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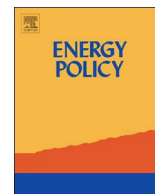
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Identifying policy solutions for improving the energy efficiency of rental properties



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ABSTRACT

World leaders have acknowledged that climate change is one of the biggest challenges we face in the 21st century and have committed to pursuing efforts to limit warming to 1.5 degrees above pre-industrial levels (UNFCCC, 2015). To do this, further efficiencies in energy use are needed across all sectors, many of which still offer considerable potential for improving energy efficiency. Rental properties in particular, have seen very few improvements in energy efficiency due to a range of barriers and market failures including misinformation, split incentives and an uneven power dynamic between renters and landlords. This is important as not only do rental properties account for a significant proportion of housing stock, the high proportion of low income households in rental properties are particularly vulnerable to rising energy prices. This study aimed to identify feasible policy solutions for overcoming the barriers to energy efficiency improvements in rental properties. Renters, landlords and agents were presented with five possible solutions to determine their level of support. Eight key recommendations for overcoming the barriers to energy efficiency improvements in rental properties are provided. These create a foundation for policy makers, councils and businesses to develop and target energy efficiency solutions for rental properties.

1. Introduction

In 2015, 195 world leaders at the Paris Climate Change Conference adopted the Paris Accord which recognised “that climate change represents an urgent and potentially irreversible threat to human societies and the planet and thus requires the widest possible cooperation by all countries, and their participation in an effective and appropriate international response, with a view to accelerating the reduction of global greenhouse gas emissions” (UNFCCC, 2015, p 1). World leaders at the Paris Accord also committed to pursuing efforts to limit warming to within 1.5 degrees of pre-industrial levels (UNFCCC, 2015). The global community therefore faces the ongoing challenge of meeting future energy needs and maintaining current qualities of life, while reducing greenhouse gas (GHG) emissions produced by human activity.

Improving energy efficiency is a key to mitigating climate change (EEC, 2016). However, despite the proven benefits of energy efficiency there is a significant gap in the uptake of energy efficiency improvements, particularly in rental situations (de T'Serclaes and Jollands, 2007). In Australia, rental properties represent 25% of the property market (DSE, 2009). The low uptake of energy efficiency improvements in the private rental sector not only undermines Australia and

Victoria's attempts to reduce GHG emissions, it jeopardises equitable access to energy for low income households.

A review of the literature on the barriers to energy efficiency improvements in rental properties, internationally and in Australia, confirms that there are several market failures occurring in the Victorian private rental market. Australian empirical studies reveal that these market failures are exacerbated in Victoria by low vacancy rates, short term rental leases, and a fiscal and regulatory system that preferences landlords. There is a significant gap in the literature however, of empirical research into possible solutions to overcoming the barriers to energy efficiency improvements in rental properties.

This is the first study in Victoria to test solutions to overcoming the barriers to energy efficiency improvements with a sample of landlords, renters and real estate agents. The aim of the study is to identify the most feasible solutions to overcoming the barriers to energy efficiency improvements.

2. Background

2.1. The energy efficiency gap

Despite a slowdown in residential sector energy consumption

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(BREE, 2014), researchers agree that there is a ‘gap’ between the potential energy savings offered by energy efficient technology and the savings that are realised (Allcott and Greenstone, and de T'Serclaes and Jollands, 2012, 2007).

The Victorian Department of Sustainability and Environment (DSE) (2009) conducted research into the energy performance of rental properties in Victoria. A combination of home audits and analysis of utility company data indicated that twice as many rental households used electric heating compared to owner occupied, 15–30% of rental properties have poor or no insulation and 52% of rental households report difficulties heating their homes (DSE, 2009). The DSE found that these proportions were all higher than owner occupied dwellings and concluded there is an energy efficiency gap in rental properties in Victoria.

Residential buildings are responsible for 11% of Australia's total energy consumption (BREE, 2014), and nine percent of total GHG emissions (ABS, 2008). Private and public rental properties make up approximately 25% of Victoria's housing stock (DSE, 2009). Barriers to energy efficiency improvements in rental dwellings therefore have a substantial negative impact on Victoria and Australia's attempts to reduce emissions and mitigate climate change. In 2007, de T'Serclaes & Jollands attempted to quantify the amount of energy not saved due to barriers to energy efficiency in rental situations worldwide. They estimated that each year over 3800 PJ of potential savings, equivalent to roughly 85% of Spain's total energy use, were lost (de T'Serclaes and Jollands, 2007).

It is important to acknowledge concern over a possible efficiency ‘rebound effect’ that could counteract the gains made by energy efficiency measures. The United Nations Department of Economic and Social Affairs (UNESA, 2007) explains the ‘rebound effect’ as an increase in energy consumption enabled by monetary savings resulting from increased energy efficiency. For example, money saved on household electricity bills could be made available for purchasing more household appliances. According to UNESA, studies have shown that the ‘rebound effect’ exists, but the scale of it depends on a variety of factors. Greening et al. (2000) conducted a review of all the studies into the ‘rebound effect’ and concluded it was not significant enough to undermine the importance of energy efficiency to mitigating climate change. The ‘rebound effect’ therefore does not undermine the significance of this study, but it does highlight the importance of incorporating energy efficiency into all areas of energy production and consumption.

2.2. Energy efficiency and low income renters

The close relationship between lower incomes and higher rates of renting has been a long term trend in Australia (ABS, 2013). However, Stone et al. (2013) and the ABS (2013) found that there has been an increase of long term renters and lone parent households with dependent children in the private rental market over the last two decades. “Overall rates of housing stress [also] increased among private renters from 1981 to 2011” (Stone et al., 2013, p2) with more than 20% of long term renters regularly paying more than half their income on rent (Stone et al., 2013).

Twenty three percent of all private renters in Australia are on government pensions or allowances, and 18% of private renters have no capacity to raise \$3000 in an emergency (Stone et al., 2013). The relationship between lower incomes and the private rental market reveals that improving the energy efficiency of rental properties would not only reduce GHG emissions, but could also reduce economic stress for low income households.

Energy costs in Australia have increased significantly in the last decade. The average household electricity bill increased 83% between 2007 and 2013 (Chester, 2013). Approximately 28% of Australian private rental households suffer utility stress (Sullivan, 2007), and “electricity and gas bills [were] the greatest cause of rental arrears

(63%) in Victorian low income households” (Chester, 2013, p 7).

The terms ‘energy equity’ and ‘fuel poverty’ have been increasingly discussed by many academics in reference to low income households and energy prices. Zipprich et al. (2010, p7) define energy equity as “the consideration of fairness when dealing with energy”. Fuel poverty, where households pay more than 10% of their income on energy bills to adequately heat and cool their homes, has been documented in Europe, the UK and New Zealand. Strong correlations were found between fuel poverty and winter mortality (Chester, 2013). According to Zipprich et al. (2010) there is a universally recognised relationship between poverty alleviation and access to energy. There is also increasing recognition of the relationship between energy access and health. A study conducted in New Zealand by Howden-Chapman et al. (2007) on the relationship between adequate heating and health, found quantitative and qualitative evidence that insulating houses reduced the rates of respiratory diseases, days off work, winter colds and flus and asthma wheezing.

As energy prices continue to rise, disparity is occurring between those who can afford to improve the energy efficiency of their property and those who cannot. Paradoxically, those who are most vulnerable to price increases are the people with the least capacity to improve the energy efficiency of their property. Therefore, the concept of energy equity should be a consideration for any proposed solutions aimed at addressing the energy efficiency gap in the private rental market. This may be more challenging in some contexts where cultural commitment to markets is extremely strong.

2.3. What are the barriers to improving energy efficiency in rental properties?

Research has revealed a broad range of factors that act as barriers to energy efficiency improvements both universally and particularly to the Australian and Victorian context. Relevant universal theory and Australian empirical studies are discussed below.

2.3.1. Theoretical perspectives

de T'Serclaes and Jollands (2007) identified a range of market barriers and failures that inhibit energy efficiency improvements. Market barriers are circumstances that discourage entry into a market, while market failures occur when “one or more of the conditions necessary for markets to operate efficiently are not met” (de T'Serclaes and Jollands, 2007, p 24). Fig. 1 separates the obstacles to energy efficiency improvements into market barriers and market failures.

Ungar et al. (2012) name imperfect information as the most

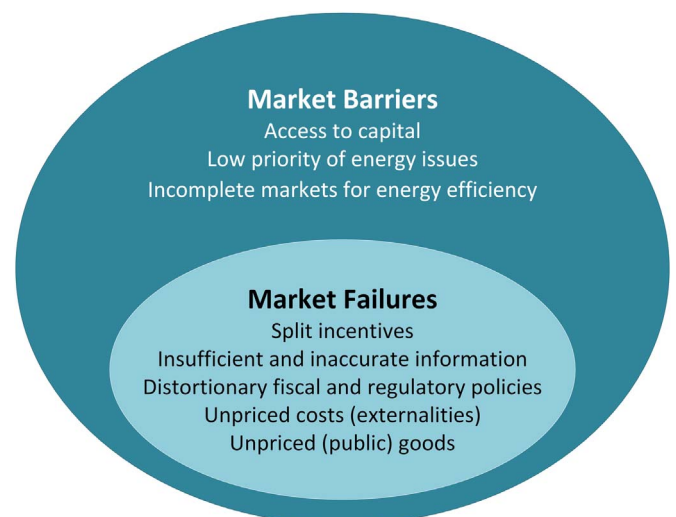


Fig. 1. Market barriers and market failures inhibiting energy efficiency (de T'Serclaes and Jollands, 2007).

prominent barrier to energy efficiency improvements. Examples of imperfect information include limited knowledge of the energy performance of different equipment, unpriced health and environmental costs of fuel types, energy savings being difficult to measure, uncertain future energy prices and that specific energy uses are not quantified in utility bills. *de T'Serclaes and Jollands (2007)* categorise imperfect information as a market failure because consumers do not have enough information to make the most rational choice. *Burfurd et al. (2012)*, however, believe their research “highlights that market failures in rental markets are more complicated than a simple information problem”. They point out that most of the literature on energy efficiency barriers in rental properties focuses on the split incentives between landlords and renters (*Burfurd et al., 2012*).

Williams (2008) and *de T'Serclaes and Jollands (2007)* agree that the split incentives between landlord and renter are a classic example of the Principle Agent (PA) problem. *de T'Serclaes & Jollands* define PA problems as “potential difficulties that arise when two parties engaged in a contract have different goals and different levels of information” (*de T'Serclaes and Jollands, 2007*, p 27). According to this theory, the result is adverse selection and moral hazard. For example, a renter choosing a property with poor thermal performance (adverse selection), and a landlord acting opportunistically by purchasing the cheapest appliances that cost the renters more to run (moral hazard) (*de T'Serclaes and Jollands, 2007*). *Sorrell et al. (2004)* criticise the PA theory as reductionist and argue it does not hold true in complex world scenarios. Australian studies support the existence of split incentives but also expose a range of externalities which exacerbate the market failure.

2.3.2. Australian studies

This review of the relevant literature found nine empirical studies investigating the barriers to energy efficiency improvements in Australian private rental properties. Discussion of split incentives was mixed. *Gabriel and Watson (2010)*, in their investigation of the Environmental Sustainability of Australia's Private Rental Stock, concluded that split incentives are not “particularly significant” when understanding differences in energy use between rental and owner occupied homes. The Tenants Union of Victoria told *Dillion et al. (2010)* in their evaluation report for Just Change that split incentives exist and were entrenched by inadequate information and “resistance to changing habits” (*Dillion et al., 2010*, p 3). The Clean Energy Council affirmatively believes that the issue of split incentives exists for self-generation by solar PV in rental properties (*AER, 2013*). *Geradi's (2014)* review of studies into the Victorian Energy Efficiency Target (VEET) fundamentally disagrees on the presence of split incentives in Australia. The other studies, while not explicitly naming the split incentive problem, do find a wide range of barriers to energy efficiency improvements that can be viewed through a theoretical lens as market failures and split incentives.

Strempe et al. (2010) interviewed and surveyed landlords, renters and agents and found that “demand for environmental upgrading or improved performance is dramatically under expressed by renters” (*Strempe et al., 2010*, p 6). *Strempe et al. (2010)* believe this stems from fear of eviction amongst renters. The Just Change report also found “most, if not all, renters displayed some degree of anxiety about the relationship with their property managers or landlord” (*Dillion et al., 2010*, p 8). This mistrust results in misinformation about the energy performance and thermal comfort of rental properties, and can therefore be classified as a market failure (*de T'Serclaes and Jollands, 2007*).

Further investigation into the causes of this fear reveals another market failure: distortionary fiscal and regulatory policies. According to *Sullivan (2007)*, renters in Victoria experience limited security of tenure, with short term rental leases and limited rights to make changes to properties. The Victorian Residential Tenancies Act requires renters to ‘make good’ properties at the end of their lease. This means

even willing renters are discouraged from improving properties themselves, or asking for permission to engage in energy efficiency programmes offered by external parties (*Dillion et al., 2010*).

Fear of eviction is fuelled by very low vacancy rates in many Australian cities, particularly inner Melbourne where the vacancy rate is under one percent (*DSE, 2009*). According to *Williams (2008, p17)*, “vacancy rates can have a critical impact on the balance of power between renters and landlord and therefore upon the renters’ ability to demand energy efficiency”. Vacancy rates of under five percent exacerbate the split incentive problem because owners are under little pressure to improve rental properties and renters know that if they demand improvements they can be easily replaced.

Sullivan (2007) points out that the current tax system in Australia also provides greater assistance to established home owners and investors than to renters, exacerbating the power dynamic. There is a large pool of funding available in Australia to support energy efficiency activities in households according to *Dillion et al. (2010)*. *Riedy et al. (2004)*, *Strempe et al. (2010)* and *Chester (2013)* all agree however that existing rebates, grants and other schemes are complicated and time consuming which has inhibited their uptake.

The strongest evidence of split incentives was found between renter and agent. Two thirds of rental properties in Australia are managed by a real estate agent (*DSE, 2009*). *Strempe et al. (2010)* found that properties managed by agents had significantly less energy efficiency upgrading. This is because agents “acted as ‘gate keepers’, deciding which types of requests and complaints will be passed onto landlords and sometimes actively discouraging landlords from undertaking what they consider to be unnecessary works e.g. those that are not required by law” (*Strempe et al., 2010*, p 8). It was also found that agents had very low levels of knowledge about energy efficiency (*Strempe et al., 2010*).

Finally, another significant market barrier identified by previous studies was access to financial capital for both renters and landlords. *Strempe et al. (2010)* found that the increasing instances of investors entering the rental property market through overleveraging and inheritance results in landlords without “sufficient disposable capital to respond to problems as they arise” (*Strempe et al., 2010*, p 10). *Johnson and Sullivan (2012)* also found lack of capital a substantial barrier for renters engaging with the Victorian Energy Efficiency Target (VEET).

2.3.3. Renters and the Victorian energy efficiency target

The VEET is “the largest residential greenhouse gas emissions reduction scheme in Victoria” (*Johnson and Sullivan, 2012*, p 5). Energy retailers are required to produce Victorian Energy Efficiency Certificates (VEEC) to demonstrate that they have made reductions in GHG emissions. Every certificate represents one tonne of GHG emissions saved. Retailers earn these certificates by providing energy efficient products to households free of charge or at a discounted rate. Certificates can be bought or sold by registered businesses and energy retailers (*DEDJTR, 2015*).

The following set of graphs in *Fig. 2* shows the number of VEECs issued by income level for a range of product upgrade schemes under the VEET. A higher number of VEECs represents a higher uptake of a particular product. This illustrates how low income households were much more likely to engage in free energy efficiency schemes than those that required financial contribution. This is significant because according to the ABS Income and Housing survey (*Stone et al., 2013*), in 2008, 34% of private renters were in the lowest two income quintiles, and therefore would have had less opportunity to benefit from the VEET than owner occupied households.

2.4. How can the barriers to energy efficiency in private rental properties be addressed?

The literature reviewed contains suggestions for possible policies or

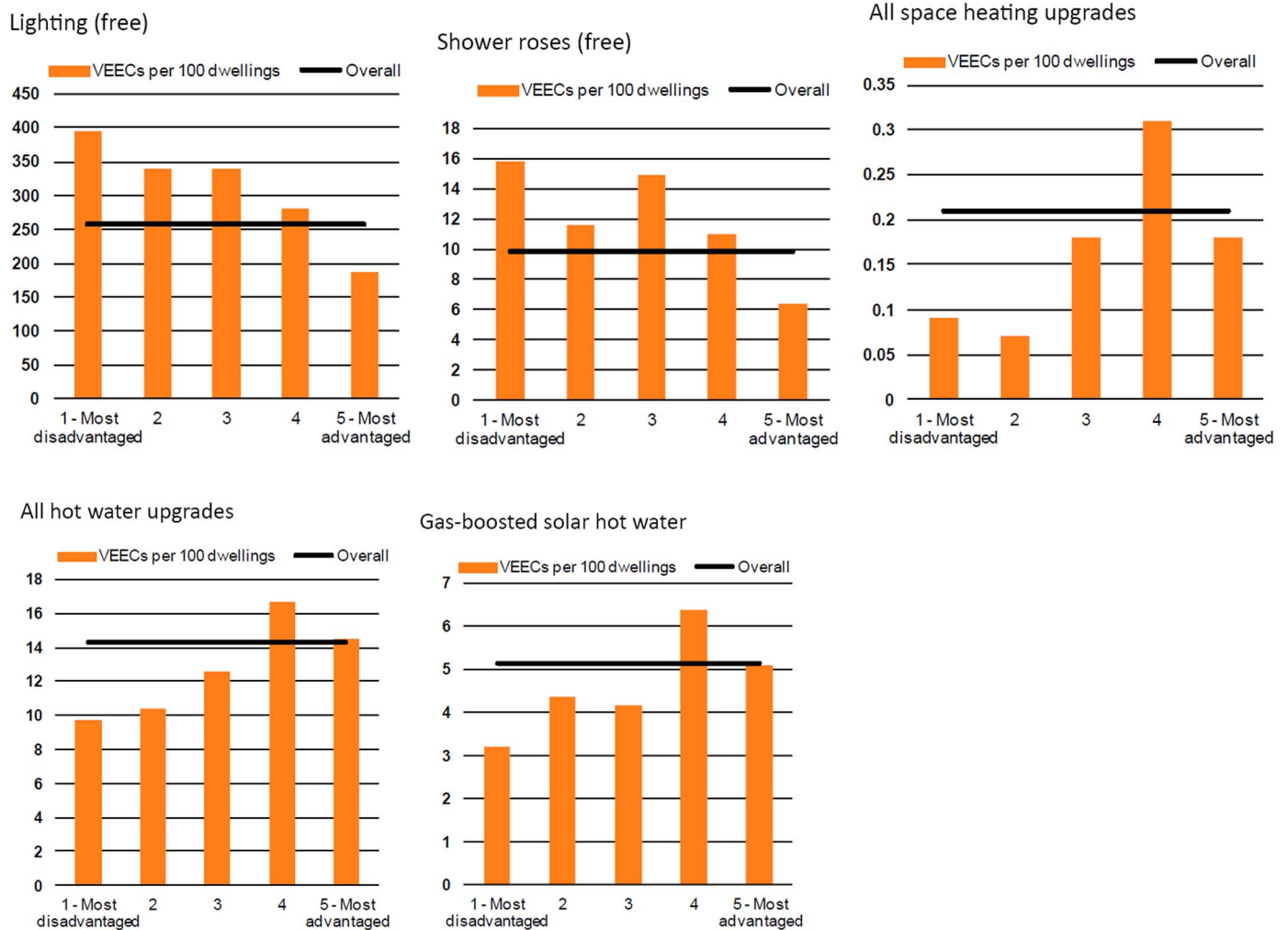


Fig. 2. Distribution of Victorian Energy Efficiency Certificates by improvement type (Johnson and Sullivan, 2012).

scenarios that could overcome the barriers to energy efficiency improvements in rental properties. However, there is a gap in the literature of any evidence based studies into what solutions would improve the energy efficiency of rental properties in Victoria and be supported by landlords, renters and agents. This research aims to fill this gap and contribute to the shift towards a more equitable, informed and successful energy efficient market for rental properties.

In a review of energy efficiency policies worldwide, [de T'Serclaes \(2007\)](#) found that no one policy will sufficiently address all the barriers. Instead a well-targeted package of solutions is required. [Bird and Hernandez \(2012\)](#) believe incentives must accrue to both the landlord and the renters, and others agree, stating policy is needed “to align the goals of landlords and renters” ([de T'Serclaes and Jollands, 2007](#), p 29). [Strempe et al. \(2010\)](#) add that policies targeting landlords at the point of tenancy change overs may overcome landlord reluctance. The low uptake of no interest loans by low income households leads [Sullivan \(2007\)](#) to suggest that tax incentives targeted at landlords would be more successful.

Finally all the authors reviewed here agree that minimum energy efficiency standards would effectively circumvent many of the barriers to energy efficiency improvements. They disagree however, on whether the standard should be voluntary or mandatory. [Gabriel and Watson \(2010\)](#) believe that mandatory standards would negatively affect low income renters because rental prices would jump significantly to cover the costs. [Riedy et al. \(2004\)](#) counter argue that in the Victorian context, with vacancy rates so low and a market geared towards generating profits for investors, there would be little incentive to meet

voluntary standards. [Burford et al. \(2012\)](#) suggest mandatory information programs and voluntary standards. This research hoped to identify under what conditions solutions suggested in the literature would be most effective.

3. Research method

The aim of this research was to identify the most feasible solutions to overcoming the barriers to energy efficiency improvements in Victorian rental properties. To do this, five possible solutions were tested with a sample of landlords, renters and real estate agents.

Recognising the difficulties of sourcing solutions from a population with insufficient knowledge of energy markets and efficiency, it was decided to instead test several solutions that have been suggested by experts or trialled in other countries (participants were however always given the opportunity to put forward their own suggestions). Given their complex nature, the solutions are presented as scenarios (outlined in [Table 1](#)) that illustrate the intended effect and interaction between stakeholders, rather than the exact policy, law or contract that would be implemented.

A mixed method research design was applied to gauge the reactions, attitudes and support of landlords, renters and real estate agents towards the suggested solutions.

The key challenge to engaging landlords and renters is that they are geographically dispersed; there is no location you can go to access renters and landlords as you could with customers in a shopping centre. Previous studies in Australia have also revealed that landlords

Table 1
List of policy solutions for improving the energy efficiency of rental properties.

Solution	Description	Source
1	Amending the Residential Tenancies Act to allow renters greater rights to improve rental properties.	Tenants Union of Victoria, Dillon et al. (2010), Stremmel et al. (2010)
2	Classifying energy efficiency improvements as 'repairs' in the rental properties tax classifications so landlords can tax offset the entire cost of the improvement in the same financial year.	Moreland Energy Foundation, Williams (2008)
3	A residential 'Green Lease'- Landlords recouping the cost of energy efficiency improvements by increasing the rent for a fixed period e.g. 80% of the cost the renter saves.	Williams (2008), Blundell (2013)
4	Pay as you save system - no upfront costs for the improvement and the contract can be transferred to new renters or owners.	Williams (2008), Gemenergy Solar (2014)
5	Mandatory minimum energy efficiency standards for rental properties.	Riedy et al. (2004), Dillon et al. (2010), Stremmel et al. (2010)

are less likely to partake in studies due to time constraints and concerns over accountability (Dillon et al., 2010).

Web surveys are an effective tool for reaching large numbers of people in any location, cost effectively, while protecting the anonymity of the subject and ensuring standardisation of questions (Couper, 2000). Surveys typically produce quantitative results, but can also be used in a qualitative manner to measure "individual's ideas, perceptions and attitudes" (Farenga et al., 2010, p 13) through open-ended questions. For these reasons a web survey was chosen to engage both landlords and renters under the same conditions.

Finally, although landlords and renters are the core stakeholders in energy efficiency improvements for rental properties, real estate agents manage two thirds of rental properties in Australia (DSE, 2009) and therefore play a critical role in the rental market. Semi-structured interviews (30 – 40 min) were conducted with a small sample of five agents to provide a triangulated view of the perceptions, attitudes and viability of the solutions.

3.1. Data collection

A snowball sampling technique (Patton, 1990) was adopted to disseminate the survey. Individuals and groups were contacted via social media, email and phone, and asked to support the research by sharing the survey with supporters, friends and family. Attempts were made to bridge geographical and political divides such as contacting all 79 Victorian councils, 125 Victorian State Members of Parliament (MPs) and 29 Victorian Federal MPs.

Altogether 230 people responded to the survey, 194 renters and 36 landlords. This is a representative sample of the 1.49¹ million renter/landlord population size, for a confidence interval of 6% and confidence level of 95% (NSS, 2016). In Australia, on average, there is one landlord for every three renters (Collyer, 2011). There were approximately five renters that responded for every landlord, giving the survey a slight bias towards renters. It should also be noted that due to the relatively small number of landlords surveyed, the findings from this group should not be considered statistically significant on their own.

Agents were approached by phoning and emailing real estate agencies. Five agents were interviewed from two real estate agencies. All five of the agents managed residential rental properties in inner Melbourne. The agents interviewed consented to being recorded and the interview was then transcribed.

¹ The 2011 ABS statistics indicated that at the time, there were 435,178 privately rented dwellings in Victoria (ABS, 2013). Given that the average household size in Australia is 2.6 people (ABS, 2013) the overall number of renters in Victoria can be estimated at just over 1 million. In their Laying the Groundwork consultation paper Consumer Affairs Victoria estimated the number of landlords in Victoria using 2011 ABS data was 358,900 (CAV, 2015). This makes the estimated total number of private renters and landlords to 1,490,363.

3.2. Data analysis

The mixed method research approach required both quantitative and qualitative analysis. The quantitative responses to the scenario questions, which were answered along a Likert Scale, were split up into landlords and renters. For the sake of comparison the numbers were converted into proportions of each stakeholder group. The proportions were then represented as a diverging stacked bar chart, which according to Robbins and Heiberger (2011) is the best graph for "compar[ing] the attitudes of respondents in different demographic categories" (Robbins and Heiberger, 2011, p 1060).

Respondents provided 365 qualitative comments throughout the survey. These comments and the transcripts of the interviews with agents were analysed using thematic coding. The codes were inductive codes; codes derived from the comments provided. Inductive coding was chosen because as far as this research indicates, there is no previous empirical research investigating the particular solutions being tested in this study, and therefore responses cannot be predetermined. The codes were kept consistent across all the questions and stakeholders so that responses and/or attitudes that were not only common to each scenario but across the research, could be identified.

When asked about the main reasons why they hadn't, or motivations for why that had, made energy efficiency improvements, there was a chance for respondents to select conflicting responses. For example, they may have chosen 'You are not interested in reducing greenhouse gas emissions' as a reason why they hadn't made improvements but also selected 'You were concerned about reducing greenhouse gas emissions' as a motivation for why they did make improvements. For this reason, internal consistency was analysed to test the reliability of the survey results. An α equal to 0.9 was found for the survey results, indicating an excellent internal consistency.

3.3. Limitations

There were some limitations to this study, including a small sample of landlords, a bias towards respondents with a greater concern for reducing GHG emissions, and a limited geographical scope. Everything was done to avoid and reduce the effect of these limitations but factors including time restrictions and limited monetary resources restricted the capacity for this research to reach more than 230 people. It is recommended that for future research more landlords and real estate agents be engaged (including from rural areas), government stakeholders be included, information on different locations be recorded and further attempts at overcoming the sustainability bias be made.

4. Results

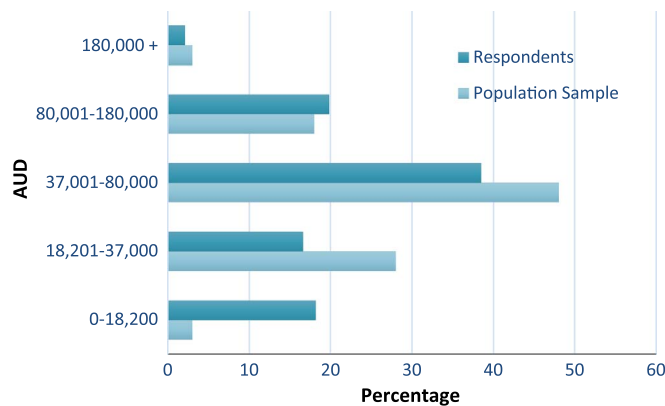
The results are separated into landlord and renter's responses to give a more accurate reflection of the support for solutions by each group.

There were respondents that lived in or owned every type of

Table 2

Length of time renter has lived in current rental property.

Time in rental property	Proportion of respondents (renters)
1 year or less	53%
> 1 – 3 years	32%
> 3 – 5 years	10%
6 – 9 years	3%
10 + years	3%

**Fig. 3.** Income brackets of respondents and the general Australian population (ATO, 2012).

housing; detached (42%), semi-detached (18%), two storey townhouse (11.5%), medium rise apartment 3–10 storeys (23%), and high rise apartment 11+ storeys (2%). Over half of the respondents that were renters had lived in their current rental property for a year or less, and very few had lived in their current property for longer than five years (Table 2).

The distribution of respondents by income bracket was biased towards lower incomes, in comparison to the income distribution of the broader Australian population (Fig. 3). However, this is to be expected because there is a close relationship between lower incomes and higher rates of renting in Australia (ABS, 2013). Landlords as a whole also earned more than renters, with the most common income bracket for landlords being \$80,000 – \$180,000 per annum (35%), and for renters \$37,000 – \$80,000 per annum (35%). There was however, renters and landlords represented in every income bracket with 16% of landlords earning less than \$37,000 and 13% of renters earning greater than \$80,000 annually.

4.1. The main motivations and barriers for Victorian landlords and renters making energy efficiency improvements

The results of this study support the findings of previous studies with all of the aforementioned barriers discussed in the background. Cost and lack of rights were the two biggest barriers listed in the quantitative results (Fig. 4). However, the qualitative information revealed for many respondents it was not the cost alone that was the barrier, but the lack of assurance that renters would see return for their investment due to short insecure leases. This is a distortionary regulatory policy and therefore a market failure (de T'Serclaes and Jollands, 2007).

There were a lot of contradicting comments on the question of what improvements renters can and can't make to a rental property. The agents interviewed were adamant that renters could make any changes they wanted with permission from the landlord, and landlords believed they should be asked before potential improvements are made. In contrast, renters not only indicated that agents and landlords had discouraged them from making improvements, but 82% of the renters who had made improvements made them without permission from the

landlord. This misinformation and mistrust aligns with the Principle Agent Theory, whereby two parties in a contract have different goals and different levels of information, (de T'Serclaes and Jollands, 2007), more commonly described as split incentives. The presence of this market failure creates a case for more education and awareness about what energy efficiency improvements can be made to rental properties.

In addition to barriers, the study also asked what the main motivations were for landlords and renters who made energy efficiency improvements (Fig. 5). There were a range of factors that motivated landlords and renters; the average number of motivations listed for both stakeholders was four, and the maximum listed was 11. The most consistent motivations cited was a desire to reduce gas, water and electricity bills, conserve water and reduce GHG emissions, and to improve the heating, cooling and comfort of the property. Other common motivators cited were that energy efficiency improvements are a smart investment and it made the respondent feel good. Landlords listed government schemes as motivators more often, which is unsurprising given they are eligible for more schemes than renters.

The finding that renters and landlords are motivated by multiple factors is evidence that any promotion of energy efficiency improvements (technology, schemes or policy), should always provide information on the broad range of benefits associated with the improvement.

4.2. Responses and reactions to the proposed solutions from landlords, renters and real estate agents

Fig. 6 presents the responses along a Likert Scale to the question for each solution 'I would support...'. The quantitative responses in this figure were analysed along with the qualitative responses to each solution, which ranged from 24 to 57 comments per solution.

No consensus emerged in the literature as to what constitutes an adequate level of 'support' for a policy or financial solution. A nuanced approach was applied to the analysis of levels of support for the solutions that considered the qualitative responses, took into account the number of 'unsure' answers and placed a high value on the proportion of respondents who outright disagreed.

Of the five solutions put forward two of them were clearly supported by all three stakeholders. They are:

- Solution 2 - Classifying energy efficiency improvements as 'repairs' in the rental properties tax classifications so landlords can tax offset the entire cost of the improvement in the same financial year.
- Solution 5 - Mandatory minimum energy efficiency standards for rental properties.

Solution 2 had the greatest level of support - over 90% support from both landlords and renters, less than 7% unsure and only one renter who disagreed with the solution. Real estate agents were also convinced that the solution would be effective, with no negative repercussions for the renter. The only concern expressed in the qualitative data was whether the single incentive was enough to encourage landlords to make energy efficiency improvements. It was suggested that Solution 2 would work well with Solution 5.

Solution 5, a mandatory energy efficiency standard, was the next most supported - over 90% of renters and over 70% of landlords supported it. A total of 10% of landlords did not support the solution and 19% were unsure. However, the number of landlords who strongly disagreed reduced if the mandatory standard was combined with other solutions, such as tax offsetting energy efficiency improvements (Solution 2). Agents agreed that this solution could be effective and provided some additional ideas for financial incentives. The biggest concern raised in the comments was whether having a minimum energy efficiency standard would result in rent increases unfairly disadvantaging low income renters. If this solution was to be implemented, the qualitative responses suggest a lead time of less than five years, phasing in the minimum standard and putting in place protec-

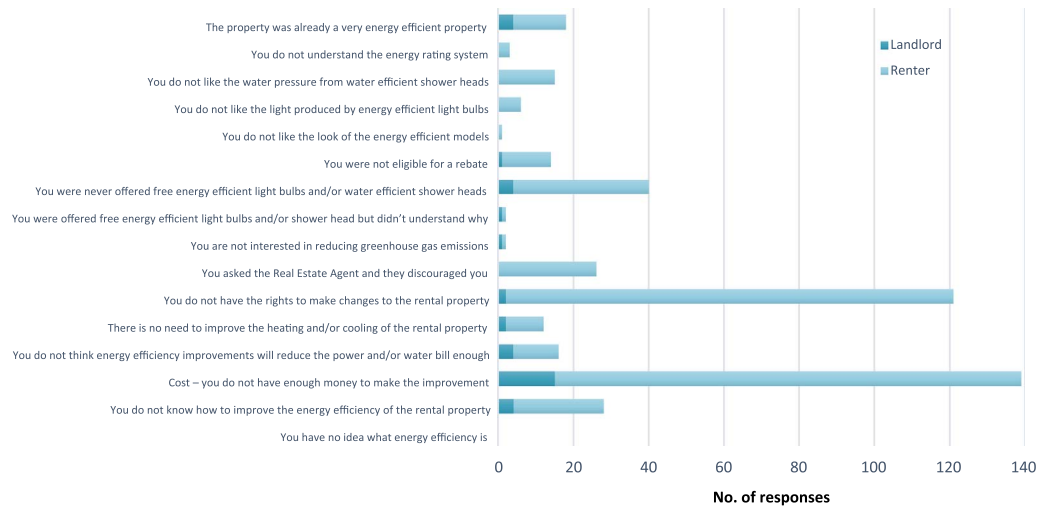


Fig. 4. Barriers to energy efficiency improvements in rental properties.

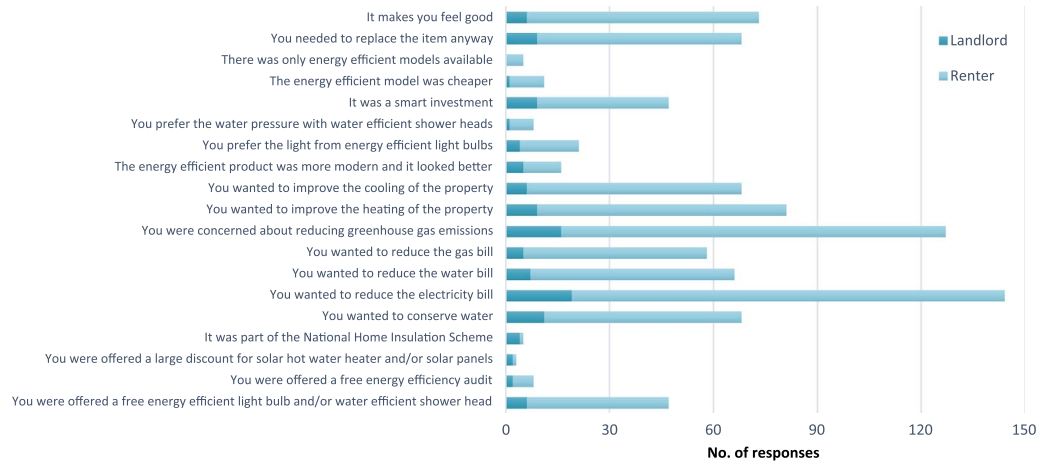


Fig. 5. Motivations for making energy efficiency improvements.

tive mechanisms against unfair rent increases. Solutions 1 and 3² were not sufficiently supported by all stakeholders. More than 15% of respondents disagreed with the solutions, a high number of respondents were ‘unsure’, there was little support from agents and strong consistent negative reactions in the comments.

Solution 4, a pay as you save system for improvements where renters use energy savings to pay off the loan, received a reasonable degree of support. Over 58% of landlords and renters agreed that the solution could result in increased energy efficiency improvements and no more than 13% disagreed. However, there was a high number of

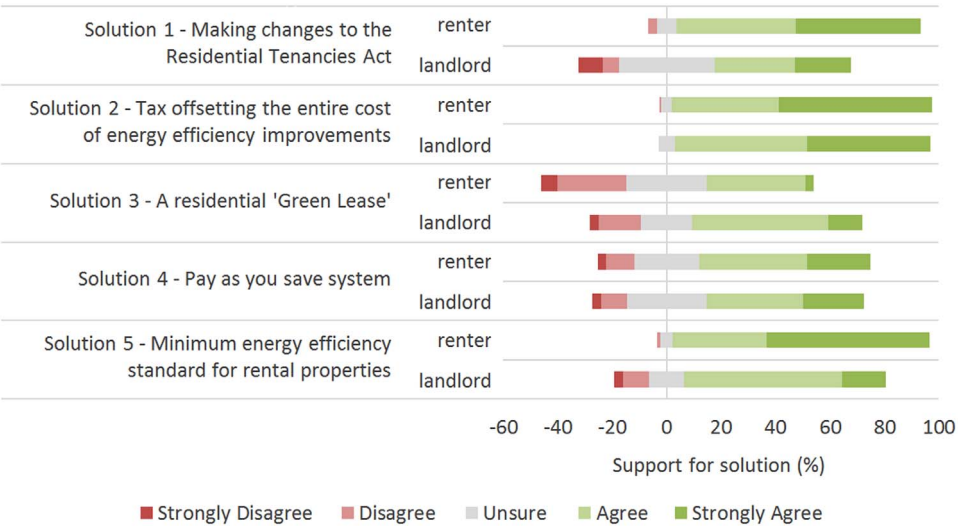


Fig. 6. Support for the suggested policy solutions.

respondents unsure about the solution and there were mixed reactions in the comments and from agents. For this solution to gain greater support it would need more clarity around the nature of the contracts.

The real estate agents interviewed drew attention to a solution that some renters already use to improve their rental properties. Every year at the end of a lease the real estate agent will often try to negotiate a rent increase on behalf of the landlord. In their experience, several renters have negotiated to accept the rent increase if the landlord makes an improvement for example, installing an air-conditioner. The idea is that the cost of the air-conditioner is roughly equivalent to or less than one month of lost rent due to re-advertising. Usually the landlord is happy to agree because they will make money back from the rent increase through the year and benefit from the improved capital value of the property. In addition to the solution proposed and discussed in this study, this solution is considered feasible because there is anecdotal evidence that landlords, renters and real estate agents support it.

Finally, landlords, renters and real estate agents all agreed that there is a need for greater government involvement, both in setting standards for energy efficiency in rental properties and rewarding energy efficiency improvements.

5. Discussion and Conclusion

A discussed in the research method, the proposed solutions to overcoming the barriers to energy efficiency improvements in rental properties were presented as scenarios describing the interaction between stakeholders not an exact policy or strategy. Given the level of support for many of the solutions with two in particular deemed feasible, it is important to discuss how they would be implemented and what additional barriers might arise.

The implementation of Solution 2, tax offsetting the entire cost of energy efficiency improvements in the same financial year, would require a change to national tax law, the Income Tax Assessment Act 1997 (ATO, 2015). This could happen through either a tax amendment bill which would need to be passed through both Federal Houses of Parliament, or via a Public Ruling by the Commissioner of Taxation (Scolaro, 2006). Currently, the most significant national policy in regards to energy efficiency in residential properties is the Council of Australian Governments National Strategy on Energy Efficiency (COAG, 2008). Despite all the states and territories signing the Strategy, many of the agreed measures and policies have not come to fruition, such as a mandatory disclosure of energy and water performance for all residential properties and a phase out of electric hot water systems (VicGov, 2015). Given the current lack of political will for national energy efficiency policy Solution 2 is ambitious, but the likelihood of the change occurring would increase with national public support. This makes the case for further research testing Solution 2 with a wider Australian audience.

If Solution 5, a mandatory energy efficiency standard, were to be implemented it would also increase the likelihood of Solution 2 being implemented (ATO, 2015). Currently anything classed as 'repairs' are entirely deductible against a landlord's income in the same financial year. Expenditure required to make a property satisfy regulatory requirements falls into the 'repairs' classification (ATO, 2015).

Rental standards are managed by state governments, therefore to implement Solution 5 a bill would be required to pass through the Parliament. However, there are currently no minimum standards for rental properties, energy efficiency or otherwise, and an attempt by the Australian Greens Party in 2013 to pass minimum requirements failed to pass through the parliament (Greens, 2014). The support for this

solution by all the stakeholders in this study presents a case for the implementation of a minimum energy efficiency standard to be revisited by policy makers.

Solution 4, a pay as you save system, would not require any legislative changes and could be implemented by business, local or state government (Williams, 2008 & Gemenergy Solar, 2014).

A consistent theme that arose throughout this study was that renters could not afford rent increases to cover the cost of energy efficiency improvements. This fear is not unfounded. An annual study conducted by Anglicare Australia found that in Victoria less than one percent of advertised rental properties in 2015 were affordable³ for low income families (Anglicare, 2015). Rental affordability must be taken into consideration in the implementation of any of the solutions discussed. Support for Solution 2 and Solution 5, will rapidly decline if they result in significant rent increases.

Finally, another consistent theme that arose was the desire from renters for longer and/or more secure rental leases which in turn would encourage renters to invest in more energy efficiency improvements. In Victoria the maximum lease contract is 12 months, and irrespective of the length of time a renter has been in a property a landlord is only required to give 90 days' notice for eviction or less in some circumstances (Hulse et al., 2010). This is not the standard internationally. Ireland, Denmark, Netherlands, Sweden and Germany all offer either multi-year or unlimited rental leases, and have much tighter restrictions on eviction of renters (Hulse et al., 2010). Anecdotal evidence from this study suggests that longer, more secure rental leases would result in greater uptake of energy efficiency improvements.

Some of the findings of this study may be able to be applied in other rental markets. However, local political, regulatory, market and cultural contexts will define the degree to which these findings may be applicable, if at all. For example, some aspects of Australia's housing market are unique, as no other country except New Zealand encourages investment in housing by allowing people to use rental losses to reduce taxable income. This coupled with a fifty percent capital gains tax has resulted in the highest levels of investment levels in housing in the OECD (Daley et al., 2016). For this reason, the finding that enabling tax offsetting of energy efficiency improvements would increase landlord's willingness to make improvements, is particular to Australia. However, the finding that security of tenure would encourage tenants to improve properties themselves, is likely to be universal.

It is also important to note that the above findings and following recommendations should be considered in light of the sample size of the survey. This is especially important in relation to the landlord responses, considering the relatively small sample size in comparison to the renters. Greater weight should thus be given to the responses from renters with further research needed to gain a greater understanding of the priorities of landlords.

5.1. Key recommendations

This study has produced a series of key recommendations for solutions to overcome the barriers to improving the energy efficiency of rental properties. The solutions are listed below in order of difficulty in implementation. This study confirms the findings by de T'Serclaes (2007) in his review of existing policy responses to the financial barriers of energy efficiency, that "capital availability is not the most important tool in overcoming energy efficiency's financial barrier. Instead, the solution lies in carefully designed policy packages, and strong political will" (de T'Serclaes, 2007, p 6). Unfortunately, this political will is severely lacking in Australia with tax rebates for most low carbon energy solutions being wound back, including solar feed-in tariffs, solar panel rebates, the Renewable Energy Target and home

² Solution 3, a residential green lease, was the least supported despite this solution being widely promoted for commercial rentals (Brooks, 2008). This suggests a greater perceived power imbalance between stakeholders in rental properties than commercial.

³ Rental housing is classified as unaffordable if rent payments are more than 30% of the households total income per month (Anglicare, 2015).

insulation rebates. Over the last 10 years, the political will for this type of rebate has eroded and therefore the most 'politically possible' solution appears to be including energy efficiency improvements in current tax offsetting laws. In reality, a greater uptake of energy efficiency improvements in rental properties will most likely result from a multi-faceted approach.

Solutions that could be readily implemented:

- Increased education and awareness of what changes renters can make to rental properties.
- Increased promotion of the VEET scheme, aimed at landlords and renters.
- Informing renters of the ability to negotiate energy efficiency improvements when agents or landlords request a rent increase.
- Further research testing the supported solutions with a wider audience.
- Ensure communication and promotion of energy efficiency improvements advertise their multiple benefits, including: financial savings, comfort, smart investment, the feel good factor, reduced emissions and conserved resources.

Solutions that require legislative change:

- Making a change to the Tax Assessment Act 1997 to include energy efficiency improvements under 'repairs' to a rental property, so that the full cost of the repair is tax deductible in the same financial year.
- Minimum energy efficiency standards for rental properties. A phased in approach, combined with financial incentives for landlords to get their property to standard, is recommended to ensure the least resistance.
- Provide the opportunity for longer rental leases with greater security from eviction.

This study provides an important foundation for building a more effective and equitable energy efficiency market for the rental sector. With further research, consultation and communication with landlords, renters and agents, the solutions identified as supported in this study have a greater chance of gaining broader acceptance and being implemented. Altogether the results and recommendations from this study provide direction for community, business and political leaders to create a well-designed package of solutions for improving the energy efficiency of private rental properties.

References

- Allcott, H., Greenstone, M., 2012. Is there an energy efficiency gap?, *National Bureau of Economic Research. Massachusetts Institute of Technology*, 1–39.
- Anglicare Australia, 2015. Anglicare Australia Rental Affordability Snapshot, Canberra, (Accessed May 2015) at (http://www.anglicare.asn.au/site/rental_affordability_snapshot.php).
- Australian Bureau of Statistics (ABS), 2008. Environmental issues: Energy use and conservation, Cat. no. 4602. 0.55.001.
- Australian Bureau of Statistics (ABS), 2013. 2011 Quick Stats, (Accessed September 2014) at (http://www.censusdata.abs.gov.au/census_services/getproduct/census/2011/quickstat/2GMEL?OpenDocument&navpos=220).
- Australian Energy Regulator (AER), 2013. Regulation of alternative energy sellers under the National Energy Retail Law: issues paper, Commonwealth of Australia.
- Australian Tax Office (ATO), 2012. Taxation statistics 2011–2012, at (<http://data.gov.au/dataset/95d9e550-8b36-4273-8df7-2b76c140e73a/resource/cabdb296-2e95-4413-8f5c-01687600e6f6/download/taxstats2012individual14percentiledistributionoftaxableindividuals.xlsx>) (accessed June 2017).
- Australian Tax Office (ATO), 2015. Taxation ruling income tax: deductions for 'repairs', (Accessed May 2015) at (<http://law.ato.gov.au/atolaw/view.htm?Rank=find&criteria=AND~TR~basic~exact::AND~97%2F23~basic~exact&target=EA&style=java&sdoid=TXR/TR9723/NAT/ATO/00001&recStart=1&PiT=99991231235958&Archived=false&recnum=16&tot=40&pn=ALL::ALL>).
- Bird, S., Hernández, D., 2012. Policy options for the split incentive: increasing energy efficiency for low-income renters. *Energy Policy* 48, 506–514.
- Brooks, M., 2008. Green Leases: the next step in greening commercial buildings, Real Property Estate Association of Canada, (Accessed May 2015) at (https://professional.sauder.ubc.ca/re_creditprogram/course_resources/courses/content/331/brooks-green.pdf).
- Bureau of Resources and Energy Economics (BREE), 2014. 2014 Australian Energy Update, Canberra, July.
- Burfurd, I., Gangadharan, L., Nemes, V., 2012. Stars and standards: energy efficiency in rental markets. *J. Environ. Econ. Manag.* 64 (2), 153–168.
- Chester, L., 2013. The impacts and consequences for low-income Australian households of rising energy prices, Department of Political Economy, University of Sydney, Sydney, Australia.
- Collyer, D., 2011. Australia's fatal flaw: negative gearing, (Accessed April 2015) at (<http://www.prosper.org.au/2011/05/25/australia%E2%80%99s-fatal-flaw-negative-gearing/>).
- Consumer Affairs Victoria (CAV), 2015. Laying the Groundwork Consultation Paper, Residential Tenancies Act Review – Fairer Safer Housing, (Accessed March 2016) at (<http://fairersaferhousing.vic.gov.au/renting/>).
- Council of Australian Governments (COAG), 2008. National Strategy on Energy Efficiency, (Accessed May 2015) at (https://www.coag.gov.au/sites/default/files/National_strategy_energy_efficiency.pdf).
- Couper, M.P., 2000. Review: web surveys: a review of issues and approaches. *Public Opin. Q.* 64, 464–494.
- Daley, J., Wood, D., Parsonage, H., 2016. Hot property: negative gearing and capital gains tax reform, Grattan Institute, Melbourne.
- de T'Serclaes, P., 2007. Financing energy efficient homes, IEA Information Paper, Paris, France.
- de T'Serclaes, P., Jollands, N., 2007. Mind the gap: quantifying principal-agent problems in energy efficiency, International Energy Agency and the Organization for Economic Cooperation and Development, Paris.
- Department of Economic Development, Jobs, Transport and Resources (DEDJTR), 2015. Setting Future Victorian Energy Efficiency Targets, Consultation paper, at (<http://www.delwp.vic.gov.au/energy/legislation/?a=349779>) (accessed April 2015).
- Department of Sustainability and Environment (DSE), 2009. Housing condition/energy performance of rental properties in Victoria, Victorian Government, Melbourne.
- Dillon, R., Learmonth, B., McInnes, D., Thompson, K., Bowen, K., 2010. Just Change Evaluation Report: Energy Efficiency for Low-income Renters in Victoria, available at (www.justchangeaustralia.org).
- Energy Efficiency Council (EEC), 2016. Australian Energy Efficiency Policy Handbook: Save Energy, Grow the Economy, (Accessed July 2016) at (<http://www.eec.org.au/policy-advocacy/handbook>).
- Farenga, S., Joyce, B.A., Ness, D., 2010. Investigating green: creating surveys to answer questions. *Sci. Scope* 33 (7), 12–16.
- Gabriel, M., Watson, P., 2010. The environmental sustainability of Australia's private rental housing stock. *AHURI* 145, 1–4.
- GEMenergy, 2014. Pay as you save solar, (Accessed October 2014) at (<http://www.gemenergy.com.au/solar-finance-options/-/%20example%20of%20aussie%20PAYG>).
- Greening, L., Greene, D.L., Difiglio, C., 2000. Energy efficiency and consumption—the rebound effect—a survey. *Energy Policy* 28 (6), 389–401.
- Howden-Chapman, P., Matheson, A., Crane, J., Viggers, H., Cunningham, M., Blakely, T., Davie, G., 2007. Effect of insulating existing houses on health inequality: cluster randomised study in the community. *BMJ* 334 (7607), 460–469.
- Hulse, K., Jones, C., Pawson, H., 2010. Tenorial "competition", tenure dynamics and the private rented sector: an international reappraisal. *J. Eur. Real Estate Res.* 3 (2), 138–156.
- Johnson, V., Sullivan, D., 2012. The power to save: An equity analysis of the Victorian Energy Saver Incentive in Melbourne, Brotherhood of St Lawrence, Melbourne.
- National Statistical Service, 2016. Sample size calculator, (Accessed March 2016) at (<http://www.nss.gov.au/nss/home.nsf/pages/Sample+size+calculator>).
- Patton, M., 1990. Qualitative evaluation and research methods. Sage Publications, Newbury Park, California.
- Riedy, C., Wilson, E., Cheney, H., Tarlo, K., 2004. Community EmPOWERment, Final research report, Institute for Sustainable Futures, University of Technology Sydney, for Moreland Energy Foundation, Melbourne, Australia.
- Robbins, N.B., Heiberger, R.M., 2011. Plotting Likert and other rating scales, Proceedings of the 2011 Joint Statistical Meeting, (Accessed February 2015) at (https://www.amstat.org/sections/srms/Proceedings/y2011/Files/300784_64164.pdf).
- Scolaro, D., 2006. Tax Rulings: opinion or law? The need for an independent rule-maker. *Revenue Law J.* 16 (1), 1–34.
- Sorrell, S., O'Malley, E., Schleich, J., Scott, S., 2004. The Economics of Energy Efficiency. Edward Elgar, Cheltenham, UK.
- State Government of Victoria (VicGov), 2015. National phase out of greenhouse intensive domestic water heaters, (Accessed May 2015) at (<http://www.energyandresources.vic.gov.au/energy/environment-and-community/energy-efficiency/water-heaters>).
- Stone, W., Burke, T., Hulse, K., Ralston, L., 2013. Long-term private rental in a changing Australian private rental sector (AHURI Final Report No.209). Australian Housing and Urban Research Institute, Melbourne.
- Strempe, A., Horne, R., Dalton, T., Berry, M., 2010. Understanding drivers, attitudes, and barriers to 'green' investment by landlords of private rental properties in Victoria – Stage 2, unpublished article, pp 1–151.
- Sullivan, D., 2007. Climate Change: Addressing the Needs of Low-income Households in the Private Rental Market. Brotherhood of St Lawrence, Melbourne.
- The Australian Greens (Greens), 2014. Residential Tenancies Amendment (Housing Standards) Bill 2013, (Accessed January 2015) at (<http://greens.org.au/residential-tenancies-amendment-housing-standards-bill-2013>).
- Ungar, L., Sobin, R., Humphrey, N., Simchak, T., Gonzalez, N., 2012. Guiding the Invisible Hand: Policies to Address Market Barriers to Energy Efficiency. ACEEE Summer Study on Energy Efficiency in Buildings, Washington DC.

United Nations Framework on Climate Change (UNFCCC), 2015.

Adoption of the Paris Agreement, accessed March at (<http://unfccc.int/resource/docs/2015/cop21/eng/l09r01.pdf>).

United Nations Department of Economic and Social Affairs (UNESA), 2007. Promoting climate-friendly household consumption patterns. Sustain. Dev. Policy Integr. Anal.

Branch, 2–35.

Williams, B.E., 2008. Overcoming barriers to energy efficiency for rental housing. Doctoral dissertation. Massachusetts Institute of Technology.

Zipprich, A., Moss, J., Manohar, N., Wolbring, G., Macer, D., 2010. Energy equity and environmental security. Prelim. Draft, 1–42.