease, combined with the establishment of complementary financing mechanisms to enable landlords meet the new standards.

The minimum standard should initially be set at a relatively low and achievable level to capture the worst-performing properties. This minimum standard should be ratcheted up through elimination of the lowest rating category over time, to drive improvements across the entire rental stock and ensure all renters benefit.

## IMPROVED STANDARDS AND COMPLIANCE REGIMES FOR NEW HOMES

As the ACT’s housing stock continues to grow, it is important that performance standards for new homes continue to improve, to keep pace with rising energy costs and ensure the stock of under-performing homes is not increasing.

The ACT Government’s commitment to develop a Pathway to Zero Emissions Buildings Policy covering residential and non-residential building types is therefore welcome. This initiative provides an opportunity to move away from prescriptive measures-based rating systems towards a ‘whole of home energy and water management’ approach.

It will also be important to give attention to compliance regimes to ensure new buildings comply with standards and actually perform in practice as expected.

## FACILITATE INTEGRATED FINANCE AND INFORMATION TO DRIVE EFFICIENCY UPGRADES

Achieving a meaningful improvement in the performance of ACT’s residential housing stock at least cost to government, will require investment by a range of actors including householders, landlords, utility retailers and government.

However, although efficiency upgrades save money and can pay for themselves in less than 10 years (particularly when combined with rooftop solar), the upfront costs and lack of access to affordable finance discourages many homeowners from taking action.

While improving standards will create an incentive for investment, there is an important role for government in facilitating accessible and affordable finance to enable homeowners and landlords to meet standards. With interest rates, and particularly government bond rates at an all-time low, there has never been a better time for government to invest in infrastructure.

The ACT Government's recent announcement of an extension of the Energy Efficiency Improvement Scheme to 2020 is a welcome step and represents an important source of funding for efficiency upgrades. However, the scheme's current emphasis on the relatively piecemeal installation of low-impact measures such as SPCs and door seals will not be sufficient to drive the comprehensive upgrade required. The ACT Government should explore opportunities for reforming the EEIS to drive more comprehensive, whole-of-house retrofits, such as through the adoption of project-based methodologies, as are currently under consideration by the Victorian government for introduction to the Victorian Energy Efficiency Target scheme.

In addition, the ACT Government should explore opportunities for adopting innovative

low-cost financing models such as Environmental Upgrade Agreements (EUAs) for funding integrated efficiency and renewable energy upgrades. An EUA is a tripartite contract between a building owner, finance provider and local government. Under an EUA, a lender provides finance to a building owner and the local council collects repayments through the rates system. The council then passes the property charge onto the lender. As the loans are repaid through the local council rates charge, they are considered low-risk by the financier.

EUAs are currently available for non-strata commercial and light industrial buildings in several local government areas in NSW, while the Victorian government has recently enabled all Victorian councils to offer EUAs for commercial buildings. There is an opportunity to explore how such tri-partite arrangements might be effectively implemented within the ACT system of government, where the ACT Government rather than local council is responsible for municipal rates collection.

With advances in technology and the expansion of the energy efficiency services sector, as well as the plethora of information provided by different sources including government, retailers and business, many households experience confusion about how to access reliable information and assistance. There is a role for government in ensuring that any Territory-wide, retrofit financing scheme is effectively integrated with good quality information services, to ensure that

homeowners have access to reliable, independent advice about the most cost-effective mix of measures for their home.

As well as ensuring homeowners and landlords have access to affordable finance to fund upgrades, proactive steps should be taken to protect tenants from unreasonable rent increases and evictions. This could include providing means-tested grants or loans to enable low-income landlords to meet minimum standards.

## **TARGETED RETROFIT AND BEHAVIOR CHANGE PROGRAMS FOR VULNERABLE GROUPS**

Improving standards, providing affordable finance and reliable advice should address the barriers hindering most households from investing in efficiency improvements.

However, disadvantaged households face additional barriers to engaging with efficiency programs, and need targeted interventions from government to ensure participation.

These households include public and community housing tenants, concession card-holders, the elderly, retailer hardship program participants (often larger families with large mortgages and high energy use), energy-rationing households, Aboriginal Australians, culturally and linguistically diverse communities, and people living with disabilities.

Disadvantaged households typically face information barriers such as low literacy levels and language barriers, they often lack internet access and/or cannot afford to spend long periods of time waiting to access phone advice services, and they can find information provided by a plethora of different sources conflicting, complex or confusing. Furthermore, even though low-income households have a lot to gain, improving energy efficiency is not always of highest priority for households facing multiple economic and social challenges.<sup>56</sup>

Effective participation by these groups in energy efficiency programs relies on proactive targeting and recruitment through existing trusted relationships with established local social sector service providers, which have the experience and relationships necessary for successful on-ground delivery.

A recent analysis of the ACTSmart Outreach Energy and Water Efficiency program for low-income households showed that participating households had achieved a 22 percent reduction in winter energy use and a \$270 saving on their household winter energy bill.<sup>57</sup> Key stakeholder groups such as ACTCOSS have called for the Outreach program to be expanded and extended.<sup>58</sup> The government has recently completed a tender process for a replacement program – “Home Energy Assessments for Low-Income Households”. It will be important to ensure ongoing programs effectively integrate assessments, advice and behaviour change with funding for

meaningful home upgrades to address the underlying causes of high usage.

The recent growth in the ACT energy and water concessions budget also suggests there is a growing problem with ACT customers struggling to pay their bills. Furthermore, many households who are prime candidates for retailer hardship programs are not necessarily aware of services.<sup>59</sup>

While providing assistance for customers in temporary hardship is an appropriate role for energy and water retailers, addressing the growing problem of chronic unaffordability by addressing the underlying cause of high usage, should be considered a shared responsibility with government.

Government should explore opportunities for partnering with ACT's energy and water utilities retailers to co-finance comprehensive

energy and water efficiency retrofit and behavior change programs for customers experiencing financial hardship.

As a major landlord itself, the ACT Government also needs to demonstrate leadership by investing in upgrading the ACT's 11,500 public and community housing dwellings.<sup>60</sup> The ACT government should implement a comprehensive energy and water efficiency retrofit and upgrade program including an audit for each dwelling, delivered through a significant funding boost to existing asset management and maintenance programs.

## SKILLS AND TRAINING

As outlined in Appendix 1, a comprehensive home retrofit program for the ACT should stimulate \$630 million in investment, supporting up to 840 (gross) jobs over ten years and up to 760 (net) ongoing jobs.

**Table 5. Work involved and skills audit for home retrofit<sup>62</sup>**

Retrofit activity	Skill needs	Labour (hours)
Audit	Trained assessor	1.0
Upgrade lighting	Unskilled	0.25
Weather-sealing	Semi-skilled	2.0
Ceiling insulation	Semi-skilled	2.0
Replace shower-head	Semi-skilled	0.25
Hot water – electric to solar	Plumber	4.0
Hot water – electric to heatpump	Electrician	2.0
Fridge upgrade	Unskilled	0
Dual flush toilet	Plumber	3.0
Install tap flow controllers	Semi-skilled	0.5

A study of green job opportunities undertaken by Environment Victoria found that jobs created by the energy efficiency industry are embedded across a wide range of existing industries including manufacturing, construction, finance, retail and services. Furthermore, more than 40 percent of water and energy efficiency jobs are likely to be semi-skilled, opening up opportunities for unemployed workers.<sup>61</sup> Table 5 shows the breakdown of skills required for a typical home retrofit.

Any government commitment to implementing a comprehensive household retrofit program for the ACT will need to be accompanied by investment in skills training, including through an expansion in apprenticeships, to ensure that sufficient workers with the required skills are available.

Appropriate investment in skills training, as well as a rigorous regulatory regime to ensure workplace safety, is also critical to ensure risks associated with home retrofit programs (as highlighted in the previous Federal Government's Homeowners Insulation Program) are appropriately managed and minimised.

# Appendix 1: Jobs created by a comprehensive home retrofit program

*The methodology has been adopted from the 2025 Roadmap: Overcoming the Barriers to Energy and Water Efficient Homes, recently published by the One Million Homes Alliance in Victoria.*<sup>63</sup>

Achieving the goal of ACT's housing stock meeting 5-star, 100 L/p/day standard by 2025 would support between **569 and 840 jobs (gross) during each year of the 10-year implementation phase**. ('Gross' job figures do not account for jobs moving from other parts of the economy.)

Additionally, it is estimated that the household savings achieved from **the retrofit program will support between 450 and 760 jobs (net) on an ongoing basis**. ('Net' job figures represent the effect of redirecting spending away from less jobs-intensive sectors to relatively more jobs-intensive sectors.)<sup>64</sup>

Jobs are created by energy efficiency investment in two ways:

- As a consequence of direct investment (i.e. manufacturing, trades and services resulting from one-off work to retrofit)

- As a consequence of redirection of money saved from energy bills to other parts of the economy.<sup>65</sup>

## HOW MUCH INVESTMENT WILL THE RETROFIT PROGRAM STIMULATE?

ACT has approximately 140,000 residential dwellings, an estimated 75 percent of which were built prior to 1995 when minimum performance standards were introduced for new homes. It is estimated this pre-1995 housing stock averages 1.7 stars in terms of performance.<sup>66</sup>

1.  $140,000 * 0.75 = 105,000$  dwellings need to be upgraded by an average of 3 stars.

Sustainability Victoria estimates that a 4.3 star increase can be achieved at an average cost of \$2,222 per star via building shell upgrades alone.<sup>67</sup> SV also notes that lighting and appliance upgrades are more cost effective overall than the building shell upgrades. It is therefore estimated that \$2,000 per star conservatively reflects the costs of improvements using building shell, lighting, and appliance upgrades. This is 10% lower than

**Table 6. Estimates of gross job support using international studies**

Author	For region	(A) Jobs/money	(B) AUD investment [from (4)]	(C) PPP conversion <sup>69</sup>	(D) Regional equivalent [(B)/(C)]	(E) Jobs supported [(D)*(A)]
Anderson <sup>70</sup>	USA	11 jobs/USD1m	63 million	1.5	42 million	462
ACEEE <sup>71</sup>	USA	20 jobs/USD1m	63 million	1.5	42 million	840
EEIF <sup>72</sup>	EU	19 jobs/EUR1m	63 million	2	31.5 million	599
OECD <sup>73</sup>	OECD	13 jobs/USD1m	63 million	1.44	43.75 million	569

building shell upgrades alone.

2. Improving a residential dwelling's energy performance by 1 star costs approximately \$2,000 per star
3. From (1) and (2): The package of measures outlined would stimulate investment of:  
 $105,000 \times 3 \times \$2,000 = \$630 \text{ million}$
4. Over ten years:  $\$630 \text{ million} / 10 = \$63 \text{ million per year}$

## JOBS SUPPORTED THROUGH THE 10-YEAR IMPLEMENTATION PHASE

International estimates for the number of gross jobs supported during the investment phase of energy efficiency range from 11 jobs/US\$1 million to 20 jobs/US\$1 million for regions including the USA, EU, and OECD (See Table 6). (Australian estimates are not available.)

To account for international differences in conditions, the proposed (Australian) expenditure has been converted to the relevant currency using the OECD's latest purchasing

power parity indicators.<sup>68</sup> As energy efficiency activities span a range of categories, the economy-wide indicator has been chosen in each case.

Based on the international studies presented in Table 6, the retrofit program can be reasonably expected to support between **569 and 840 jobs per year**. This is an estimate of gross jobs, not net additional jobs across the economy, and hence at least some of these jobs would be drawn from elsewhere in the economy. However, given that many trades and services roles associated with retrofits are low or semi-skilled, efficiency investment provides significant scope for expanding opportunities for unemployed workers.

## ONGOING JOBS SUPPORTED THROUGH HOUSEHOLD SAVINGS

Ongoing jobs are supported by resources freed up by household savings. Money not being spent on energy bills will be available for spending elsewhere in the economy and create ongoing jobs beyond the life of the



direct efficiency investment.

5. The average annual household energy bill in the ACT is between \$2,000 and \$3,400
6. A 5-star home can cut bills by 40 percent compared with business as usual<sup>74</sup>
7. From (5) and (6): The Roadmap would save an average household \$800 - \$1,360 per year
8. From (1) and (7): The retrofit program would achieve savings of between \$84 and \$142.8 million per year

Anderson et. al, (2014) estimates a net gain of 8 jobs per US\$1 million of consumer savings.<sup>75</sup>

9. From (8) and Table 6 (PPP conversion): Retrofit would support AU\$84 m/ 1.5 \* 8 to AU\$142.8 m/ 1.5 \* 8)  
**= 448 to 761 ongoing jobs (net)**  
beyond the life of the direct efficiency investment

# Endnotes

- 1 Sydney Morning Herald, <http://www.smh.com.au/national/public-service/austerity-drive-wipes-out-one-in-11-federal-government-jobs-in-canberra-20141112-1l1lxb#ixzz3iePbCCqS>
- 2 Canberra Times, <http://www.canberratimes.com.au/act-news/act-unemployment-rate-holds-steady-as-national-rate-drops-to-61-percent-20150416-1mmot4.html>
- 3 EV (2009) Victoria – The Green Jobs State: Seizing the opportunities, Environment Victoria
- 4 See Appendix 1.
- 5 DEWHA (2008) Energy Use in the Australian residential sector 1986-2020, Department of Environment, Water, Heritage and the Arts, Commonwealth of Australia
- 6 ACT Government (2013) Submission to Senate Select Committee on Electricity Price Rises
- 7 Jacobs (2014) Energy Efficiency Improvement Scheme Review, Prepared for ACT Government, Fig. 2.2, p. 4, citing ABS 6530.0 Household expenditure survey Australia 2009-10
- 8 From Fig. 1 above
- 9 Pitt & Sherry (2014) Reporting the energy efficiency of residential tenancies in the ACT: Options Analysis, Prepared for ACT Environment and Sustainable Development Directorate, May 2014, p. 1
- 10 Pitt & Sherry (2015) Interim ACT Greenhouse Gas Inventories for 2012-13 and 2013-14, Prepared for Environment and Planning Directorate, ACT Government
- 11 ACT Government (2013) Submission to Senate Select Committee on Electricity Price Rises
- 12 Pitt & Sherry (2015) Past and projected future components of electricity supply to the ACT, and resultant emissions intensity of electricity supplied. Prepared for ACT Government, March 2015, Table 1, Fig. 1 pages 2 and 3
- 13 Jacobs (2014) Energy Efficiency Improvement Scheme Review, Prepared for the ACT Government
- 14 Pitt&Sherry (2015) Past and projected future components of electricity supply to the ACT, and resultant emissions intensity of electricity supplied. Prepared for ACT Government, March 2015
- 15 ACT Government (2014) ACT Water Strategy 2014-44, Environment and Planning Directorate, Fig. 6, p. 20
- 16 ABS (2014) Water Account 2012-13, Pub. 4610.0, Australian Bureau of Statistics.
- 17 ACT Government (2014) ACT Water Strategy 2014-44
- 18 CSIRO, <https://blogs.csiro.au/climate-response/stories/explainer-heatwaves-in-australia/>
- 19 Barnett, A. (2015) "Cold weather is a bigger killer than heat – here's why", The Conversation at <https://theconversation.com/cold-weather-is-a-bigger-killer-than-extreme-heat-heres-why-42252>
- 20 Barnett, G. et. al. (2013), Pathways to climate adapted and healthy low-income housing, National Climate Adaptation Research Facility, Gold Coast
- 21 Chester, L. (2013) The impacts and consequences for low-income Australian households of rising energy prices, University of Sydney; ACOSS (2013) Energy

- Efficiency and People on Low Incomes, Australian Council of Social Service
- 22 ACOSS (2013); Barnett, G. et. al. (2013)
- 23 Chester (2013) Table 3., p. 4, citing ABS (2011) 6523.0 Household Income and Income Distribution Australia
- 24 Chester, L. (2013)
- 25 Jacobs (2014)
- 26 "Government reviews concessions across the board in search for savings", Canberra Times, March 17, 2015
- 27 Chester, L. (2013)
- 28 DEWHA (2008) Energy Efficiency Rating and House Price in the ACT, prepared for the National Framework for Energy Efficiency
- 29 ACTSmart Energy Saving Guide, [http://www.actsmart.act.gov.au/\\_\\_data/assets/pdf\\_file/0012/697287/130451-Energy-Smart-Booklet-Accessible.pdf](http://www.actsmart.act.gov.au/__data/assets/pdf_file/0012/697287/130451-Energy-Smart-Booklet-Accessible.pdf)
- 30 ACTSmart services: overview and insights. Presentation, Environment and Planning Directorate
- 31 Energy Efficient Strategies (2012) The value of insulation based residential energy savings measures in Australia, Prepared for Insulation Council of Australia and New Zealand, Table 5, p. 11
- 32 SV (2014) Household Energy Report, Sustainability Victoria
- 33 SV (2104) Household Energy report, Sustainability Victoria, Table 3., p. 9
- 34 ACT Government (2015) AP2 - The climate change strategy and action plan for the ACT, Implementation Update 2015
- 35 <http://www.businessspectator.com.au/news/2015/8/24/energy-markets/act-government-divest-fossil-fuels-and-target-100-renewable-energy>
- 36 ACT Government (2015) Energy Efficiency Improvement Scheme: Setting key scheme parameters to 2020. Regulatory Impact Assessment, p. 19
- 37 Assumes 142,000 households based on ABS household projections for 2013, [www.abs.gov.au/AUS-STATS/abs@.nsf/DetailsPage/3236.02006%20to%202031?OpenDocument](http://www.abs.gov.au/AUS-STATS/abs@.nsf/DetailsPage/3236.02006%20to%202031?OpenDocument)
- 38 Jacobs (2014), p. 13
- 39 Jacobs (2014), Fig. 4.2 p. 12
- 40 Energy Efficient Strategies (2012)
- 41 Energy Efficient Strategies (2012), Table 6, p. 11
- 42 Jacobs (2014), p. 27
- 43 Those built before the introduction of minimum performance standards
- 44 DEWHA (2008) Energy efficiency rating and house price in the ACT, Department of Environment, Water, Heritage and the Arts. The 5000 homes built after 1995 examined in the study had an average rating of 1.7 stars
- 45 See Appendix 1
- 46 See "Overcoming the Barriers to Energy and Water Efficient Housing" at [www.onemillionhomes.org.au](http://www.onemillionhomes.org.au)
- 47 DEWHA (2008)
- 48 Tenants Union ACT (2013) "Submission to Consultation Paper exploring issues and options for an energy efficiency disclosure program for residential tenancies in the ACT"
- 49 Pitt & Sherry (2014)
- 50 Tenants Union (2013); ACTCOSS (2011) "Comment on the Residential Tenancies (Minimum Housing Standards) Amendment Bill 2011"; ACTCOSS and Conservation Council ACT (2014) "Comments on the review of the Energy Efficiency Improvement Scheme"
- 51 ACTCOSS (2011) "Comment on the Residential Tenancies (Minimum Housing Standards) Amendment Bill 2011"
- 52 Hulse, K. et. al. (2015) Supply shortages and affordability outcomes in the private rental sector: short and longer term trends. Australian Housing and Urban

- Research Institute Final Report 241, Table 7, p. 27
- 53 Lovering, M. (2013) "Can low income tenants afford to rent an energy efficient home?" AHURI Evidence Review 040, AHURI at [http://www.ahuri.edu.au/housing\\_information/review/evrev040](http://www.ahuri.edu.au/housing_information/review/evrev040)
- 54 Lovering, M. (2013)
- 55 "Canberra property prices rise 2.4 percent in year to June", Canberra Times, July 1 2015, at <http://www.canberratimes.com.au/act-news/canberra-property-values-increase-24-per-cent-in-year-to-june-20150701-gj2d8c.html>
- 56 Chester (2103); ACOSS (2013)
- 57 ACT Government (2103) Outreach Energy and Water Efficiency Program: Case Study report, June 2013
- 58 ACTCOSS and Conservation Council ACT (2014), Recommendation 8, pg. 8
- 59 Chester (2013)
- 60 AIHW (2014) Social Housing Dwellings, Table 1. Australian Institute of Health and Welfare at <http://www.aihw.gov.au/housing-assistance/haa/2015/social-housing-dwellings/>
- 61 EV (2009)
- 62 EV (2009)
- 63 August 2015, at: [www.onemillionhomes.org.au](http://www.onemillionhomes.org.au)
- 64 ACEEE (2011) "How does energy efficiency create jobs?" American Council for an Energy Efficient Economy at <http://aceee.org/sites/default/files/pdf/fact-sheet/ee-job-creation.pdf>
- 65 Anderson et. al. (2014), Assessing National Employment Impacts of Investment in Residential and Commercial Sector Energy Efficiency, Prepared for US Department of Energy, PNNL\_23402, p. ii
- 66 DEWHA (2008) study 5000 homes found average performance to be 1.7 stars
- 67 SV (2014), Table 3, excluding double glazing
- 68 OECD (2011) PPP benchmarking, available at [stats.oecd.org/Index.aspx?DataSetCode=PPP2011](http://stats.oecd.org/Index.aspx?DataSetCode=PPP2011). C.f. Tables 1.2, 1.12, and 2.2.
- 69 OECD (2011)
- 70 Anderson et. al. (2014).
- 71 ACEEE (2011) "How does energy efficiency create jobs?" American Council for an Energy Efficient Economy at <http://aceee.org/sites/default/files/pdf/fact-sheet/ee-job-creation.pdf>
- 72 Janssen, R. and D. Staniaszek (2012) How many jobs? A survey of the employment impacts of investment in energy efficiency of buildings, Energy Efficiency Industrial Forum
- 73 OECD (2012) Energy: OECD Green Growth Studies, OECD Publishing, p. 75
- 74 SV (2014)
- 75 Anderson et. al. (2014)



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