Frozen out: The Burden of Energy Deficiency on People who Rent

Better Renting

Rental properties are 'energy deficient': the lack of energy efficiency places a burden on renters in the form of increased energy expenditure or harmful indoor temperatures. This report estimates the monetary value of this burden by calculating the worth of the thermal energy that energy deficient rental properties lack. Drawing upon six years of real estate data, we calculate the annual burden of energy deficiency in the ACT to be $39 million. The burden is particularly heavy for vulnerable renters, such as those on a low-income or living with disability. This analysis strengthens the arguments for minimum energy efficiency standards for rental properties.

Introduction

Landlords are not responsible for their tenants' power bills and thus have little incentive to invest in energy efficiency. As a consequence, people who rent live in properties that are less energy efficient.[1] Compared to people living in more efficient homes, renters must choose between spending more to achieve the same degree of thermal comfort or enduring dangerous indoor temperatures through winter. Whether in the form of inflated power bills or threatening indoor temperatures, this is the burden renters are currently made to bear.

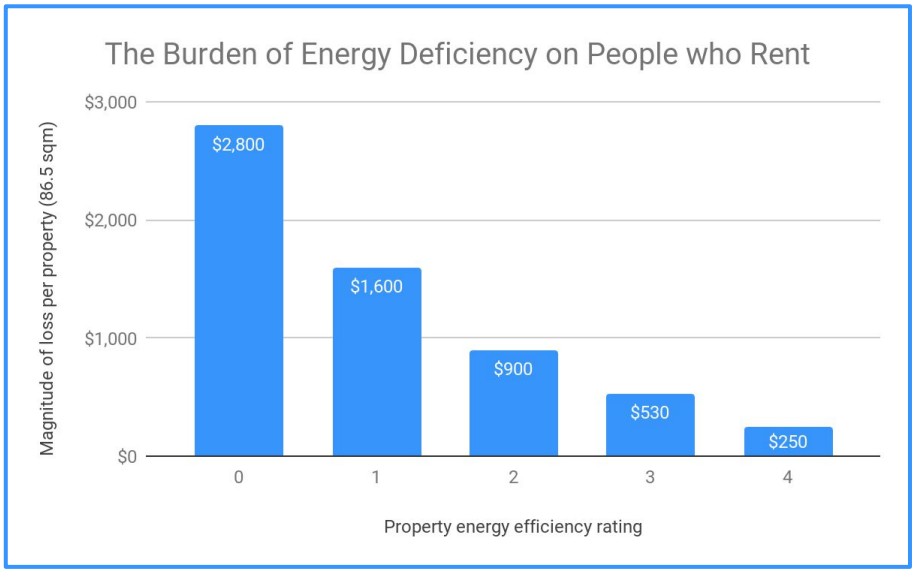
This report draws upon energy efficiency rating (EER) disclosures from six years of rental transactions in the ACT to examine the loss that renters face from living in energy deficient properties. This report attempts to put a monetary value on this loss to facilitate understanding and communication and enable comparisons with the cost of potential solutions, such as minimum energy efficiency standards for rental properties.

Method

An energy efficiency rating (EER) corresponds to a particular energy requirement per square metre of floor area to keep a property at an appropriate temperature in Canberra's climate.[2] For each EER from 0 to 4 we calculated the additional heating energy required compared to an EER of 5. For example, a Canberra property with an EER of 0 requires an additional 459 megajoules/sqm of heating every year to attain the same thermal comfort as an EER5 property.

Adopting the methodology of pitt&sherry[3], we used average floor areas of rental properties and the current retail price of electricity to estimate the annual burden of an average property with an EER below 5. We then drew upon a database of every rental transaction from January 2011 to December 2016, totalling 11,941 disclosed EERs[4], which we generalised to the entire rental housing stock as at the 2016 Census. This allowed us to estimate the energy-efficiency of all ACT rental properties. See Appendix 1 for further details.

Having estimated the burden for each EER and the number of properties with each EER it was possible to express in dollar terms the aggregate market value of the heat energy that renters are missing out on due to energy deficiency.



Results

Our results are summarised in the figure above. They show a sizable burden placed on renters living in the least efficient properties. For an average-sized property with an EER of 0, it would cost $2,800 to produce the same amount of heat that would be free in a property with an EER of 5. To put it another way, renters in such a property are being frozen out of free heat equivalent to running two 2000W electric heaters 24/7 from mid-May to September.

We estimate that the ACT has roughly 24,000 rental properties that would attain an EER lower than 5. With an average household burden of just over $1,600, the total burden borne by all ACT renters living in energy-deficient properties is equivalent to over $39,000,000.

Discussion

Renters live in properties that are 'energy deficient': low energy efficiency means they require more artificial heating to achieve the same thermal comfort found in more efficient dwellings. In effect, energy efficiency pays a dividend in the form of increased thermal comfort, or reduced energy bills, or both. And renters are being frozen out of this dividend.

For some renters, the cost of this denial is monetary and is experienced in higher energy bills. However, many renters have no capacity to increase their energy consumption to compensate for energy deficiency.

These renters spend several months a year living in an environment that is so cold it makes them sick. They pay with their health, both physical and mental.[5] These effects are worse for low-income households[6], or for people with disabilities[7].

In light of these findings, minimum energy efficiency standards must be understood as an urgent intervention to reduce energy costs and improve health outcomes for tens of thousands of members of the Canberra community, many of whom are already experiencing significant disadvantage.

Conclusion

This report estimates the magnitude of the loss experienced by renters who live in energy deficient properties with an EER of less than 5. Given that split-incentives results in lower-quality and less-efficient rental housing stock, this is an attempt to quantify the impact of this outcome on people who rent. The ACT has 24,000 energy-deficient rental properties with an average burden of over $1,600; in total this deprivation has an annual value of $39,000,000.

In response, some renters accept inflated power bills. Others, for whom that isn't an option, are forced to accept an inferior home and the sickness that comes with it. The argument for minimum energy efficiency standards is more than just environmental; for people who rent it has implications for household budgets, health, and quality of life at home.

Bibliography

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Appendix 1

Burden was calculated according to the following equation:

$$B = \sum_{i=0}^{i=4} (E_i - E_5)\, C \cdot P \cdot F_i \cdot N_R \cdot A$$

Where:

- B is the estimated burden in dollars due to energy deficiency,
- E_i is the heating energy requirement in MJ/sqm corresponding to each EER,
- C is a conversion factor to convert from MJ to kWh (1/3.6),
- P is the price of electricity (25.036c/kWh from 1 July 2018 on ActewAGL's 'Home' plan),
- F_i is the estimated proportion of rental properties for each EER, and
- N_R is the number of rental properties in the ACT as measured in the 2016 Census (45,320).

Note that F_i was extrapolated: properties with disclosed EERs were used as a sample to infer energy efficiency of all properties. This is very likely to overestimate the energy efficiency of properties: as properties with low energy efficiency are more likely not to disclose an EER †, disclosed EERs paint a rosier picture than is likely the case.

A is a weighted average floor size calculated as follows:

$$A = \sum_{B=1}^{B=5} \frac{A_B N_B}{N_R}$$

Where A_B is an estimated floor area corresponding to a particular quantity of bedrooms and N_B is the number of rental properties with that number of bedrooms as reported in the 2016 Census. These values are averaged across all rental properties (N_R) to obtain a weighted average floor area of 85 sqm. Rental properties with one to five bedrooms account for 98.7% of all rental properties.

† see Fuerst F & G Warren-Myers, above; also Lee, T, & Y Wang, 'Mandatory Disclosure of Energy Efficiency for Residences – History and Compliance in the A.C.T. Sales and Rental Markets'. 2010, 1–17.