

Energy poverty set to escalate, unless we adopt programmes to retrofit housing and stimulate post COVID economy

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What is energy poverty?

Australia faces three major and growing challenges in the energy sector: reducing greenhouse gas emissions (GHG) and committing to climate change mitigation strategies as per the Paris Agreement; increasing energy security and reliability, particularly during peak demand periods and extreme weather events, such as heatwaves; and ensuring affordable energy services, especially for vulnerable households, in a poorly regulated market. The latter relates to energy poverty, an emerging issue that results from high energy prices, low incomes, and poor housing energy efficiency.

Being unable to pay energy bills, restricting energy consumption to the detriment of health and wellbeing, and having relatively low income and spending a high proportion of it on energy is a problem for millions of people across the world and one of the biggest challenges of the 21st century for many developed nations, including Australia.

This situation is not likely to change – the impact of climate change, temperature extremes and post-COVID trends of spending more time or even working from home is increasing household energy expenditure as we speak, and this is to continue well into our future. Adding to that, most of Australia's existing housing stock is old and was constructed prior to the introduction of the first national housing minimum energy efficiency requirements in 2005.

How bad is energy poverty and who does it affect most?

Over the last decade the proportion of Australian individuals and families suffering from energy poverty has increased substantially. Estimates are that around [one in four](#) Australian households are suffering from energy poverty. The primary reason for this growth is the increase in energy prices far exceeding wage increases and the CPI. For example in 2017, electricity prices increased by 12%, which was six times the average [pay rate rise](#). A [2017 survey](#) comparing Australia's retail electricity prices to countries in the EU and the US, found that South Australia had the most expensive retail electricity prices in the world. NSW had the fourth highest, Queensland the fifth and Victoria the sixth highest. Electricity prices in South Australia were almost three times higher than prices in the US.

Energy poverty can have [serious consequences](#). In order to cope with the price of energy, households tend to lessen the [use of their heaters in winter](#) and air-conditioning in summer. In the context of climate change and the increase in the number of extreme weather events, this can have [serious adverse health impacts](#). Another negative consequence is that low-income households cut down on their [cooking and eating of nutritional food](#) so as to save on energy usage. It can also intensify loneliness due to people limiting their social activities so as to ensure they are able to pay their energy bill.

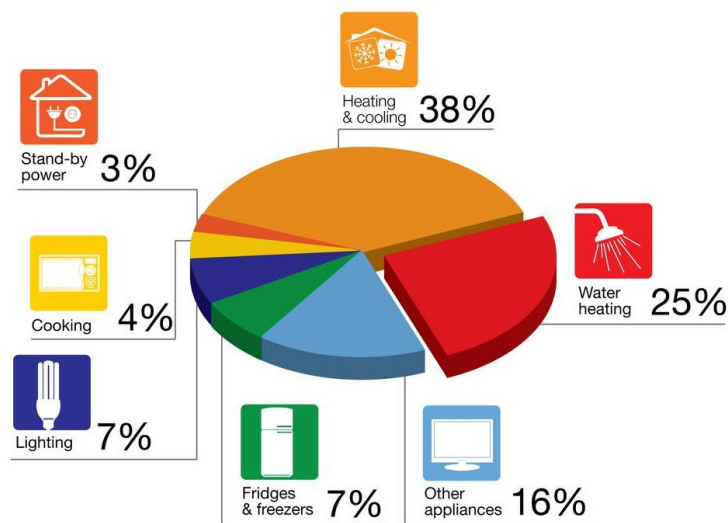
The impacts of energy poverty on the population are varied. Some groups are [particularly vulnerable](#). Thus older people, people with a disability and or chronic health conditions, and low-income households with children, would be particularly hard-hit by energy poverty. Particularly cold

or warm homes can exacerbate existing cardiovascular and respiratory conditions. Mental health can also be affected.

How does it manifest in our homes?

Household energy use is highly dependent on building characteristics, climate, appliances and system characteristics, tenure type, and occupant behaviour, which can be related to social and economic conditions. However, in the typical Australian home, energy consumption according to end-use source is approximately two thirds (63%) heating and cooling and water heating and both are directly associated with the climate. The remaining third is attributed to appliances, lighting and cooking.

Figure 1 Breakdown of energy costs in Australian housing.



Australia is a very slow adopter of energy efficiency improvements, with national housing minimum standards required from 2003 onwards. Other countries such as the UK, had introduced their minimum standards (which are higher than ours) from the mid 1980s. Furthermore, these minimum energy efficiency requirements have not changed since 2010. Currently, new developments and major renovations have to meet a minimum 6-star NatHERS (Nationwide House Energy Rating Scheme) rating. Overwhelmingly, the energy efficiency of most housing stock is very poor. Table 1 shows the annual average electricity costs per square metre for different star ratings. It shows that a Canberra 2 star property (the average Aussie stock is 1.8 Stars) electricity costs \$24.82 /m² pa, whereas a 10 star home costs 13 cents/m² pa. The average floor size of an Australian home is 186.3 square metres so annually a difference of total \$4623.97 electricity costs for the 2 star and \$24.20 for the 10 Star.

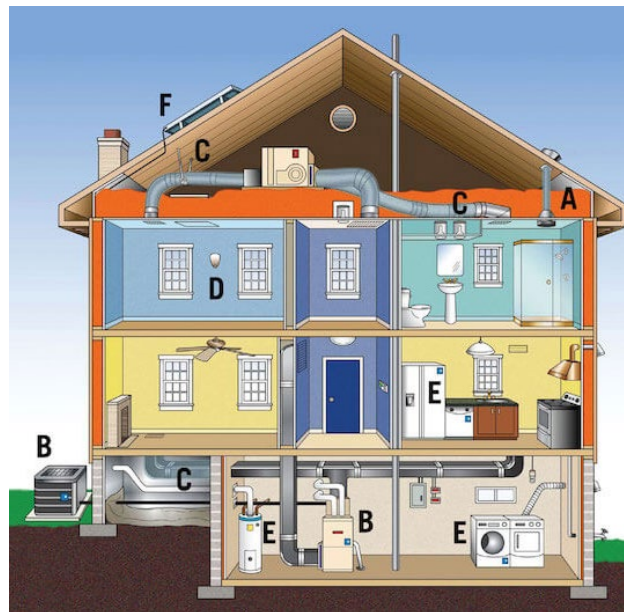
Table 1 – Electricity Costs by Star Rating in Australian Cities.

Location	Climate Zone	0.5 ★			2 ★			6 ★			10 ★		
		MJ/m2. annum	KWh/m2. annum	Electricity costs in AU\$ per m2.annum	MJ/m2. annum	KWh/m2. annum	Electricity costs in AU\$ per m2.annum	MJ/m2. annum	KWh/m2. annum	Electricity costs in AU\$ per m2.annum	MJ/m2. annum	KWh/m2. annum	Electricity costs in AU\$ per m2.annum
Adelaide	16	584	162.22	\$ 61.03	325	90.28	\$ 33.96	96	26.67	\$ 10.03	3	0.83	\$ 0.31
Brisbane	10	245	68.06	\$ 16.02	139	38.61	\$ 9.09	43	11.94	\$ 2.81	10	2.78	\$ 0.65
Canberra	24	957	265.83	\$ 73.26	547	151.94	\$ 41.88	165	45.83	\$ 12.63	2	0.56	\$ 0.15
Melbourne	21	676	187.78	\$ 43.70	384	106.67	\$ 24.82	114	31.67	\$ 7.37	2	0.56	\$ 0.13
Sydney	17	286	79.44	\$ 21.89	148	41.11	\$ 11.33	39	10.83	\$ 2.99	6	1.67	\$ 0.46

(Horne et al., 2005; Berry and Marker, 2015; Noble and Martinelli, 2009; Sustainability Victoria, 2014; Willand, Maller and Ridley, 2019)

What remedies are there?

Figure 2 – energy efficient retrofit measures.



This figure illustrates the simple measures we can take to reduce energy use. The list below describes those measures.

- A - sealing air leaks and adding insulation.
- B – improving heating and cooling systems.
- C – sealing ductwork.
- D – Replacing windows with secondary or double glazed units.
- E – upgrading lighting, appliances and water heating equipment.
- F – installing renewable energy systems.

As you can see the measures range from low cost (sealing air leaks and installing roof insulation) to high cost (replacing windows). Homeowners should look at costs of the measures and payback periods (i.e. how much energy / cost do they save). Clearly there are low hanging fruit, so to speak, such as insulation and sealing leaks which should top the ‘to do’ list. It is much more straightforward in the owner occupier sector of course.

The more expensive measures may require a loan but should translate into higher capital value, as well as lower operating costs. The main barrier to adoption in the rented sector is that it requires a landlord to initiate the work. In this sector, we experience the ‘split incentive’; whereby the person who pays for the measures does not directly and immediately benefit from it. The landlord pays and the tenant receives lower bills. Of course, the landlord may also get a higher rent or less vacancy, and when they come to sell a higher sale price; so informed landlords may implement energy efficiency.

Energy Efficient Retrofit Programmes to boost the post COVID economy

So we have a stock of poorly performing residential buildings, leaking greenhouse gas and money. Surely we can improve performance, lower our energy bills, reduce our carbon footprint and stimulate the economy; the question is how do we do it? It requires action from the government to

establish a well thought out programme to subsidize energy retrofit, say with insulation, whereby homeowners and landlords can get work done and start benefitting from lower energy bills. Jobs are created in quoting for and installing the insulation. This increase in disposable income for households and installers is ploughed back into the economy in other sectors such as retail and hospitality, travel and tourism for example. The costs of energy poverty on the health system are reduced. It is not rocket science and it is not new. We have had schemes (Pink Batts) in the past, and internationally other countries have stimulated their economies and reduced energy poverty concurrently, with programmes. Other initiatives can be set up to retrofit secondary and double glazing and the installation of renewables. All these measures will lower our per capita carbon footprints.

Final thoughts

Having defined energy poverty, it is a shock to learn how many Australians are experiencing it. It is a depressing to realise that energy poverty will get even worse as a result of the economic situation and COVID. This is exacerbated by a having a stock of housings that poorly designed and built in respect of energy efficiency. It does not have to be this way, however, as we saw above, there are multiple measures that can be taken from low to high cost. Moreover if we are really smart, we can use stimulus packages for energy efficiency to invigorate economic activity post COVID, and have lower greenhouse gas emissions, lower energy bill, and most importantly; eliminate energy poverty.