Thesis abstract

Essays on household energy poverty and Australia's renewable energy transition

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Abstract of a thesis submitted to the Australian National University[1]

Rooftop solar photovoltaics (PV) and household energy efficiency are becoming increasingly important ways to shield households from high energy prices and reduce emissions. However, some households, predominantly those on low incomes and who rent their homes, are at risk of being left behind. This thesis explores (1) how energy poverty and differences in access to residential energy technologies can be addressed and (2) the impacts of such access on household energy consumption and wellbeing. It finds that Australian households with access to rooftop solar PV systems experience large reductions in their likelihood of experiencing objective forms of energy poverty based on comparisons of energy expenditures and incomes. Those with new energy-efficient reverse cycle air-conditioners (RCACs) and hot water systems benefit from reduced energy bills and lowered carbon footprints.

Moreover, public housing tenants in the Australian Capital Territory (ACT) with access to new RCACs report improvements in their health and greater satisfaction with their homes during summer, although there is no statistically significant impact for energy bills stress. A survey of rental providers finds that the key barriers to investment in rooftop solar PV for rental properties are affordability and a belief that renters are unwilling to pay higher rents for the technology. Policies targeted at spreading solar system payments over time or distributing feed-in tariffs to rental providers are found to be not preferred by most rental providers. This thesis collects primary data through three surveys and uses a variety of econometric methods, from discrete choice analysis to instrumental variable regressions and fixed effects panel data regressions. The insights are able to inform future policies on household access to energy innovations, especially for vulnerable cohorts.

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