# Energy efficiency critical in providing affordable clean energy for people on low-incomes

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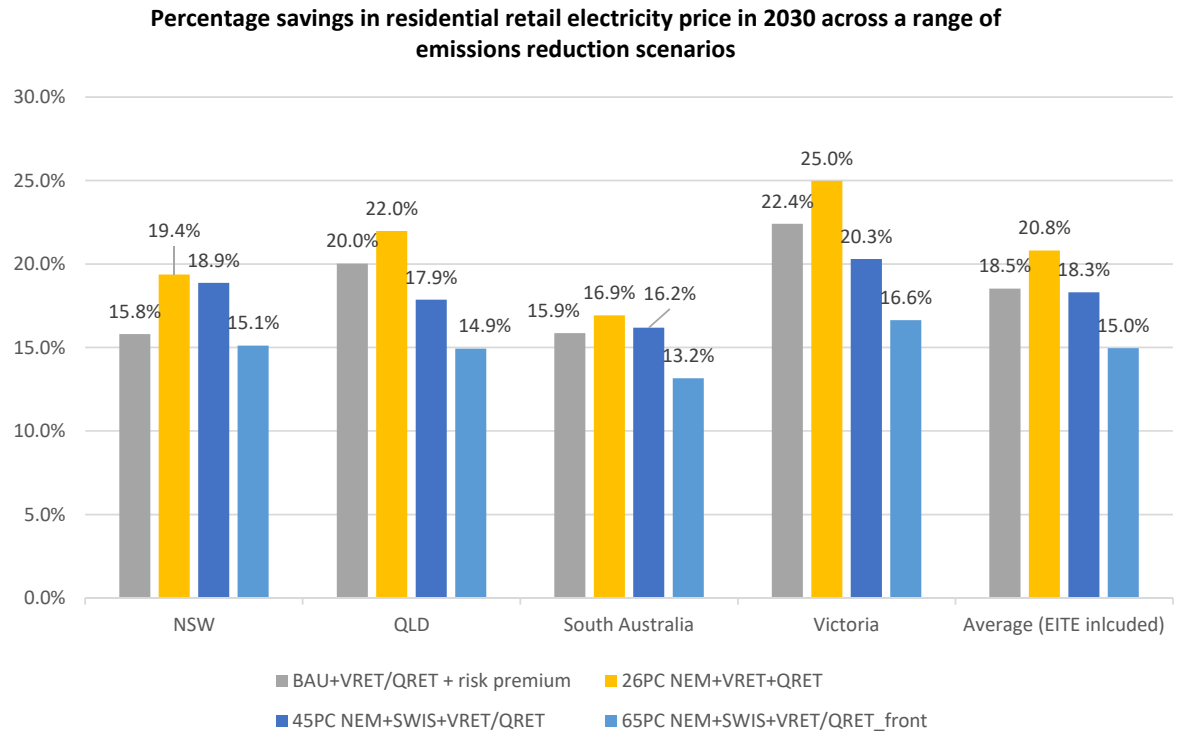
This project was funded by Energy Consumers Australia Limited (www.energyconsumersaustralia.com.au) as part of its grants process for consumer advocacy and research projects.

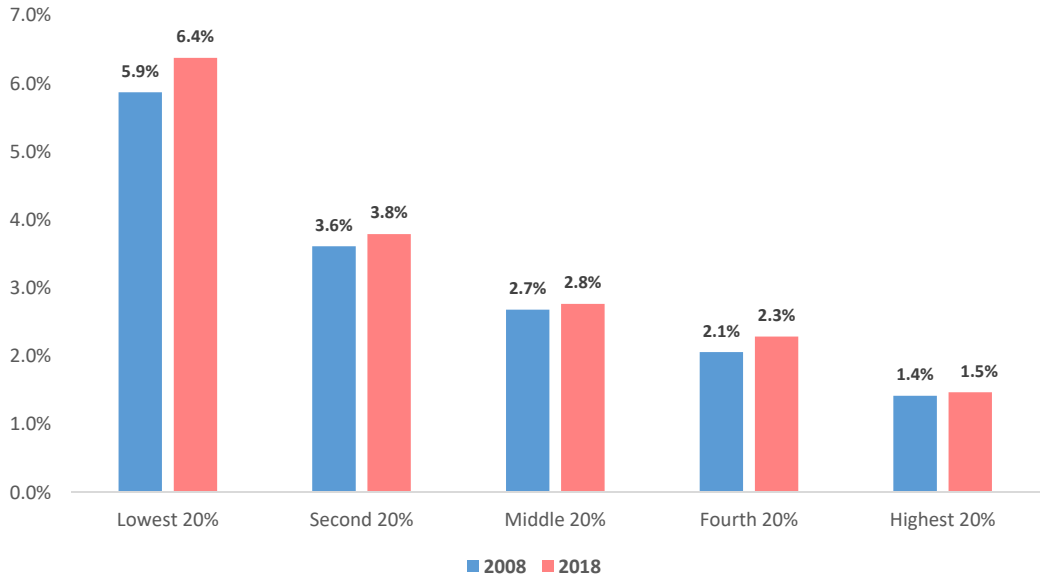
# Background

Our first report looked at the impact of an electricity sector emissions reduction scheme on households.



# Background

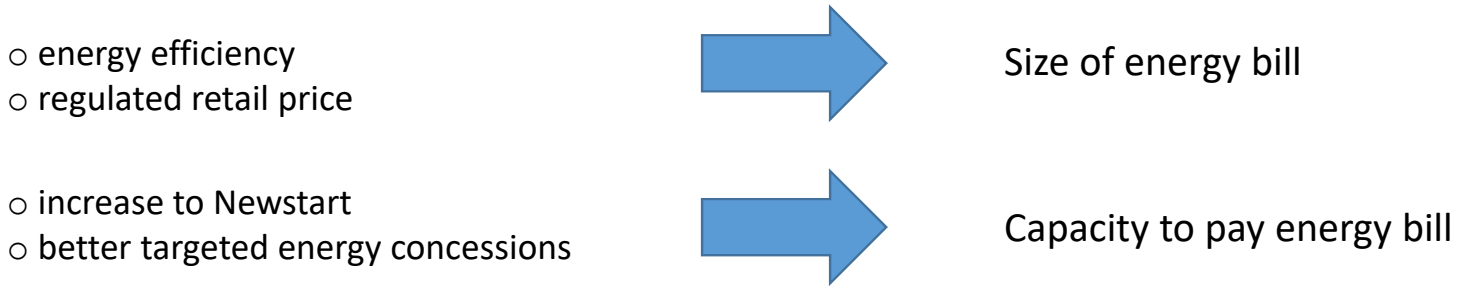
The second report looked the current impacts of high energy prices on household types and how it had changed over time




People on Newstart and Youth Allowance, sole parents, lone pensioners and renters are most vulnerable

# Background

- The Third piece of analysis, we wanted to explore the distributional impact of the observed price change from an emissions reduction mechanism on low-income earners.
- And, assuming low-income households would still be paying disproportionately more, we wanted to model a number of policy solutions that could reduce the amount low-income households spend on energy and thereby support a faster transition to clean energy:

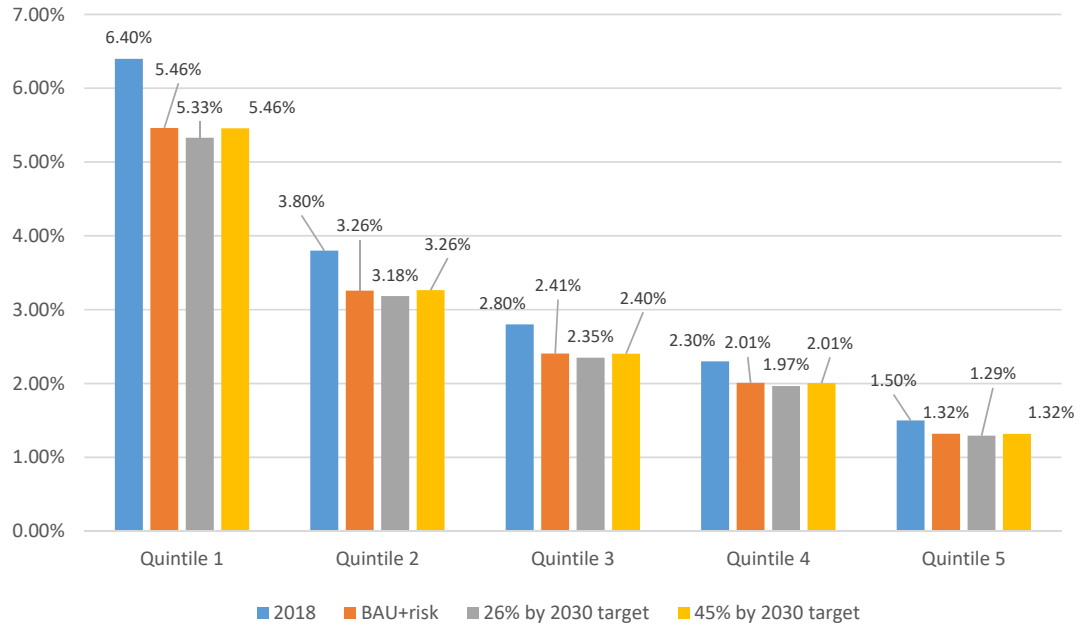


# Methodology

- ACOSS and BSL commissioned Ass. Prof Ben Phillips, ANU to do the analysis.
- The analysis underpinning this report was conducted using PolicyMod, a detailed microsimulation model of the Australian tax and transfer system.
- The model is based on the 2015–16 Australian Bureau of Statistics (ABS) Survey of Income and Housing.
- For this research we used both the standard PolicyMod and a version based only on the records contained in the Household Expenditure Survey (HES), which includes expenditure data on energy for a range of households including whether solar panels are used.
- We also used the ABS Household Energy Consumption (HECS) 2012 survey to develop statistical models (logistic and linear regressions) to impute the share of energy expenditure for the fixed supply charges and the variable supply charges.

# Distributional analysis of emissions reduction mechanism

- The NEG modelling from our first report found that energy prices would decrease under all scenarios modelled - business-as-usual (BAU), 26%, 45%, and 65% emissions reductions targets.
- We modelled the changes in retail price data from the NEG report, and applied it to the unit records in PolicyMod based on updated HES data, to analyse any change in energy expenditure as a percentage of income for households against three of the emissions reduction scenarios – BAU, 26% target and 45% emissions reduction target.



# Summary of results from scenarios 2, 3 and 4

- Scenario 2 - A fair regulated retail price could save $261 to $436 per annum for 37-60% of households and reduce energy expenditure as a percentage share of income for lowest-income households from the current 7.6% to 6.1%.

- Scenario 3 - Increasing Newstart by $75 a week would reduce energy expenditure as a percentage share of income for Newstart households from the current 6.3% to 5.6%, a $110 increase would reduce it to 5.3%.

- Scenario 4 - A shift to percentage-based concessions improves equity, responsiveness to change in energy bills, and provides greater support to couple and single parent families.

# Scenario 1: Home energy efficiency and rooftop solar measures

## OVERVIEW

- The energy performance of Australia's residential buildings is low by world standards.
- Two of the most effective ways to reduce the size of energy bills are energy efficiency and the installation of rooftop solar.
- Low-income households lack choice and control.

**Scenario 1a.** Grant of $2,000 for houses and apartments, targeted at people on low incomes.

**Scenario 1b.** Grant of $5,000 for houses and $2,000 for apartments, targeted at people on low incomes.

**Scenario 1c.** Energy efficiency standard for rental properties, targeted at 75% of rental properties, equivalent to $5,000 for houses and $2,000 for apartments.

- Department of Environment and Energy provided costs and savings data for the three scenarios. The appliances included hot water, reverse cycle air-conditioning, LED lights, solar, clothes dryers and gap sealing.
- Using PolicyMod model we imputed the assumed savings for the energy efficiency measures at the household level.

# Scenario 1: Home energy efficiency and rooftop solar measures

## Grant of $2,000 for houses, targeted at people on low incomes

| State | Location | NCC Climate Zone | 4–5 Star, 3.5kW air-conditioner | | LED Lights | | Total annual savings |
|---|---|---|---|---|---|---|---|
| | | | Cost | Annual Energy Saved | Cost | Annual Energy Saved | |
| ACT | RURAL | 7 | $780–$1,300 | $246 | $310.50 | $197.85 | $443.85 |
| ACT | RURAL | 7 | $780–$1,300 | $246 | $310.50 | $197.85 | $443.85 |
| ACT | METRO | 7 | $780–$1,300 | $246 | $310.50 | $197.85 | $443.85 |
| ACT | METRO | 7 | $780–$1,300 | $246 | $310.50 | $197.85 | $443.85 |
| TAS | RURAL | 7 | $780–$1,300 | $246 | $310.50 | $197.85 | $443.85 |
| TAS | RURAL | 7 | $780–$1,300 | $246 | $310.50 | $197.85 | $443.85 |
| TAS | METRO | 7 | $780–$1,300 | $246 | $310.50 | $197.85 | $443.85 |
| TAS | METRO | 7 | $780–$1,300 | $246 | $310.50 | $197.85 | $443.85 |
| NSW | METRO | 5 | $780–$1,300 | $215 | $310.50 | $197.85 | $412.85 |
| NSW | METRO | 5 | $780–$1,300 | $215 | $310.50 | $197.85 | $412.85 |
| NSW | RURAL | 4 | $780–$1,300 | $215 | $310.50 | $197.85 | $412.85 |
| NSW | RURAL | 4 | $780–$1,300 | $215 | $310.50 | $197.85 | $412.85 |
| VIC | METRO | 7 | $780–$1,300 | $246 | $310.50 | $197.85 | $443.85 |
| VIC | METRO | 7 | $780–$1,300 | $246 | $310.50 | $197.85 | $443.85 |
| VIC | RURAL | 7 | $780–$1,300 | $246 | $310.50 | $197.85 | $443.85 |
| VIC | RURAL | 7 | $780–$1,300 | $246 | $310.50 | $197.85 | $443.85 |
| QLD | METRO | 2 | $780–$1,300 | $177 | $310.50 | $197.85 | $374.85 |
| QLD | METRO | 2 | $780–$1,300 | $177 | $310.50 | $197.85 | $374.85 |
| QLD | RURAL | 3 | $780–$1,300 | $177 | $310.50 | $197.85 | $374.85 |
| QLD | RURAL | 3 | $780–$1,300 | $177 | $310.50 | $197.85 | $374.85 |
| SA | METRO | 5 | $780–$1,300 | $172 | $310.50 | $197.85 | $369.85 |
| SA | METRO | 5 | $780–$1,300 | $172 | $310.50 | $197.85 | $369.85 |
| SA | RURAL | 4 | $780–$1,300 | $215 | $310.50 | $197.85 | $412.85 |
| SA | RURAL | 4 | $780–$1,300 | $215 | $310.50 | $197.85 | $412.85 |

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# Scenario 1: Home energy efficiency and rooftop solar measures

## Grant of $5,000 for houses, targeted at people on low incomes

| State | Location | NCC Climate Zone | Hot water | | | 4–5 Star, 3.5kW air conditioner | | LED Lights | | Total annual savings |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | GAS / ELECTRIC | Additional Upfront Cost ($) to replace old model with a more efficient model | Annual Energy Saved (state prices) | Cost | Annual Energy Saved | Cost | Annual Energy Saved | |
| ACT | RURAL | 7 | GAS | $864 | $223 | $780–$1,300 | $246 | $310.50 | $197.85 | $666.85 |
| ACT | RURAL | 7 | ELECTRIC | $501 | $822 | $780–$1,300 | $246 | $310.50 | $197.85 | $1,265.85 |
| ACT | METRO | 7 | GAS | $864 | $223 | $780–$1,300 | $246 | $310.50 | $197.85 | $666.85 |
| ACT | METRO | 7 | ELECTRIC | $501 | $822 | $780–$1,300 | $246 | $310.50 | $197.85 | $1,265.85 |
| TAS | RURAL | 7 | GAS | $864 | $290 | $780–$1,300 | $246 | $310.50 | $197.85 | $733.85 |
| TAS | RURAL | 7 | ELECTRIC | $501 | $691 | $780–$1,300 | $246 | $310.50 | $197.85 | $1,134.85 |
| TAS | METRO | 7 | GAS | $864 | $290 | $780–$1,300 | $246 | $310.50 | $197.85 | $733.85 |
| TAS | METRO | 7 | ELECTRIC | $501 | $691 | $780–$1,300 | $246 | $310.50 | $197.85 | $1,134.85 |
| NSW | METRO | 5 | GAS | $864 | $272 | $780–$1,300 | $215 | $310.50 | $197.85 | $684.85 |
| NSW | METRO | 5 | ELECTRIC | $501 | $874 | $780–$1,300 | $215 | $310.50 | $197.85 | $1,286.85 |
| NSW | RURAL | 4 | GAS | $864 | $272 | $780–$1,300 | $215 | $310.50 | $197.85 | $684.85 |
| NSW | RURAL | 4 | ELECTRIC | $501 | $791 | $780–$1,300 | $215 | $310.50 | $197.85 | $1,203.85 |
| VIC | METRO | 7 | GAS | $864 | $175 | $780–$1,300 | $246 | $310.50 | $197.85 | $618.85 |
| VIC | METRO | 7 | ELECTRIC | $501 | $936 | $780–$1,300 | $246 | $310.50 | $197.85 | $1,379.85 |
| VIC | RURAL | 7 | GAS | $864 | $175 | $780–$1,300 | $246 | $310.50 | $197.85 | $618.85 |
| VIC | RURAL | 7 | ELECTRIC | $501 | $936 | $780–$1,300 | $246 | $310.50 | $197.85 | $1,379.85 |
| QLD | METRO | 2 | GAS | $864 | $496 | $780–$1,300 | $177 | $310.50 | $197.85 | $870.85 |
| QLD | METRO | 2 | ELECTRIC | $501 | $633 | $780–$1,300 | $177 | $310.50 | $197.85 | $1,007.85 |
| QLD | RURAL | 3 | GAS | $864 | $519 | $780–$1,300 | $177 | $310.50 | $197.85 | $893.85 |
| QLD | RURAL | 3 | ELECTRIC | $501 | $736 | $780–$1,300 | $177 | $310.50 | $197.85 | $1,110.85 |
| SA | METRO | 5 | GAS | $864 | $350 | $780–$1,300 | $172 | $310.50 | $197.85 | $719.85 |
| SA | METRO | 5 | ELECTRIC | $501 | $1,064 | $780–$1,300 | $172 | $310.50 | $197.85 | $1,433.85 |
| SA | RURAL | 4 | GAS | $864 | $349 | $780–$1,300 | $215 | $310.50 | $197.85 | $761.85 |
| SA | RURAL | 4 | ELECTRIC | $501 | $963 | $780–$1,300 | $215 | $310.50 | $197.85 | $1,375.85 |

# Scenario 1: Home energy efficiency and rooftop solar measures

Grant of $5,000 for houses (invested in solar), targeted at people on low incomes

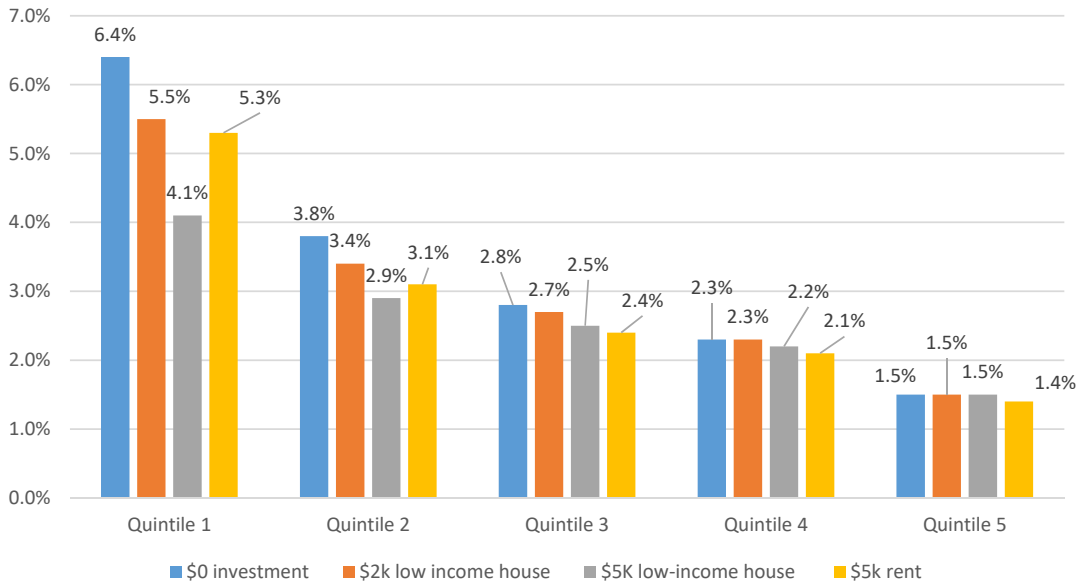
| | | kW Installed Capacity | Cost | Total Saving | Payback (years) |
|---|---|---|---|---|---|
| ACT | METRO | 4 | $3,780.00 | $1,730.38 | 2.18 |
| TAS | RURAL | 4 | $5,600.00 | $934.70 | 5.99 |
| TAS | METRO | 4 | $5,600.00 | $900.90 | 6.22 |
| NSW | METRO | 4 | $4,250.00 | $993.33 | 4.28 |
| NSW | RURAL | 4 | $4,250.00 | $1,025.98 | 4.14 |
| VIC | METRO | 4 | $4,450.00 | $1,293.84 | 3.44 |
| VIC | RURAL | 4 | $4,450.00 | $1,097.20 | 4.06 |
| QLD | METRO | 4 | $4,750.00 | $1,024.53 | 4.64 |
| QLD | RURAL | 4 | $4,750.00 | $1,139.12 | 4.17 |
| SA | METRO | 4 | $4,280.00 | $1,749.64 | 2.45 |
| SA | RURAL | 4 | $4,280.00 | $1,474.94 | 2.90 |

# Scenario 1: Home energy efficiency and rooftop solar measures

## RESULTS

- The modelling finds that for a one-off capital investment of $2,000 for apartments and $5,000 for houses, average annual savings ranged from $289 for apartments to $1,139 for houses.
- Figure below shows positive impact on reducing proportion of income spent on energy.
- Rental standards good for single parents (many of whom rent), but not be as good for pensioners who own their own home.

**Figure 2. Electricity and gas expenditure as a percentage share of income by income quintiles and by different energy efficiency scenarios**



# Scenario 1: Home energy efficiency and rooftop solar measures

## SUMMARY OF RECOMMENDATIONS

1. States and territories should mandate minimum energy efficiency performance standards for rental properties, as part of a broader set of healthy and habitable rental housing standards. Include provision of incentives for landlords and safeguards to avoid significant rent increases.

2. Federal, state and local governments should work cooperatively with energy retailers to co-fund ongoing programs to provide access to energy efficiency and solar photovoltaic technology for low-income households.

3. Federal and state governments should develop and implement programs to improve the energy efficiency and solar access of all social housing, community and other “affordable” housing.

4. Federal and state governments should invest in energy efficiency and clean energy for remote Aboriginal and Torres Strait Islander communities.

5. COAG should agree to improve minimum performance standards for residential buildings to a 7-star National House Energy Rating Scheme (NatHERS) rating. Support for social and affordable housing to comply.

# Thank you

## Contacts:

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