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Warm, cool and energy-affordable housing policy solutions for low-income renters

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Acronyms and abbreviations used in this report

ACT	Australian Capital Territory
AHCD	Australian Housing Conditions Dataset
AHURI	Australian Housing and Urban Research Institute Limited
ARC	Australian Research Council
COAG	Council of Australian Governments
HEET	Housing Energy Efficiency Transitions
LED	Light-emitting diode
LIEEP	Low Income Energy Efficiency Program
NatHERS	Nationwide House Energy Rating Scheme
NGO	Non-government organisation
NSW	New South Wales
PV	Photovoltaic
UK	United Kingdom
Vic.	Victoria

Glossary

A list of definitions for terms commonly used by AHURI is available on the AHURI website www.ahuri.edu.au/research/glossary.

Executive summary

Key points

This report presents the findings of an Investigative Panel that examined the prevalence and experience of energy hardship, in its different forms, within Australia's rental housing market. The research considered the strategies and policy actions that could be taken to reduce the impact of energy hardship on the lives of Australian households. Important findings include the following.

- Exposure to energy hardship is particularly likely when vulnerable people—i.e. those with very low or no income, existing health issues, lack of support networks, or who face entrenched disadvantage—live in dwellings that are in poor condition.
- Across the private and social rental sectors, the challenges are different with respect to resident/tenant and landlord/property manager relationships, tenants' rights, and the material condition of housing. Hence, the responses required to improve thermal efficiency and reduce energy hardship need to be tailored to the different tenant cohorts.
- No single set of policies or governmental actions will be able to meet the challenge of improving energy efficiency in the rental housing stock. Instead, a portfolio of measures is needed—including, for instance, mandatory building standards, targeted financial or material assistance for very vulnerable households, and investment in the public housing sector.

- **Setting minimum standards for the energy performance of rental properties is a critical starting point in the process of reform, which some jurisdictions have already begun to undertake, independent of national leadership. Mandating acceptable levels of thermal performance across the nation’s rental housing stock is likely to deliver a population-wide benefit. However, such requirements are also likely to encounter resistance from many stakeholders within the property industry due to perceived added costs.**
- **Developing a consensus on what constitutes ‘safe’ housing—and tenants’ rights to it—among key government players, non-government stakeholders and housing providers would greatly assist in enabling policy action.**

This research examined the incidence of energy hardship within Australia's rental housing market, and considered the strategies and policy actions that could be taken to reduce its impact on the lives of Australian households. Energy hardship is conceptualised in this present work in its broadest sense, to include absolute measures of financial hardship, consensual or subjective reflections on households' lived experiences, and circumstances where residents are limiting their energy use for normal daily activities.

This work was undertaken in recognition of the fact that tenants, and especially private tenants, are often the poorest and most vulnerable within Australian society—and that, significantly, as tenants, they do not have the legal right or authority to modify their dwellings in order to improve thermal performance and energy efficiency. Too often, Australians in the private rental market find themselves paying a significant percentage of their income for housing that offers inadequate protection from temperature extremes during summer and winter. Heating and cooling efforts to achieve acceptable temperatures result in elevated energy usage and higher costs for an already financially disadvantaged population. In some instances, households cannot afford, or choose to go without, substantial energy use and may suffer adverse impacts on their health and quality of life.

Key findings

The research brought together a review of the existing literature and current Australian policy, secondary data analysis, and the perspectives of key stakeholders and experts to provide essential evidence on the vulnerability of public and private tenants to energy hardship and poor housing conditions.

The research found that exposure to energy hardship is particularly likely when vulnerable people live in dwellings that are in poor condition. The cohorts mostly likely to be exposed to energy hardship follow existing, broader patterns of social and economic disadvantage. This was reflected in our review of the existing literature and the target cohorts for current intervention strategies, as well as our analysis of the Australian Housing Conditions Dataset (AHCD) and the Housing Energy Efficiency Transitions (HEET) interviews. Discussions with key stakeholders and the Project Panel revealed that existing forms of assistance are likely not reaching these particularly vulnerable cohorts, and that these groups are often difficult to assist because they face multiple and complex barriers to improving their living environments.

Our review of current programs that aim to improve energy affordability and efficiency in people's homes found that many of the schemes are not specific to tenant households and are small in scale or have limited eligibility. In some cases, the programs are regressive (i.e. the benefits are granted to people who have the capital to 'buy in' to the scheme, while costs increase for those unable to participate). The outcomes of current programs remain largely unevaluated.

The Panel discussions highlighted the need to scale up existing effective programs; to more consistently and holistically evaluate the benefits afforded by such programs across a range of outcomes (not only economic); and to better target assistance to those households most in need, ideally prior to adverse effects becoming acute.

Overall, the research documented several key barriers to policy change that targets improved conditions within the public and private rental sectors. A significant barrier raised by many of the key stakeholders and panellists centred on funding issues, whether across federal or state/territory governments, private investor landlords, or community housing providers. This barrier was closely linked with the prevailing view of housing as a commodity in Australia, which some stakeholders cited as a deterrent for major policy change in this area. Another important challenge in the governance and formation of various intervention strategies, identified by the Project Panel, is the need to work collaboratively across government departments, different levels of government and jurisdictions to overcome discrete departmental mandates, which frame funding opportunities and areas of potential influence.

The research findings highlight a need to prioritise tenant households' health and wellbeing as the primary objective of policy intervention and evaluation. Doing so not only opens up a wider range of strategies that might be used to assist households in improving their living environments, but also presents a compelling narrative to support allocation of government resources and funding. Narratives around potential co-benefits—for example, in relation to carbon emissions reduction, employment and training opportunities—are complementary to the central priority of health and wellbeing, and have the potential to strengthen overall advocacy in this area. However, there is currently a lack of comprehensive, population-based Australian evidence on the specific causal relationship between improved living conditions and benefits to health and wellbeing. While the international evidence suggests the need for a strong reform pathway, there is considerable scope for Australian-focussed work to contextualise and validate the global evidence.

The Project Panel discussions clearly identified important roles for government and non-government organisations (NGOs) in initiating and delivering energy hardship and housing support services. The primary role of government, at all three levels, should centre on attaining adequate funding and creating pathways for regulatory change (e.g. minimum building standards). NGOs, including community housing providers, welfare support organisations and tenant advocates, play powerful roles in identifying and generating awareness about specific problems, and can potentially provide more effective delivery of services through their existing client networks. Notably, while investor landlords were identified by participants as incredibly important actors within this setting, few solutions that relied on their voluntary participation were considered potentially effective or feasible.

Based on the findings of the research, we propose policy pathways for interventions by government and non-government service-providers to improve the living environments and health and wellbeing of tenants.

Policy development options

This project was finalised as the impacts of COVID-19 on the health of the Australian population and the buoyancy of the national economy were only just being realised. In many ways, this crisis has brought to the fore questions around the relationship between housing and health, as individuals and households are focussed on their wellbeing and the adequacy of their home.

The need for wholesale improvement of the energy performance of housing stock across Australia's rental sectors was a persistent theme throughout this research—evident in the published literature, the Panel discussions, and the primary data collected from affected individuals. Importantly, however, the Panel concluded that, to date, and likely into the future, there is no single set of policies or governmental actions able to meet the challenge of improving energy efficiency in the rental housing stock. Instead, a portfolio of measures is needed. The potentially most impactful policy options are discussed here.

Setting minimum standards for the energy performance of rental properties is a critical starting point in the process of reform. As Panel discussions and interviews with key informants noted, 'there's no point putting water in a leaky bucket'. That is, the thermal performance of the built stock needs to be improved if better outcomes are to be achieved with respect to improving health and minimising energy costs. Some jurisdictions have already taken steps to achieve this goal, but it is important to differentiate the policy levers and actions available in the private rental market relative to social housing.

Additional policy options thought to be feasible within the context of Australia's private rental sector include the following.

- Mandating a higher standard of thermal performance for all new properties, with the expectation that a high percentage of properties will pass through the rental market at some stage.
- Mandating the disclosure of the thermal performance of rental properties prior to letting. This would provide potential tenants with information on their likely energy costs and/or impacts on comfort.
- Providing platforms that assist the voluntary disclosure of thermal performance such that landlords or tenants could provide this information to prospective residents.

It is important to acknowledge that current market dynamics present some barriers to the viability of these policy opportunities. Mandating higher levels of thermal performance across the rental sector is likely to deliver a population-wide benefit, but is likely to encounter resistance from many within the industry, especially on the grounds of negative impacts with respect to housing affordability. However, such opposition is largely unjustified, as regulating for a higher level of thermal performance does not erode the market position of any individual builder or operator, and the large-scale adoption of energy-saving technologies will drive down the price of these innovations.

Setting higher standards for new builds will exert only a marginal impact on the thermal performance of the housing stock overall, because new dwellings account for a small percentage (as low as 2% each year) of the total accommodation pool. Other policy measures are therefore needed. These could include schemes that encourage the installation of energy-saving measures, either through the tax system, grant programs or co-funding. For example, landlords could be allowed to write-off, within the tax system, the cost of upgrades that improve thermal performance (e.g. replacing conventional hot-water systems with heat pumps, or installing solar panels)—this would provide a strong incentive for some landlords. Currently, landlords can write-off the cost of replacement features in a home (i.e. replaced on a 'like-for-like' basis) but not upgrades. Alternatively, both the Australian Government and state/territory governments could introduce grant programs to facilitate investment. Conceivably, such programs could be tied by linked to investment income or property portfolio size, and accessible on the basis of achieving set minimum building standards. Critically, such programs could provide an important stimulus to the Australian economy during recovery from the economic ill effects of COVID-19, while providing long-term benefits to the health of the nation.

The second major policy option to be considered here is mandating the disclosure of the thermal performance of properties—as now widely established within the public and private rental sectors in the United Kingdom (UK), for example. Such actions have been implemented in some Australian jurisdictions, such as the Australian Capital Territory (ACT), and could be introduced at a national level. However, we need to acknowledge that such measures represent an additional form of regulation that may have little real impact in a tight rental market in which tenants often take the property they can afford and can get into, not the property they would choose.

In policy terms, there seems to be greater value in focussing on the development of web-based platforms where landlords—or tenants—are encouraged to provide information on the energy efficiency of their dwelling or approximate energy costs based on the current lease. In a competitive market, such information sources will no doubt be taken up and landlords will come to appreciate the advantage of having a better-performing property. This approach seeks to facilitate or enhance the market rather than impose additional regulation.

The private rental market presents one set of challenges for improved thermal efficiency in housing, while the social housing stock presents another set of issues. As a series of reports by the Australian Institute of Health and Welfare (AIHW) (e.g. see AIHW, 2019) has shown, Australia's public housing stock represents some of the poorest-quality and unhealthiest housing in the nation. This is due to the age of much of that stock, backlogs in maintenance, and the selling off of better-quality properties over the past fifty years. Much of the remaining stock was built to a relatively low standard and has now passed its reasonable economic life (i.e. though occupied, it is not able to be maintained or retrofitted cost effectively). The challenge of housing quality is evident within the stock managed by housing associations and other not-for-profit providers, as a significant percentage of their rental properties have been transferred from public housing. In some instances, these organisations have been able to—or required to—elevate their maintenance programs, but many of the shortcomings in the stock remain.

The attitude of tenants is a compounding factor in attempts to find a resolution to the problem of thermal performance of social housing. As our fieldwork shows, while private tenants view themselves as consumers and advocate for better outcomes, many social housing sector tenants are grateful for the security and low cost of their tenure, and are more accepting of homes that do not offer thermal comfort and impose high energy costs.

Investment in the public housing stock—both through a comprehensive knock-down-and-rebuild program as well as enhanced maintenance expenditures—may be one of the most viable pathways for enhancing thermal performance in Australia's social housing stock. Such large investment in construction would also serve to stimulate employment and economic activity at a low point in the economic cycle. In addition, it is desirable that existing rebates and improvement schemes be made available to the public sector (i.e. not just to community housing providers or the private rental market) in order to improve the material condition of the public housing stock.

The study

The Investigative Panel considered how best to improve energy affordability and dwelling energy efficiency in Australia's rental sector, bringing together stakeholders from the private landlord sector (investor landlords), the energy market and energy-efficiency professions, social and government housing providers, developers, and tenant organisations.

Up to 40% of Australian households who rent their housing experience energy hardship. Many of these households are forced by market pressures to live in homes that are expensive to heat and cool due to a lack of minimum energy performance standards. Formulating effective solutions to problems of unaffordable energy and thermally inefficient housing in the low-cost rental sector is particularly challenging because of 'split incentives', and other tenancy and financial barriers. Existing and new technologies present an opportunity to improve housing energy efficiency through retrofitting, and to reduce the cost of energy through 'bulk-buy' pricing schemes (i.e. collectively negotiated energy retail contracts). However, current policy settings focus mainly on home owners—further specific attention for renters is required.

There are now a number of programs and projects, developed both in Australia and internationally, which have attempted to address rental energy affordability. To understand which solutions should be prioritised, and for whom, the Investigative Panel project was organised into four components:

- a review of academic and grey literature on energy hardship and housing conditions within the Australian social and private rental sectors
- analysis of secondary qualitative and quantitative data focussed on tenant experiences
- a series of focus groups in Port Augusta, Melbourne and Sydney to reveal and document key barriers to improving housing conditions and energy-affordability, and emerging opportunities
- two national Project Panel deliberations.

Bringing together the ideas, discussions and outcomes of these four components, this report aims to provide a roadmap for the better design and targeting of energy hardship intervention measures for low-income renters in Australia.

1. Introduction to this research

This research addresses an ‘apex’ problem in modern Australia: a meeting of rapidly rising energy costs, a large stock of poor-quality and energy-inefficient dwellings in the rental sector, uneven access to efficient technologies and government interventions, and a large number of households in financial hardship.

It is estimated that up to 40 per cent of Australian households who rent their housing may be experiencing energy hardship. The community, governments and the property sector are looking for guidance on which strategies or approaches can work to improve energy affordability and efficiency of dwellings in the rental sector.

1.1 Why this research was conducted

Across all the main forms of tenure, household expenditure on domestic fuel and power, as a proportion of total expenditure, rose in the period 2009/10 to 2015/16 by up to 37 per cent (ABS 2017a; 2017b). For those who cannot afford new, energy-efficient technology, this potentially means cutting back on heating and cooling. This observation underlines one of the biggest challenges for housing policy makers, the not-for-profit sector and private investor landlords alike (ACOSS 2017; CHIA 2018). The effects of energy hardship are a particular concern for government housing agencies, who hold the double burden of large stocks of old, energy-inefficient dwellings, alongside a social responsibility to provide adequate and healthy housing.

Up to 40 per cent of Australian households who rent their housing (renters) may be experiencing energy hardship (Azpitarte, Johnson et al. 2015; Sullivan 2007), forced by market pressures to live in homes that are relatively expensive to heat, cool and power. In many cases, tenants may have lower energy consumption than owner-occupiers, but tend also to be on lower incomes and so spend proportionally more of their income on energy bills.

Policy responses are challenging in a rental sector that is mainly privatised—although there are important social and public housing components. Mandatory disclosure of energy efficiency and minimum standards regulations present a cost across the rental stock, and this would be ultimately borne by renters through increased rents. More limited, targeted approaches present their own challenges, including in ensuring that support reaches the more vulnerable renters who face energy hardship. Existing and new technologies present opportunities for a variety of interventions.

The Australian community, governments and the property sector are seeking guidance on which strategies or approaches can work to improve energy affordability and the efficiency of dwellings in the rental sector. This Investigative Panel brings together representatives of the private investor landlord sector, the energy market and energy-efficiency professions, social and government housing providers, developers, and tenant representatives to consider the challenges and possible solutions to improving the energy performance of Australia's rental stock. This project represents the first and most comprehensive gathering of participants and stakeholders around this problem to date.

1.2 Policy context

Policy pertaining to rental energy affordability is situated within the broader context of building regulations; emerging regulatory frameworks on energy-efficient retrofit and supporting measures to encourage this activity; and public health concern about morbidity associated with poor housing conditions. New housing must meet minimum energy-efficiency requirements, and these requirements have stepped up in stringency since they were first incorporated into the Building Code of Australia in 2003 (now the National Construction Code). Major renovations subject to building regulation are also subject to energy-efficiency provisions within the code, and these provisions are applicable to all housing, regardless of tenure of occupants.

There are limited regulations relating to retrofit activities, unless the retrofit is deemed to be a major renovation subject to building regulation. A range of alterations and additions that either fall outside the regulations, or are undertaken in the informal system, present problems for energy efficiency in housing when they lead to compromised building envelope efficiency. For example, poor installation of ducting of various sorts may puncture the building envelope and create bridging or other thermal problems, leading to loss of energy efficiency.

A wide range of regulations, incentives, programs and support measures seek to promote retrofit technologies and activities to improve energy efficiency. These invariably favour particular arrangements over others: for example, owner-occupiers over renters. Many retrofit activities are simply not available to renters except by request or negotiation with landlords. In many cases, the appliances that are available to renters provide inferior energy efficiency or utility, and higher operational costs, compared to the alternatives available to owner-occupiers (e.g. mobile heaters versus fixed systems).

The complexity of the rental energy affordability problem arises from its socio-materiality, its jurisdictional ambiguity, its often hidden nature, and its heterogeneity. Energy hardship is a dynamic condition produced by intersections in the social, economic and material fabric of everyday life. In rental housing, added problems arise from the fact that tenant property rights are limited, and that the most vulnerable households in Australia fall into this tenure group. This makes addressing energy hardship a formidable policy challenge.

Strategies must address numerous concerns, including: property condition and energy-using technologies onsite; resources, capabilities, health and wellbeing of occupants; and motives and resources of landlords. Since renters often suffer behind closed doors, an individual's predisposition to communicating their distress, together with the strength of their social and family support systems are potentially important factors in detection of energy hardship, yet these are poorly understood in policy terms. Existing research in this area indicates the sorts of groups who are more likely to be vulnerable. However, within these groups, each renter's socio-material conditions and capability to afford to heat their home vary widely, resulting in a range of vulnerability and hardship statuses. Many of these problems, particularly concerning the material quality of dwellings, have not been sufficiently quantified through existing data and monitoring mechanisms. There is, for example, no systematic or extensive national property condition database (let alone one for rental) and, in any event, retrofit and appliance technology changes ensure properties are regularly modified over their lifetime, producing an extreme diversity of stock condition.

Inevitably, current policy responses to address rental energy affordability intersect jurisdictions and government departments. Federal government is responsible for social services legislation, such as family support and pensions, but also convenes national building regulation negotiations through the Council of Australian Governments (COAG) and holds the purse strings of key taxation-based budgeting for national public works. State/territory governments have responsibility for community health services, social housing (including public housing), rental assistance, electricity and gas supply. Local governments have responsibility for town planning and building regulations, and have a unique window into households through provision of frontline services such as Meals on Wheels and child welfare services.

Current policy and program responses span a wide spectrum. At one extreme are regressive schemes that aim to promote energy efficiency but result in further advantages for those households who are already relatively advantaged and extra burdens for those who are vulnerable. Non-means-tested support for renewable energy, funded from utility price rises, is a good example, as such schemes favour home owners with savings but impose energy price rises on renters with no savings. At the other extreme are small, highly localised, highly targeted interventions designed to address a particular energy hardship group, problem or locale. These schemes are often time-limited, complex in terms of design and administration, and necessarily require an exhaustive process of checking eligibility and suitability.

Relatively few interventions are renter-specific or address known market failures such as principal-agent/split incentive issues; information asymmetry problems and other agency/power imbalances; and financial constraints. Rarely do they offer protection of ongoing rental rates and tenure conditions following the advent of energy-efficiency retrofits, or provide renters with support to access efficiency/pricing options. It is also important to note that the majority of private rental dwellings are managed by property agents, so any schemes designed to encourage energy affordability amongst these properties should engage with, or otherwise take account of, property management practices, and currently there is little evidence that they do.

Amongst the schemes that are designed specifically for renters, promising programs include those where landlords can recoup the cost of upgrades through council rates (e.g. Solar Savers Adelaide; Victoria's Solar Homes program). As the upgrades improve rentability, there is a need to control for future rent increases and to provide renter tenure security—this is a feature of at least some of these schemes. Public housing and community housing upgrades (e.g. Latrobe Valley Home Energy Upgrade Program, Victoria) are simpler, as the 'landlord' is a not-for-profit entity (as opposed to for-profit schemes, such as South Australia's Virtual Power Plant).

Access to renewable energy for renters is an emerging area. Renters cannot generally commission rooftop solar systems in the way that owner-occupiers (at least in detached dwellings) can, and they may or may not have the option to choose their energy suppliers or to opt in to green tariffs. However, there are emerging schemes that allow renters to access energy from specific offsite renewables (e.g. Enova's Solar Gardens). While such programs do not guarantee energy affordability—and pricing is important here, as the cost of renewables begins to drop below fossil-fuel power—such schemes may help with energy affordability in the medium term, depending upon the cost of maintaining grid connections.

Tenure-blind programs such as lighting upgrades (e.g. Victorian Energy Upgrades) are equally open to renters. However, penetration of these schemes is higher in owner-occupier stock. Renters are disproportionately represented in flats, where there is restricted access to non-residents, and this is a barrier to those organisations that use street door-to-door approaches to find customers for upgrades. Hence, these organisations tend to target detached dwellings or walk-in units, which are disproportionately owner-occupied.

Other schemes may favour renters, at least relatively, in cases where upgrades boost indoor comfort and reduce bills. In the Moreland Solar City project, for example, only 20 per cent of recipients of upgrades were renters, but renters generally appeared to have higher levels of satisfaction with the results than owner-occupiers. We can speculate that this might be due to the lower expectations that renters have about their own agency and living conditions.

1.3 Research methods

The research was guided by five key research questions, designed to enhance our knowledge of the experiences and causes of—and protections from—energy hardship among Australian renters.

- **RQ1:** What does research and policy tell us about energy hardship among renters in Australia, in terms of: prevalence; tenant characteristics; housing conditions; and the costs and benefits of improving living environments?
- **RQ2:** What government and non-government programs exist to improve energy efficiency and affordability? What lessons can be learnt from these?
- **RQ3:** What are the key governance challenges to uptake and implementation of energy interventions in Australia? What emerging opportunities should we be aware of?
- **RQ4:** How might existing and proposed energy interventions be framed differently to more effectively reach those groups most at risk?
- **RQ5:** What roles might different government and non-government service providers play?

To address these questions, the research was organised into a series of interrelated components: a review of existing research and policy; analysis of secondary qualitative and quantitative data; collection of primary data on the perspectives of stakeholders; and direct engagement with experts through the Project Panel meetings.

Overarching ethical approval for the research was attained from The University of Adelaide Human Research Ethics Committee (H-2019-128) and, as a condition of ethical approval, the anonymity of all participants is maintained in this reporting.

1.3.1 A review of existing research and policy

This component comprised a background review of the current landscape of the literature and policy on energy hardship and housing conditions within the social and private rental sectors (research questions 1 and 2).

The review consisted of:

- a review of the Australian peer-reviewed literature and known sources of information on this topic, using systematic-style search protocols of academic databases (e.g. Scopus)
- documentation of the grey literature, including research reports from government and NGOs, and the range of policy measures in place nationally and amongst the states and territories
- a review of the national and international evidence on the quantification of the costs and benefits of policy interventions that aim to improve living conditions or energy affordability in the rental sector.

The findings from this review informed the first Project Panel meeting and were summarised in an internal discussion paper that was presented to the participants of the second Project Panel meeting. The review, and policy implications, of existing research are presented in Chapter 2.

1.3.2 Secondary data analysis

The second component of the research leveraged data infrastructures administered by the study team for two related projects—the AHCD and HEET—to provide further insights relevant to research question 1. These analyses are reported in Chapter 3.

Quantitative descriptive analysis of the AHCD provides a snapshot of housing conditions in the public and private rental sectors, and in comparison to owner-occupied homes. The AHCD, which is funded by the Australian Research Council (ARC), contains information on the housing conditions, energy-efficiency features, and indoor environmental quality satisfaction of 4,500 households across South Australia, Victoria (Vic.) and New South Wales (NSW) collected in 2016. The full AHCD and technical report (Baker, Daniel et al. 2018) are available at <https://dataverse.ada.edu.au/dataset.xhtml?persistentId=doi:10.26193/RDMRD3>.

The AHCD analysis was complemented by analysis of a series of in-depth interviews with low-income social and private tenants in the rental sector, collected as part of the HEET project. The analysis focusses on key issues for, and barriers to, uptake of energy-efficiency interventions. Interviews were completed with five social housing tenants and five private rental tenants, and were audio recorded and fully transcribed. More details of the HEET research and interview protocols can be found at <https://cur.org.au/project/housing-energy-efficiency-transitions/>.

1.3.3 Focus group discussions and key informant interviews

Addressing research questions 3 and 4, a series of focus group discussions and key informant interviews were completed during September and October 2019, in Port Augusta, Adelaide, Melbourne and Sydney. Participants included representatives from local, state and federal government departments and institutes, peak property and investor bodies, tenant advocacy and support services, and social welfare support services. Interviewees were recruited from the researchers' existing professional networks and third parties (e.g. local council) and selected based on their expertise regarding policy, service delivery and householder experience. The discussions were guided by two broad questions, as well as a series of more targeted questions appropriate to the specific stakeholders and jurisdictions.

- What are the financial, personal and health costs of energy hardship and poor housing conditions in the social and private rental sectors?
- What kinds of programs or assistance measures may work to improve vulnerable households' living conditions?

Researchers took written notes of the focus group and interview discussions (i.e. rather than audio recording and then transcribing) to encourage participants to more openly share their perspectives. Insights from these discussions are presented in Chapter 4, together with analysis of the Project Panels.

1.3.4 Project Panel discussions

Two Project Panel meetings were held to facilitate direct contact and discussion with primary stakeholders from government and non-government sectors. The panellists were recruited, using a quasi-Delphi method, primarily from the researchers' existing professional networks, but supplemented with new contacts to ensure a diversity of perspectives was gathered. While there was no crossover between focus group informants and panellists, the participants of each component represented similar stakeholder bodies. The results of the two Project Panel meetings are presented in Chapter 4, along with the results of the focus group discussions and key informant interviews.

The first Panel meeting, held in August 2019, spanned a range of topics, including the following.

- What might be the risks to tenants if energy costs are too high (and is this different for different people) and healthy living environments cannot be maintained?
- What strategies work to overcome logistical and other hurdles for implementing renewable energy and energy-saving interventions in social and private rental housing?
- What are current approaches to, and perspectives on, the costs of providing energy subsidies to tenants and landlords?
- Do you know of any particularly innovative approaches to the provision of energy-efficient rental homes across Australia or internationally?
- In what ways can we, as a policy and research community, engage with and encourage stakeholders and gatekeepers in order to increase provision of energy-efficient dwellings?
- What are the 'tipping points' at which sustainable energy technologies and approaches may provide greater social and economic benefits than current approaches?

The second Project Panel meeting was held in November 2019. This meeting was guided by a discussion paper that incorporated findings from the first three components of the project, as well as a reflection on the first Panel meeting. The Panel was asked to consider which intervention measures should be prioritised and for whom. Discussions were guided by the following questions.

- Which policy interventions (big and small) should be prioritised?
- What are the pathways required for advocating for such policy changes?
- What are the key sticking points or blockages to intervention?
- What kind of evidence do we need to make a case for policy change? Do we need more evidence?
- What is the narrative that we need to develop in order to see policy change?
- Who do we need to bring into future discussions? And how can we best communicate with them?

2. Review of research and policy

The review of existing research and policy that addresses energy hardship and housing conditions within the social and private rental sectors indicates that energy hardship disproportionately affects certain groups within our population.

This review highlights a need for:

- **scaling up:** more evaluation of promising programs and projects to inform systemic, scaled-up policy to be developed and implemented
- **specific focus:** policy designed to address the issues facing rental affordability and to avoid regressive effects
- **integration:** comprehensive, cross-government, cross-departmental, cross-jurisdictional approaches.

2.1 Overview

The review of existing research and policy shows that energy hardship disproportionately affects certain groups within our population. Both private and social renters are frequently found to experience a higher likelihood of being exposed to energy hardship than people in other tenures. The population groups that are particularly vulnerable to energy hardship are varied, and include rental households that comprise: single people (regardless of age); older people (particularly those on a pension); single-parent families; younger families (particularly those with young children); people with a medical condition and/or a disability; people on a low-income; the working poor and people living in poverty; people with lower educational attainment or poor access to the internet or information; culturally and linguistically diverse groups (including newly arrived immigrants and refugees); and Aboriginal and Torres Strait Islander peoples. The factors driving energy hardship and vulnerability to poor housing conditions are diverse across the different cohorts and, for some, intersect.

Dominant issues that present challenges to the rental sector, in particular, relate to market failures such as: principal-agent problems, information asymmetry and split incentives; a lack of agency for renters; landlords' priorities; imbalance of power in tenant-landlord relationships; informal lease arrangements; and the practices of the property management sector. Some renters are fearful of negative repercussions (e.g. rent increases or evictions), so do not make requests of their landlords—such issues are compounded in circumstances where there is no formal lease arrangement. Other challenges for renters identified in the literature include financial constraints, lack of information or awareness of 'energy-efficient features', non-standard electricity supply arrangements, and short-term lease periods.

The review indicates that, in general, financial hardship (i.e. low or no income) is a key driver of energy hardship problems for many households. For example, low-income households spend proportionately more on electricity compared to higher-income households. The main source of income for the majority of these households is government pensions and allowances. For renters, who comprise more than a third of low-income households, there is a significant incidence of late bill payment and reliance on energy concessions—one in ten rental households surveyed had been on a retailer hardship payment plan. Both social and private renters lack confidence in their ability to make informed decisions about electricity offers or options to access solar energy.

The literature documents several interventions and initiatives—at state, local and organisational levels—specifically targeted at renters or rental properties, though many are relatively recent or still in trial phase. Most initiatives are designed to ease the burden of energy costs of rental households: for example, through access to solar electricity. Initiatives that focus on benefits in comfort or health are less common.

State-based initiatives aim to improve access to information for renters, to allow them to switch energy contracts, access hardship programs, or participate in energy-efficiency upgrades—for instance, to replace lighting with light-emitting diodes (LEDs) or install standby power controllers. A number of states require energy retailers to offer assistance to low-income households, such as performing audits to identify improvements that may reduce energy use. Some state initiatives are aimed at landlords as well as renters. For example: mandatory energy-efficiency disclosure schemes (ACT); incentives to undertake energy-efficiency refurbishments for privately rented homes, and subsidies for solar photovoltaic (PV) (NT and Vic.); and financing of solar PV systems through council rates (South Australia).

Not-for-profit organisations offer no-interest loans for low-carbon refurbishments with rent increase protection (e.g. Citizens Own Renewable Energy Network Australia and Z-Net Uralla). Solar electricity initiatives include community-funded solar projects (Vic. and NSW), micro-grids for apartment buildings (Vic.), interest-free loans for solar PV systems (Vic.), and solar PV grants (Vic.). Some current initiatives specifically target public and social housing, including better-than-minimum energy-efficiency standards for new public housing (Vic.), highly energy-efficient public housing demonstration homes (Vic.), energy refurbishment programs for social housing (Vic. and NSW), energy refurbishment programs for public housing with an energy education component (Vic.), and solar PV initiatives for social housing (NSW, Queensland and South Australia). Aside from the evaluations undertaken for the Low Income Energy Efficiency Program (LIEEP), few studies evaluate the effectiveness of initiatives targeted toward improving the energy efficiency of housing generally, and even fewer evaluate initiatives targeting rental housing specifically.

Within the literature, recommendations for future policy included: ensuring clearer policy direction to avoid costly duplication of initiatives, improving energy literacy among residents, providing better access to solar energy, mandating minimum energy-efficiency requirements for dwellings, offering incentives to improve the material conditions of rental properties, and tax reform at both state and federal levels. There was broad support for policy that would adopt a comprehensive and multilayered approach.

2.2 Analysing the literature on energy hardship and housing conditions “in Australia’s rental sector

This section summarises the findings from a review of the Australian grey and academic literature considered to be most relevant to understanding the impact of dwelling quality on energy hardship. It commences by examining the definition of energy hardship and which groups in Australia are most likely to experience it, before reviewing what is known about the influence of housing conditions on energy hardship. The analysis concludes with a summary of initiatives that target renters and landlords to address energy hardship and recommended policy interventions.

2.2.1 Defining and measuring energy hardship

There is no single definition of ‘energy hardship’ in Australia, nor in many countries globally (Thomson, Snell et al. 2016). It is, in general, a concept that links energy, equity, housing and health (Rademaekers, Yearwood et al. 2016). The term was first used to describe fuel poverty in the UK in the 1990s (Boardman 1991)—manifested as an inability to heat one’s home adequately (WHO 2008: 64)—but has since broadened to include other forms of energy consumption in the home, as well as the various forms of, and issues related to, energy supply (Walker, McKenzie et al. 2014). Following literature on energy justice (Bouzarovski 2013; Thomson, Bouzarovski et al. 2017) and the United Nations’ sustainability goals (United Nations 2019), energy hardship may be defined as the lack of affordable, renewable and reliable energy services. Energy hardship can be temporary or persistent (VCOSS 2018) and is experienced across a spectrum (ACOSS, BSL and ANU CSRM 2018). Measuring energy hardship can take a quantitative (objective) or a qualitative (subjective) approach.

Quantitative approaches

Quantitative approaches generally measure energy affordability as the ratio of energy costs to income, which is then compared to either an absolute benchmark (e.g. 10%, as per Boardman 1991), or a relative benchmark, such as a national average or median (ACOSS, BSL and ANU CSRM 2018). Energy costs may be derived from simulations (DECC and BRE 2010), or from observed costs (Howden-Chapman, Viggers et al. 2012; Tirado Herrero, Fernández et al. 2012; WHO Europe 2007). Income may also be defined in various ways—e.g. including or excluding housing costs, and with or without adjustments for household size (Hills 2012).

In Australia, energy hardship based on the ratio of energy costs to household income is called ‘energy stress’ (ACOSS, BSL and ANU CSRM 2018). Households in energy stress spend a higher proportion of their income on energy compared to the average population. While measuring inequity may be determined by comparing the actual electricity prices that households are paying (Colmar Brunton 2018), Cornwell, Hejazi et al. (2016) concluded that the *required* energy expenditure, rather than an *actual* energy expenditure, would provide a more accurate measurement of energy poverty. Thus, using an absolute benchmark (e.g. 10%) and actual energy expenditure may underestimate the number of households who are compromising on heating or cooling.

Qualitative approaches

Qualitative approaches to measuring energy hardship are based on the understanding that there is a societal consensus that everyone should be able to heat—and in Australia also to cool—their home to adequate temperatures (Healy 2003; Nicholls, McCann et al. 2017a). In general, surveys are used to identify whether or not the householder is able to heat or cool the home when needed, whether they have had difficulty in making payments, and whether they have resorted to curtailment behaviours or coping strategies (Cornwell, Hejazi et al. 2016; Sartini, Tammes et al. 2018).

Qualitative approaches often take into consideration the broader context of the household and their living environment. For instance, vulnerability to energy hardship may be the manifestation of a combination of low income; high energy prices; poor thermal performance of the home; and limited adaptive capacity in terms of tenant agency, choice, control and ability to engage (ACCC 2018; Acil Allen 2018; ACOSS, BSL and The Climate Institute 2017; Bouzarovski, Petrova et al. 2014; Liu and Judd 2017, 2019; QCOSS 2017; VCOSS 2018). Other limitations in householder capabilities may be rooted in lower educational attainment, poor energy and financial literacy, and poor access to technology, information and the internet (Liu and Judd 2016, 2017; VCOSS 2010). More systemic drivers of energy hardship stem from tenancy and consumer laws, the privatisation of the energy market, and regulations around the physical conditions of the dwellings.

Other challenges in measuring energy hardship include the confounding factors of housing costs, the price of food, medical expenses and transport costs (ACOSS, BSL and ANU CSRM 2018; ACOSS, BSL and The Climate Institute 2017; Chester 2013; Cornwell, Hejazi et al. 2016; Liu and Judd 2016; Nance 2017), and the disproportionately high increase in energy prices over the past two decades when compared with other household expenses and concessions (Liu and Judd 2017).

Non-dwelling-related factors that can affect energy affordability are household type (ACOSS, BSL and ANU CSRM 2018), householder health conditions (ACOSS, BSL and The Climate Institute 2017), access to optimum energy prices or renewable electricity supply, and the energy market design—e.g. peak pricing and electronic billing (Nicholls, McCann et al. 2017b), the agility of consumer laws to adapt to new technologies (ACOSS, BSL and The Climate Institute 2017), and householder willingness to adopt alternative ways of accessing energy supply or to ask for assistance (Chester, Elliot et al. 2018; Liu and Judd 2016, 2017).

2.2.2 Identifying and characterising households in energy hardship

In recent years, researchers have called for a more multifaceted method of identifying and characterising households in energy hardship; one that combines a range of variables including dwelling energy efficiency and tenant socio-economic status and health (Castaño-Rosa, Solís-Guzmán et al. 2019; Tirado-Herrero 2017).

Energy hardship may disproportionately affect a diverse range of population groups. Although renting is associated with lower overall energy consumption than owning a home (Poruschi and Ambrey 2016), renters, and in particular low-income renters, are frequently found to experience a higher likelihood of being at risk of energy hardship (ACCC 2018; ACOSS and BSL 2019; ACOSS, BSL and ANU CSRM 2018; ACOSS, BSL and The Climate Institute 2017; Azpitarte, Johnson et al. 2015; Chester 2013; Colmar Brunton 2018; Energy Consult 2009; Johnson, Sullivan et al. 2013; Nance 2013, 2017; Poruschi and Ambrey 2016, 2018; VCOSS 2018). While private renters are more likely to experience continual energy stress, public housing renters are more likely to report not being able to heat their home adequately over several years (VCOSS 2018). An Australian study using data from the Household, Income and Labour Dynamics in Australia (HILDA) survey found that private renters featured most highly of all tenure groups among participants who reported that they were not able to heat their home or had defaulted on bill payments (Azpitarte, Johnson et al. 2015). Public housing tenants are more likely to be on an energy retailer payment plan or hardship program than private renters (Acil Allen 2018).

Many Aboriginal households report having large energy bills and difficulties in paying them (Bedggood, Farquharson et al. 2016). The Koorie Energy Efficiency Project (KEEP), funded by the Australian Government's LIEEP, aimed to address this specific disadvantage. The project's final report notes that Aboriginal households, most of whom rent, face a number of additional energy barriers: often they are caring for family members, which increases their energy burden; they feel stressed about their situation, including fearing the need to deal with energy providers due to previous negative experiences; and they worry about disconnection from services (Bedggood, Farquharson et al. 2016).

The population groups identified in the literature as being particularly vulnerable to energy hardship are summarised in Table 1.

Table 1: Summary of population groups particularly vulnerable to energy hardship

Vulnerable cohort	Source/s
Older households, including people living alone, or on a pension or with low income	ACCC 2018; ACOSS, BSL and ANU CSRM 2018; Liu and Judd 2016; Nance 2017; Nicholls, McCann et al. 2017b; Poruschi and Ambrey 2016; VCOSS 2018
Single-person and single-parent households	ACCC 2018; ACOSS, BSL and The Climate Institute 2017; ACOSS, BSL and ANU CSRM 2018; Azpitarte, Johnson et al. 2015; Cornwell, Hejazi et al. 2016; Liu and Judd 2016; Nance 2013, 2017; Poruschi and Ambrey 2018
Younger households and households with young children, including working families and younger people	ACOSS, BSL and The Climate Institute 2017; Nance 2017; VCOSS 2018
Large households (e.g. multi-generational families or shared housing arrangements)	Azpitarte, Johnson et al. 2015; Bedggood, Farquharson et al. 2016; Cornwell, Hejazi et al. 2016; Hogan and Salt 2017; Liu and Judd 2016; Poruschi and Ambrey 2016
Households with member/s with a medical condition, including people with a disability	ACCC 2018; ACOSS, BSL and The Climate Institute 2017; Azpitarte, Johnson et al. 2015; Nance 2017; Nicholls, McCann et al. 2017b; VCOSS 2018
Low-income, working-poor or households in poverty, including those with limited agency to retrofit their homes, or receiving income-support payments	ACCC 2018; ACOSS and BSL 2019; ACOSS, BSL and The Climate Institute 2017; ACOSS, BSL and ANU CSRM 2018; Azpitarte, Johnson et al. 2015; Chester, Elliot et al. 2018; CUAC 2014; Liu and Judd 2016, 2017; Nance 2013, 2017; Poruschi and Ambrey 2016, 2018; VCOSS 2018
Households with lower educational attainment, or poor access to information, including those with poor access to the internet	ACOSS and BSL 2019; ACCC 2018; VCOSS 2018
Culturally and linguistically diverse groups, including newly arrived immigrants and refugees	ACCC 2018; Nance 2013; Nicholls, McCann et al. 2017b
Aboriginal and Torres Strait Islander peoples	ACOSS, BSL and The Climate Institute 2017; Bedggood, Farquharson et al. 2016; Hogan and Salt 2017; Nance 2013
Apartment dwellers	ACOSS, BSL and The Climate Institute 2017; Poruschi and Ambrey 2018
Couples without children	Azpitarte, Johnson et al. 2015
Households with dual or multiple sources of fuel (e.g. gas and electricity)	CUAC 2014; Nance 2013
Households without solar panels	ACOSS, BSL and ANU CSRM 2018
Outright owners	Azpitarte, Johnson et al. 2015
Households in poor-quality housing	ACOSS, BSL and The Climate Institute 2017
Households in Tasmania or Victoria	CUAC 2014; Nance 2013

2.2.3 What is the impact of dwelling quality on energy consumption?

Energy consumption in a home is influenced by the climate of the locale and by housing design factors, including the thermal quality of the building envelope and the interior layout/spatial organisation (Poor, Thorpe et al. 2018). Energy consumption is also influenced by the efficiency of the systems and appliances used by householders (Whaley and Hamilton 2019). This section focusses on the impacts of the material quality of dwellings and appliances.

Although the vast majority of dwellings in Australia predate the introduction of minimum energy-efficiency ratings (ACOSS and BSL 2019), the age of a home may not necessarily predict higher energy consumption (Poruschi and Ambrey 2016). The thermal quality of the building envelope is a more important factor in predicting energy consumption for heating and cooling, and is dependent on the climate-specific physical thermal performance of the external walls, windows, roof and floor.

In heating-dominated climates, high insulation levels and airtightness of the envelope help to retain warmth (Ambrose and Syme 2017). Natural ventilation, external shading of windows and walls, and ceiling fans for air movement reduce the need for air conditioning during warm periods and in warm climates (Whaley and Hamilton 2019). These factors are considered in the Nationwide House Energy Rating Scheme (NatHERS) (2019). Minimum NatHERS star ratings for new homes are prescribed by the National Construction Code (NCC 2019). Since 2010, the minimum requirements for new housing in Australia has generally been to achieve 6 stars (out of a possible 10), based on the annual thermal energy demand per square metre of floor area. While the NCC requirements are developed at national level, they are administered by the states and territories, leading to some variation in minimum performance requirements.

While the energy performance of new houses can be estimated prior to construction, researchers have found 'underperformance' (i.e. higher energy consumption) during occupation. Eon, Murphy et al. (2016) documented a 33 per cent variance between the energy consumption of 6star houses, that is, over- or under-predicted energy consumption during the design phase. This magnitude of variance can negate the energy-saving benefits of following advice regarding orientation of the dwelling and other energy-efficiency aspects of design.

The NCC also regulates lighting efficiency for new homes, with a current transition underway to highly efficient LED lighting and the phasing out of inefficient incandescent and halogen lamps. The efficiency of heating, cooling and hot-water appliances—which are usually provided in housing—are also factors that determine energy consumption of a home. Consumer information on the efficiency of gas-fuelled space heaters and hot-water systems is available through the Gas Energy Rating label developed by the gas industry (see energyrating.gov.au). A federal energy rating system covers the efficiency of portable electric devices and whitegoods, such as televisions, computers, washers and dryers, dishwashers, refrigeration appliances and portable air conditioners.

2.2.4 What is the impact of dwelling quality on energy hardship for renters?

It is important to understand the impact of dwelling quality on energy hardship not only for renters of social housing but also for other renters, as there is a consensus in the literature that rental properties, in general, tend to be of poorer quality than other dwellings, particularly in terms of energy efficiency (ACCC 2018; ACOSS, BSL and The Climate Institute 2017; Energy Consult 2009; Liu and Judd 2016; Nicholls, McCann et al. 2017b; Pitt and Sherry 2014; QCOSS 2017).

Several factors must be taken into account when considering the impact of dwelling quality on energy hardship for renters in Australia: dwelling energy efficiency is best considered at the design stage (Poor, Thorpe et al. 2018); apartments have formed a higher percentage of new dwellings in recent years (Rosewall and Shoory 2017); and the vast majority of rental housing is already constructed. Studies in Victoria have found that, while four out of ten public housing dwellings are less than 40 years old, detailed housing conditions data is unavailable, making it difficult to quantify the true prevalence of poor material condition across the public housing stock (Victorian Auditor General 2017). Another Victorian-based study found a higher prevalence of perceived difficulty in heating their home among renters (50%) compared to owner-occupiers (30%) (Energy Consult 2009), with tenants citing draughtiness and lack of insulation. Research indicates that, independent of the type of housing, undertaking even small retrofitting works—such as draught-sealing, installing ceiling fans, and making internal changes to prevent heating and cooling of service spaces—can significantly reduce energy costs for tenants while retaining a comparable level of comfort (Matthew and Leardini 2017).

The use of insulation may reduce energy consumption and improve thermal comfort, as it reduces temperature differentials within a space. Insulation in dwellings may be more prevalent in colder climates than in warmer climates, and in owner-occupied properties than in rental properties, particularly those at the lower-cost end of the market (Liu and Judd 2016). A Western Australian survey in 2011–12 found that only 40 per cent of rental homes had insulation (Cornwell, Hejazi et al. 2016). Studies in Victoria found a significant proportion (ranging from 17% to 45%) of public housing is without ceiling insulation (BSL and Department of Industry, Science, Energy and Resources 2016; CAV 2016; VCOSS 2010). The figures are similar in the private sector (estimated at between 15 and 42% in Victoria) (BSL and Department of Industry, Science, Energy and Resources 2016; CAV 2016; VCOSS 2010); though, in Queensland, the figure is higher, at 50 per cent (QCOSS 2017). An Australian Bureau of Statistics (ABS) survey found that approximately 40 per cent of tenants did not know whether their dwelling had any insulation (ABS 2010).

There is limited research documenting the detailed through-life (or lifetime) costs and benefits of delivering retrofit in low-income rental housing, either in Australia or internationally. An early study of a pilot program to help ten low-income rental properties undertake retrofitting (Just Change) found that by utilising a range of financial government programs, households could reduce the net cost of retrofitting a number of energy-efficient measures to just \$83 (Dillon, Learmonth et al. 2009). The report found there were significantly different outcomes across households, with four of the five dwellings that were monitored in detail having *higher* energy consumption post-retrofit.

The Cooperative Research Centre for Low Carbon Living undertook research on retrofit of residential buildings, producing a broad guide on the different retrofit measures suitable in different climate zones and for different types of housing (Whitehouse, Osmond et al. 2019). While not specifically focussed on rental properties, the guide used a rating of 1–3 to quantify the impact of retrofit measures on home comfort, installation difficulty, upfront costs and energy savings. The analysis did not discuss through-life costs and benefits, but did identify several typical low-cost, easy-to-install retrofit options common to most climate zones (e.g. LED lights, draughtproofing and insulation) that had low to medium energy savings. Retrofit strategies with higher energy savings (e.g. air conditioning upgrades, adding solar PVs and window replacements) were typically more climate dependent and had far higher capital costs—and thus longer payback periods (Whitehouse, Osmond et al. 2019).

Energy-efficient systems and appliances

Other than a limited number studies in Victoria, and the evaluations undertaken as part of the Australian Government's LIEEP, there is little known about the energy efficiency of household systems and appliances in Australia and their prevalence across the different housing tenures. Liu and Judd (2016), however, found that the upfront costs of more efficient devices were prohibitive for low-income households and that this group often relied on donated (less efficient) second-hand goods. VCOSS (2010) estimated that one in ten properties offered for rent in Victoria has no fixed heating system, which may necessitate the use of portable electric heaters (VCOSS 2010), resulting in an increased cost of approximately \$150 per year when compared to homes using more efficient appliances (VCOSS 2010). Another study found that private renters (66%) and public renters (62%) are less likely than the average home owner (77%) to have an air conditioner, and have fewer rooms that could be cooled mechanically (Colmar Brunton 2018).

Nicholls, McCann et al. (2017a; 2017b) called for improved access to home air conditioning for elderly and frail residents, and people with chronic conditions, in order to ameliorate the impact of extreme heat. They noted that heat-vulnerable households include those in public and private rental. Rental properties are more likely to have evaporative cooling than more efficient reverse-cycle/heat pump cooling systems, with the latter more prevalent in owner-occupied dwellings (Energy Consult 2009). Rental properties are also less likely to have central heating than owner-occupied homes (Energy Consult 2009).

In metropolitan areas, private renters are more likely to report the use of reticulated gas than public renters or home owners (Colmar Brunton 2018). Liquefied petroleum gas (LPG) use was more common in regional areas and particularly in rented homes in these areas (Energy Consult 2009). Dual-fuel households are at higher risk of energy hardship or compromising on heating (Nance 2013). The use of LPG may also disadvantage low-income households in Queensland, where this fuel type is not covered by energy concessions (QCOSS 2017).

The majority of participants in Liu and Judd's (2016) study reported using electric cooktops and microwave ovens for cooking, although some participants used their gas-fired barbecues as they perceived gas to be a cheaper cooking fuel. Energy-efficient light bulbs are present in many low-income households due to energy-assistance packs and their relatively low running costs (Liu and Judd 2016). It is estimated that the number of inefficient halogen light bulbs has been reduced to less than four per dwelling in 85 per cent of all rental homes in Victoria (BSL and Department of Industry, Science, Energy and Resources 2016). In 2010, almost 20 per cent of surveyed rental properties in Melbourne and Geelong had an electric hot-water system, which at the time would have increased costs by over \$300 per year compared to a 2-star gas water-heating system (VCOSS 2010). Liu and Judd (2016) reported that some low-income householders were concerned about inefficient hot-water systems, with some limiting use or resorting to cooler temperature settings to save energy.

Solar photovoltaics and solar hot water

Electricity generation by solar PV panels has been shown to reduce household electricity costs by varying degrees (ACOSS, BSL and ANU CSRM 2018). A recent study of energy stress in Australia found that access to solar panels reduced household electricity costs by about \$400 a year (ACOSS, BSL and ANU CSRM 2018). The research also found that access to solar panels is unevenly distributed across the five income quintiles. However, renters seem to be disadvantaged in their access to this technology. In one survey, while not necessarily fully representative, private and public renters were shown to be under-represented among households with solar panels, with only 2 per cent of renters having access to solar PV, compared with 20 per cent of all households (Colmar Brunton 2018: 58).

Another study found that, compared to owner-occupiers, renters in Queensland are one tenth as likely to have solar panels (QCOSS 2017). In Western Australia, renters are one fifth as likely as owner-occupiers to have solar PV systems (Cornwell, Hejazi et al. 2016). Solar panel installations may be more common in public housing in the Northern Territory than elsewhere, as the geographical isolation makes microgeneration the most feasible option of electricity supply (Liu and Judd 2017).

Liu and Judd (2016) found that while tenants often desire solar PV panels, their landlords generally show no interest or support. The same study reported that renters may not derive full benefits from solar microgeneration because feed-in tariffs are usually paid to the landlord. Benefits of solar PV to renters are also dependent on the time of electricity use; i.e., due to peak rates or high feed-in tariffs (early adopters benefited from much high feed-in tariffs than currently offered, often double or triple the amount charged per kW/hr drawn from the grid) (ACOSS, BSL and The Climate Institute 2017).

Colmar Brunton (2018) found that both private and public rental groups reported less-than-average access to gas-boostered solar hot-water heaters. This concurs with the findings of unequal access to solar hot water in a recent Queensland survey (QCOSS 2017). Research from Victoria similarly found that solar hot-water systems were much more likely to be installed in owner-occupied homes than in rented ones (Energy Consult 2009).

2.2.5 Initiatives targeting renters and landlords

The review of grey literature found numerous interventions and initiatives at state and local-government levels that specifically target renters or rental properties. The large majority of the initiatives are primarily designed to ease the burden of energy costs of rental households. Appendix 1 summarises the initiatives designed to reduce costs or increase payments to rental households across each state or territory. Some of these initiatives are available to all households on low incomes, while others are specifically targeted toward renters.

The review also identified many initiatives targeting a reduction in energy use for households, with most targeting low-income households generally and others targeting renters of public or community housing. A higher number of initiatives have been, or are being, implemented in Victoria than in other jurisdictions, which suggests that Victoria is leading the other states and territories in addressing energy hardship for renters.

A number of the identified initiatives are not current but were trials funded by the Australian Government's LIEEP, which ran from 2013 to 2016. Final reports of all twenty projects funded under LIEEP are available (see Department of Industry, Science, Energy and Resources 2020) and, where relevant, their findings are included in Appendix 1. The range of LIEEP initiatives includes:

- provision of information to raise awareness of opportunities to reduce energy use
- energy-efficiency improvements, such as replacing lighting with LEDs, draught-sealing and improving insulation
- mechanisms to increase renter access to solar PV—for example, by providing access to community-owned renewable energy systems, or installing solar PV on social housing.

For the LIEEP projects that were evaluated, implementation of energy-efficiency improvements were found to provide variable reductions in household energy use. Replacement of hot-water systems and air conditioners show the greatest reduction in energy use. In terms of retrofits that improve thermal comfort, in southern states such as Victoria, improving insulation can increase winter temperatures in homes by 1–2 degrees Celsius (benefits to summer conditions not reported) (Willand, Maller et al. 2019). In the tropics, installing ceiling fans is more beneficial than insulating (Steinborner, Michael et al. 2016).

Evaluation of some initiatives found that helping households to understand which features of their dwelling contribute to their energy consumption, and how their patterns of energy use also contribute, can assist the household to make decisions that reduce energy consumption without compromising thermal comfort. Initiatives that considered Aboriginal households found that there are significant cultural barriers to assisting these households to reduce their energy use. Some LIEEP projects specifically targeted these groups and found that including Aboriginal people in the teams involved in preparing and delivering information, conducting home energy assessments or implementing energy-efficiency improvements to dwellings, could assisted in overcoming cultural barriers (see Indigenous Essential Services 2016; Bedggood, Farquharson et al. 2016). Other than the initiatives funded by the LIEEP, very few programs have been formally evaluated.

A review of the initiatives listed in Appendix 1 shows that schemes targeting landlords mainly address the need to provide information about the energy performance of the dwelling to prospective tenants (such as through the mandatory energy-efficiency disclosure policy for rental housing in the ACT), or seek to overcome issues of 'split incentives' that prevent landlords from undertaking improvements that provide them with no immediate or direct financial benefit.¹ Strategies designed to prompt landlord action predominantly aim to encourage the installation of solar PV systems.

2.2.6 Policy recommendations

This section focusses on the suggestions for policy that were found in the literature reviewed. A summary of these recommendations is provided in Table 2. While these recommendations are presented as separate policy initiatives, key stakeholders acknowledge that an effective policy strategy should take a comprehensive approach (Acil Allen 2018; ACOSS and BSL 2019; ACOSS, BSL and The Climate Institute 2017; Pitt and Sherry 2014; Wrigley and Crawford 2015).

¹ Split incentives occur when 'those responsible for paying energy bills (the tenant) are not the same entity as those making the capital investment decisions (the landlord or building owner). In these circumstances, the landlord may not be inclined to make the necessary upgrades to building services when the benefits associated with the resulting energy savings accrue to the tenant' (HVAC HESS 2013: 1).

Table 2: Summary of policy recommendations arising from literature review

Strategy	Details	Source/s
Improve the energy literacy and practices of householders	Resources to advise on energy costs and thermal performance of homes	Acil Allen 2018; QCOSS 2017
Design and material improvement of new houses	Multi-year evaluation of four new two-bedroom, single-storey, sustainably designed units	Moore, Strenger et al. 2015
Access to solar PV	Third-party and community-owned solar PV systems	Chester, Elliot et al. 2018; Liu and Judd 2017
	On-billing scheme	Acil Allen 2018
	Solar PV on all social housing buildings	ACOSS, BSL and The Climate Institute 2017
Tax reforms	Incentives to improve energy efficiency	Wrigley and Crawford 2015
	Negative gearing dependent on energy-efficiency improvements	Liu and Judd 2017
	Land tax or council rate reductions for improvements	Acil Allen 2018
Tenancy regulations	Clear communication	QCOSS 2017
Mandatory disclosure of energy efficiency	At point of lease, energy efficiency of the dwelling translated into costs and benchmarked	ACOSS, BSL and ANU CSRM 2018; COAG Energy Council 2015; Pitt and Sherry 2014; QCOSS 2017
Minimum energy-efficiency standards for rented dwellings	Supported by tax incentives and access to solar energy	Acil Allen 2018; ACOSS, BSL and ANU CSRM 2018; BSL and Department of Industry, Science, Energy and Resources 2016; Pitt and Sherry 2014; QCOSS 2017
'Fit for habitation' housing standards for rental properties	Includes minimum energy-efficiency standards; requires audits	ACOSS, BSL and ANU CSRM 2018; QCOSS 2017; Urmee, Thoo et al. 2012
Amend tenancy legislation	To enable thermal quality of dwelling improvements by tenant	ACOSS, BSL and ANU CSRM 2018; QCOSS 2017; VCOSS 2018
Tenancy information	Include information on property characteristics that affect energy and thermal performance	QCOSS 2017
Protection from rent increases	Related to energy efficiency improvements	ACOSS and BSL 2019; ACOSS, BSL and ANU CSRM 2018
Protection and education for consumers in embedded energy networks	Consumers invest in a grid-connected electricity meter and buy energy from sources outside the network; information on advantages/disadvantages	Acil Allen 2018; QCOSS 2017
Long-term leases	Protects renters who make energy-efficiency improvements, including providing longer pay-back periods or contractual arrangements	QCOSS 2017; Wrigley and Crawford 2015
Health prevention measures	Incentives for dwelling quality improvements for temperature-sensitive households	ACCC 2018; ACOSS, BSL and The Climate Institute 2017; Nicholls, McCann et al. 2017b
Energy obligations extension	From retailers to property agents and banks	ACOSS, BSL and ANU CSRM 2018
Energy Performance Contracts (EPCs)	Agreements between independent energy-efficiency improvement providers, who provide the upfront costs, and householders	Acil Allen 2018
Landlord penalties	On underperforming properties (capability assessed)	Acil Allen 2018

Strategy	Details	Source/s
Green leases (similar to EPCs)	Landlord provides funds and receives benefits (co-design)	Liu and Judd 2017; Wrigley and Crawford 2015
Government investment in public housing	Targeting dwellings with poor performance; public-private partnerships (PPPs) for funding; optimising energy efficiency with solar PV (8star target)	Acil Allen 2018; ACOSS, BSL and The Climate Institute 2017; CEFC 2016; Moore, Strenger et al. 2015
Self-funded investment by social housing tenants	Information and control as well as incentives, rebates or grants to undertake own improvements	QCOSS 2017
Income support	Raise Commonwealth Rent Assistance (CRA) by 30 percentage points (equivalent to \$20 a week) for Newstart recipients living alone	ACOSS and BSL 2019
Improve practices of property management agencies	Training in use of assessment tools and livability checklists; enforcement of quality of service and professional conduct regulations	Acil Allen 2018; Pitt and Sherry 2014; QCOSS 2017

2.3 Policy development implications

Three key implications arise from the review of research and policy. There is a need for:

- **scaling up:** more evaluation of promising programs and projects to inform systemic, scaled-up policy to be developed and implemented
- **specific focus:** policy designed to address the issues facing rental affordability and to avoid regressive effects
- **integration:** comprehensive, cross-government, cross-departmental, cross-jurisdictional approaches.

Scaling up

As indicated in the discussion above, current programs and projects aimed at addressing renter energy affordability are mainly small in scale and could be described as being in trial phases. Such projects face a particular set of complexities in that they are relatively challenging to publicise and upscale. Many promising initiatives are individually tailored, and therefore relatively high cost to administer—as such, they are better seen as experiments and projects rather than programs or policies in their own right. The contingent, experimental nature of these projects is, of course, necessary, but a key implication for policy is that they be recognised as such. Policy should seek to build a protected niche within which such experiments can take place and be formally evaluated. Systematic evaluation of current initiatives would be a necessary part of this niche development, allowing a selection environment to be established wherein policy innovation could be undertaken and upscaling made possible.

There are precedents internationally for such efforts to upscale and systematically engage with niche development to deliver widescale energy-efficiency retrofits in fuel-poor households. For example, in the UK, the Warm Front grants program was designed to help vulnerable households, including those in fuel poverty (i.e. experiencing energy hardship), to benefit from energy-efficiency improvements such as home heating and loft insulation measures. The more recent Energy Company Obligation program, also in the UK, requires suppliers to deliver energy-efficiency measures to domestic premises. In the European Union, the development and roll-out of energy poverty metrics, and centres of coordination of research, knowledge, policy and programs (e.g. The EU Energy Poverty Observatory), provide another example of niche development, support and steering.

Specific focus

Tenure-blind programs funded from energy utility obligations are often regressive. As indicated in Section 1.2, and confirmed by the policy review, relatively few interventions are targeted at renter-specific issues. Known energy-affordability issues affecting renters include market failures such as:

- principal-agent/split incentive problems
- information asymmetry problems (e.g. withholding/manipulation of information by landlords/agents)
- agency/power imbalances, including with key intermediary roles (e.g. property agents)
- financial/market-entry constraints
- lack of protection of ongoing rental rates and tenure conditions following the advent of energy-efficiency retrofits
- poor knowledge, access and capabilities of renters on energy efficiency/pricing options.

While the number of renter-focussed schemes is growing, program design and targeting to address these specific issues is still nascent. For example, in private rental, property managers are key intermediaries, but they are rarely targeted by such schemes. Moreover, targeted help for renters in hardship is complex because it is a largely hidden, dynamic and intangible problem. Beyond detectable cases prompted by clear crises, such as non-payment of bills, there are many cases more akin to the so-called 'boiling frog syndrome', where conditions of hardship develop or exacerbate over time. We can speculate that the more confident and capable renters experiencing increasing energy hardship might be the least accessible, since they will try to make do and may even seek to conceal their efforts and hardship, even when they are unable to prevent indoor temperatures from becoming harmful to health. This issue underlines the need for policy integration across housing, energy affordability and health.

Integration

Unsurprisingly, policy integration is a problem when it comes to addressing energy hardship. Jurisdictional responsibilities are spread across three tiers of government, and the complexity of working across health, welfare, energy and housing portfolios is challenging. Nonetheless, there are now some examples of upgrade programs seeking energy-efficiency outcomes that are also concerned with associated chronic health needs (e.g. the Victorian Healthy Homes Program).

The implication for policy is that housing must be central to policy development in this area, to ensure that key intermediaries (such as social care services, property managers, etc.) are included in policy innovation. There is already widespread acknowledgement of the need for more integrated, comprehensive, simple, accessible and targeted support. However, there is currently no 'central command' structure or policy-coordinating point. Similarly, at project level, there is an existing network of innovators, but it lacks a systematic structure and an intermediary go-to point that can coordinate engagement across the sector.

In order for a systematic, sectoral approach to effectively deliver on the multiple health, environmental and social dimensions of renter energy affordability, a policy roadmap is required that encompasses methodical learning from experiments, niche management, and a long-run path to mandatory disclosure of energy efficiency, targeted policy and minimum performance standards. Long-term policy goals would allow landlords to factor housing upgrades into investment planning. All in all, such a route would require a bipartisan approach.

3. Data analysis: the AHCD and HEET interviews

- **This analysis of secondary data suggests that there is measurable dissatisfaction among Australian renters with the thermal performance of their home. Many are unable to keep warm in winter or cool in summer.**
- **There is a degree of ambiguity and uncertainty around renter rights across both the social and private rental sectors.**
- **There appear to be substantial differences in the experiences of private rental tenants compared to social housing tenants.**
- **Within rented social housing, the qualitative data suggests that tenant-requested improvements are likely to be limited to addressing the minimum quality of the home. Social renters are also broadly reticent to request improvements.**
- **Private tenants are more likely than social housing tenants to feel entitled to a basic level of quality of their rental home.**

This chapter presents insights from two recent research projects: the Australian Housing Conditions Dataset (AHCD) and the Housing Energy Efficiency Transitions (HEET) project. The AHCD contains information on the housing conditions of Australian households, collected in 2016, enabling in-depth examination of a range of housing and urban issues (see, for example, Daniel, Baker et al. 2019). The HEET project started in 2019 and focusses on questions around upscaling and equity of residential energy retrofits. It comprises several research components, examining tenants' lived experiences of home improvements, the conditions that shape retrofit services, and the influence of energy policies on energy equity (see, for example, Willand, Moore et al. 2020). The following sections present analysis of the two datasets, focussing on the housing conditions of rental tenants and their experiences of energy hardship.

3.1 The Australian Housing Conditions Dataset (AHCD)

The AHCD contains housing, socio-demographic and health-related information for 4,501 households across South Australia, Victoria and NSW (Baker, Daniel et al. 2018). The sample, surveyed via telephone in 2016, included 326 private renters and 133 social housing renters; the remainder comprised outright owners (2,825), mortgage holders (1,129) and 'other' (88). Summary statistics for a selection of socio-demographic and housing characteristics are presented, by tenure, in Appendix 2. An overview of relevant findings is provided below.

The proportion of residents in social rental housing who were female (72%) was found to be much higher than across the other main tenures. Both public renters and outright owners tended to be in the older age groups, while private renters tended to be younger than the broader population, and mortgage holders tended to be largely in their mid-working years. The majority of public renters surveyed were lone person (53%) or single-parent households (16%). The proportion of lone person households was similarly high in the private rental sector (35%), but there was also a relatively high proportion of couples with children (24%). Owned-outright and mortgaged tenures were predominantly couple households, with or without children.

As might be expected, household income for public renters was relatively low. More moderate income levels were evident among outright owners and private renters, while mortgage holders had the highest household income levels. A similar proportion of public renters, private renters and mortgage holders had experienced financial strain in the past 12 months (20–25%), but the proportion was much lower for outright owners (6%). In regard to the financial strain items relevant to energy hardship: 11 per cent of private renters and 11 per cent of public renters were not able to pay their energy bills on time, while a smaller proportion were unable to adequately heat their home (3–4%). The proportion of renters experiencing these problems was far higher than that of owner-occupiers.

Overall, private renters proved to be much more mobile than residents within the other tenures. Both public and private renters tended to reside in slightly newer homes than outright owners or mortgage holders. While separate (detached) houses were found to make up the vast majority of owner-occupied homes, rented dwellings are much more diverse in their typology: between a fifth and a quarter of all renters live in flats or apartments, and around a third of public renters live in semi-detached houses.

The construction of respondents' houses did not differ greatly across tenures, although public rentals were slightly more likely to have tiled roofs (rather than metal or concrete), and masonry or fibro walls (rather than timber or metal). However, the proportion of respondents reporting major building problems was higher for renters than for owner-occupiers across almost every category (e.g. cracking, mould, rising damp). These trends are reflected in respondents' overall satisfaction with their dwellings: renters are less likely to be 'very satisfied' than owner-occupiers (although satisfaction across all tenures is reasonably high).

Across several measures of indoor environmental quality, both public and private renters expressed dissatisfaction with the thermal performance of their home. For example, 18 per cent of public renters, and 14 per cent of private renters, were unable to keep sufficiently warm in winter. Residents living in the rental sector also faced problems with keeping cool in summer, though to a lesser degree. The amount of natural light indoors was adequate for most respondents, although a slightly higher proportion of private renters and mortgage holders reported inadequate indoor natural light.

To understand how issues of energy performance and hardship might intersect with other forms of disadvantage, we cross-tabulated residents' ability to keep warm in winter, keep cool in summer, pay energy bills and adequately heat their home, with their self-assessed general health. Respondents living in public rental properties and reporting the inability to keep warm or cool in their home were much more likely to also report 'fair' or 'poor' health (see Table A2.2). However, these patterns were not as apparent in the cross-tabulation of responses from private rental households (see Table A2.3). This result is, perhaps, unsurprising given that allocation of public rental tenancies is predominantly targeted toward people with high and complex needs, often involving multiple forms of disadvantage.

3.2 The Housing Energy Efficiency Transitions (HEET) interviews

In this section we present analysis of interviews with low-income renter households from the ARC-funded HEET project. The HEET interviews explored households' lived experiences of their housing quality, including how they undertook, or requested, maintenance and retrofit activities. The group of interviews considered here is a subset of a larger data set that included owner-occupiers. At the time of analysis, there were 10 households that were clearly, or self-identified as being, low-income households and were renters in either social housing (including public housing and community housing) or private rental. They comprised a mix of household types, from singles through to families with children. The analysis presented here summarises the experiences of the tenants in regards to retrofits of their home, including their perceptions of the quality of their home and their negotiations of home improvements with their landlords. All private renters were located in metropolitan Melbourne (pseudonyms starting with M), while the majority of social renters lived in regional Victoria (pseudonyms starting with LT).

3.2.1 Social rental

A key difference between the private and social renter cohorts was the typical response from the social housing tenants of feeling 'lucky' to have a roof over their head. The social housing tenants reported that their houses were either reasonably new when they moved in, or had been significantly refreshed (e.g. painted, fitted with new appliances) or upgraded (e.g. flooring replaced) prior to them moving in—similar to the findings of the AHCD analysis, above. This is not unexpected, as social or public housing providers, like the Department of Health and Human Services (DHHS), generally take the opportunity at the change of tenants to undertake key works on properties to ensure they meet DHHS maintenance standards.

This regular refreshing or maintenance of social housing was reflected in the responses of social housing tenants, who spoke less of improvements they required or had asked for in comparison to private rental tenants. However, a range of tenure lengths was represented among the social housing tenants, and one household (LT6) had been in their home for just over 10 years and was starting to see some decline in the quality of their property.

A range of dynamics in the relationships between social rental tenants and social housing providers was evident. Some social housing tenants reported that they had a good relationship with their housing provider, while others were quite critical of their housing office's services. This dissatisfaction may have tainted their view of their home. However, all the social housing tenants said they felt comfortable to report any issues they had with the quality of their dwelling to their housing provider. This was particularly true for public housing tenants, as they felt they were 'in the housing for life' and so were not afraid that asking for something would impact their rent or result in them being moved on.

All of the social rental tenants made clear that their housing providers only responded to requests relating to the minimum quality of the home. Several social housing tenants said they had been told that improvements they had requested, such as replacing carpet or upgrading air-conditioning systems, were rejected because there were other properties in the housing provider's stock that were in a worse state and required maintenance or upgrading first. These households were frustrated by this, but showed a degree of understanding given their gratefulness to even have a secure home. As one participant (LT16) put it: 'There's worse houses out there, so I should be grateful. I am.'

In one case, a social housing tenant (M12) was advised that they could move into another home if they wanted to, in lieu of getting the requested upgrades. However, they declined the offer, figuring it was better to stay in the house they knew than to take a risk on another property—their concern was partly about the unknown aspects of the alternative dwelling, but also about the area where it was located. So, for some social housing tenants, it appears there was a sense of having to 'trade off'; they were not willing to challenge their housing provider too much, even though they felt comfortable asking for improvements to do with minimum quality of the home. It is unclear how these tenants decided what constituted 'minimum quality', but there was a clear line about what they would ask for and what they would not.

Three of the five social housing tenants interviewed (LT5, LT6, LT16) had requested more significant changes from their housing providers around the improvement, replacement or addition of space-conditioning systems for heating and cooling. For all three, their request was declined, even though at least one (LT5) had suggested the current system was impacting on their child's health. In fact, that household spoke about it being so cold in winter they would sleep with their child on the couch in the living room as that was where the most efficient heater was in the house.

Interviewer: Did you talk to them about the heating in the bedrooms at all?

LT6: Oh, yeah. I've told them about it, but no. Nothing, they won't do it.

The response of those landlords was in accordance with the DHHS housing standards guidelines for new and existing homes, which specify one heater per dwelling, in the living area, as the only space-conditioning appliance required, and discourage installation of central heating (DHHS 2018). The guidelines also state that air conditioners specifically for cooling need only be provided on medical grounds.

O social housing tenant (M12) did have their heater replaced, following their housing provider's annual check of the home's gas heater. The heater was found to be leaking high levels of carbon monoxide and was subsequently replaced. However, the pollution had not been noticed by the tenant themselves, nor had they requested a replacement.

A number of social housing tenants spoke of undertaking improvements themselves, such as buying and installing blinds or curtains that were not included in the house, even when this was not permitted by the housing provider. (It is not clear whether the installation of blinds/curtains was to improve the energy efficiency of the homes or for privacy.)

I'm not allowed to make changes, so I have to go through them [housing provider]. But when I first came here, there was no curtains, no blinds; you have to do it all yourself. (LT16)

One tenant (LT16) reported putting in some LEDs themselves. Other than this example, there was little mention of any upgrades tenants had undertaken, or requested, in relation to energy efficiency.

One tenant (LT2) had accessed a local energy relief grant to get around \$4,000 to replace their hot-water system and put external blinds on their property. Another tenant (LT6) spoke of being aware of this scheme but said they did not bother looking into it further—even though it would have given them a new, efficient air conditioner—as it would have required a lot of paperwork, including getting a letter from their doctor supporting the application. This suggests that limited competence in navigating administrative processes may lead to avoidable shortcomings in housing quality.

Overall, there was little evidence to suggest that the social housing tenants interviewed had more than a basic knowledge of energy efficiency or sustainability. For example, all interviewees expressed concern about paying their energy bills, but none had asked for an upgrade to their property to help them manage this. In cases where tenants *had* requested upgrades to heating and cooling systems, the application had been motivated by a desire for better thermal comfort, rather than for energy efficiency.

3.2.2 Private rental

The private rental tenants surveyed had a quite different perspective on their housing. Rather than just feeling 'lucky' to have a home, as the social housing tenants did, the private rental tenants felt entitled to a certain quality of rental property. Unlike the social housing tenants, whose houses were refreshed prior to them moving in, the private rental tenants encountered a range of quality levels in their homes. However, most reported that their dwelling was in reasonable condition when they moved in. There were two distinct groups within the private rental tenants: those who had a good relationship with their landlord and, thus, felt comfortable asking for things to be upgraded or done (M24, M39); and those who did not have a good relationship with their landlord, which led to fewer requests for maintenance or upgrades and an overall lower quality of home (M19, M26, M27).

Only one of the five private rental tenants (M39) said they had not had to ask the landlord for any upgrades to their home (although they had only been in the property for about 18 months). However, they had installed a low-flow showerhead themselves, and were looking to put in some smart lighting to be controlled through their Google Home system. They spoke about wanting a 'smart home' and the benefits they felt a digitally connected home could bring in terms of using appliances more efficiently. They used smart technology (including apps) to conserve and manage energy, and as a way to derive a sense of continuity as homemakers (countering the constant mobility of renting). They had rented previously and, although they had not had to ask their landlord for anything in this current rental, their experience was that generally landlords do not care about their tenants. In the past they had found that the only way to get things fixed, replaced or upgraded was to threaten to take the landlord to the Victorian Civil and Administrative Tribunal (VCAT).

Three of the private rental tenants (M19, M26, M27) had poor relationships with their landlords and had consistently had requests for improvements refused, except when the request was interpreted by the landlord as addressing minimum housing standards (e.g. fixing a broken hot-water system). The understanding of 'minimum standard' appeared to vary between landlords (i.e. was not based on formal guidelines). Tenants felt that landlords were more focussed on the economics of solutions rather than on improving livability.

For example, one private rental tenant (M26) wanted a flyscreen security door installed to help with ventilation, as well as external blinds for shading. Their request was declined because their landlord felt that undertaking the work would set a precedent, meaning they would have to make the same upgrades to all their rental properties in that development. The tenant was told they could make the changes themselves; however, they did not have the money to do so. Without the requested improvements, the house continued to get very hot and at times the kitchen was almost unusable during the late afternoon. As their landlord built homes specifically to rent out, the tenant felt that the landlord prioritised maximising profit over the wellbeing of their tenants. It should be noted that this household had come from a previous rental property, where they had been for more than 10 years, and where they had enjoyed almost free rein to modify the dwelling with the permission of the landlord. The tenant stated that they had even been able to 'knock down walls' (i.e. make structural changes to the home). Therefore, the tenant's perception of their control over and ability to upgrade their rental home had significantly changed with the latest move (despite their current financial restraints limiting their ability to independently make improvements).

Well, I've never before lived in a place that I had so little control over what I could do. That has been the most difficult. The inability to hang art. The inability to have a verandah built or to dig up the imitation grass. So, we all find that frustrating ... And this style of reverse-cycle air conditioning with heating, none of us like ... In general, it's the lack of control that you have in a rental property, because even though we rented for 10 years [previously] ... we had total control of what we could do. We could knock down walls, put up walls, hang things, change things. We painted. We changed carpets. We put blinds up. That situation was very different to this, where everything you have to get permission for. (M26)

Another tenant with a poor relationship with their landlord (M27) described a time when they asked for the faulty heating system to be fixed. The request was refused as the heating had reportedly been fixed the year prior. The following week, the rent was put up by \$20 per week, which the tenant felt sure was linked to their request for the repair of the heater. Since then, they have refrained from asking for any work, unless it relates to what they regard as minimum standards. However, even some of those requests have been refused: for example, replacement of the rangehood light. This household was engaged with sustainable living practices and had had an energy assessment completed when they moved into the property. Following this, they had undertaken draughtproofing themselves and added second-hand awnings to some of the windows. However, they were conscious that this was adding value to a home which was not theirs.

And when you're renting, you don't want to put anything permanent in the house. Even putting the awnings up, the external awnings, it's kind of like, 'Oh, do we take them down when we leave?' And we're still a bit tempted. But at the same time you want the next people who live in here ... they're going to be just as hot. So, yeah. You might as well leave them up. (M27)

This concern around value-adding was raised by other private renters as well. For example, one tenant (M26) said they did not want to increase the value of 'someone else's house', especially as they were uncertain how long they could, or would, stay in the property. In another case (M27), a strained relationship with a 'frugal' landlord had prompted a shift in the tenant's priorities in regards to their choice of home. The tenant was tired of renting, due to the tenuous relationships with landlords, increasing rents and cost of living. In response, they were planning to shortly downsize to a tiny house on wheels in rural NSW. That is, they chose to compromise size of dwelling and proximity to a major city centre for better ontological security and control over their home environment.

We haven't [asked him for energy-efficiency upgrades]: he's rather frugal. So, for example, when we moved in, the light on the rangehood was broken. On the condition report, it said it was working. So, we're like, 'Oh, could we get that fixed? It'd be nice to have fixed.' He's like, 'Oh, does the fan work?' Like, 'Yeah.' He's like, 'Maybe the light will start working again then.' Like, 'Yeah, no.' Like, 'Oh.' He just sort of decided that that was not something that was worth fixing. So, if [he refuses to do] something so small, he's not going to put insulation in the ceiling ... This is our fifth rental property in 10 years, living in Melbourne. And yeah, I've only encountered extremely frugal landlords. It's their investment, I suppose. (M27)

Another private tenant (M19) had had some maintenance work undertaken by the landlord but had the perception that the landlord would say no to any larger jobs. The tenant had previously had a back-and-forth discussion with the landlord around the need to fix or replace a flyscreen—the tenant claimed it was broken but the landlord maintained it was fine. The tenant also reported issues with their thermal comfort.

I haven't made any changes, but I've requested changes. I requested [an external] blind to go up here, for the afternoon [sun]. I've got [an internal] blind, but I don't want to drill into the house because it's not my house. I don't know the laws around that ... This house gets really chilly, and I often sit with two coats on, blanket over my legs. I think to myself, my rent's gone up so much now. (M19)

The same tenant believed that certain sustainability features, like a rainwater tank, might help with the issue of the backyard flooding during storm events. However, they had not asked the landlord for this due to their previous negative experiences. The tenant had, however, recently used the Victorian Government's Energy Compare website to find a better energy deal and had been impressed with the savings they had achieved just by switching providers.

I just changed my electricity and gas provider. I was with [name of retailer] for gas and electricity. I was wondering, Why are my bills so high, it's only May? I went online and went to the government website about changing electricity and gas providers ... I just received my first bill for gas and electricity, and it's \$100 cheaper. Can't believe that. That's amazing. (M19)

There was only one private rental household (M24) who had a strong relationship with their landlord in the sense that their requests were heeded. This household had made numerous requests for improvements to their home, most of which had been approved—for example, the addition of a dishwasher, replacement of an old inefficient oven, addition of flyscreens, and installation of a bike shed.

We wanted a flyscreen on the front door because this place doesn't have air conditioning, and so on hot summer days it is good to have the door open and have a bit of ventilation. And so we asked for one and we got one. With any issues with the house, we deal exclusively with a landlord ... and he's been great ... When we moved in, he installed a bike shed. Everyone has a bike. It would just take up more space if we were parking our bikes in the hallway ... And so he's been good. I mean, in terms of a landlord experience, it's really quite an ideal experience. (M24)

The tenant reflected that the landlord was proactive and liked having proactive tenants. The landlord was quick to respond to requests and was happy for the tenants to undertake some additional works, such as adding shade cloth to key windows in summer to keep the heat out. The tenant had also looked into the Solar Homes scheme, through which the costs of a new solar PV system may be shared between a landlord and tenant. Even though they felt that the landlord would agree, they did not have the required capital themselves at the time.

Two other private rental tenants also spoke of being interested in the Solar Homes program. One tenant (M27), who reportedly had the necessary funds to participate in the scheme, decided not to approach their landlord about it, as they believed the landlord would decline to participate or would put their rent up. Their reluctance to approach the landlord was increased by their plan to soon move out of the property. The other tenant interested in solar microgeneration of electricity (M39) did not indicate whether they had the capital costs, but also assumed their landlord would not be interested. The quotes below demonstrate how these tenants were second-guessing their landlord's response to possible requests for home modifications, indicating the deep distrust of landlords among some private renters.

Well, I mean, there's some rental scheme in Moreland Council about [solar power]; you get your landlord to pay for it. And we just assumed that he'd jack up the rent. Or that he wouldn't be interested. (M27)

I know that there was a scheme with Moreland a few years ago, [and they] tried to convince landlords to do it, but I'm like, 'Yeah, but I mean, really?' If they're not paying the power bill, if they're not reaping the benefit directly, even with a discount or a rebate or that sort of thing, they're probably still unlikely to do it. (M39)

3.2.3 Reflections

Unsurprisingly, the most significant barrier reported by participants was the lack of control they had over changes they could personally make to their home, given their tenure arrangements. Both the private and social renter cohorts reported needing to get approval to undertake any changes or upgrades to their properties. For some, this was required for even the smallest changes, like adding hooks for picture frames, as well as for larger changes such as painting of rooms and replacement/addition of fixed appliances. Energy-efficiency interventions, when mentioned, also required landlord approval and action. There was uncertainty around rights among both private and social renters. Some renters undertook works themselves—such as draughtproofing, or adding external shade cloth or awnings—without asking for permission. They were conscious, however, that whatever work they did needed to be temporary or add value to the property.

Only two households identified themselves as being interested in and actively engaged with sustainable living practices. With regards to energy-efficiency improvements, these tenants were constrained with what they could do in their homes. Their perception was that landlords care about maximising the investment yields of their properties and that sustainability-focussed upgrades were not seen as smart investment decisions by the landlords. However, landlords were reported to be amenable to tenants spending their own money on these projects. Tenants, however, were not enthusiastic about investing in their rented properties given the insecurity of their tenure. The challenges described around the government's solar PV program, in which provision has been made for costs to be shared between landlords and private tenants, demonstrate that more work needs to be done with both landlords and tenants if such shared-funding programs are to gain traction.

3.3 Policy development implications

The AHCD and HEET analyses above find that there are numerous housing quality issues in the low-income rental space, for both private and social rental housing, which impact on energy hardship and quality of living, and which are distinct from issues faced by owner-occupiers or higher-income renters. The renter cohort contains some of the most vulnerable people in society, such as older women and single-parent households. While there has been some progress in recent years in terms of policies and programs to help support renters to undertake retrofit or quality improvements to their rental properties (with or without landlord participation), this support appears not to be well known by the low-income renter cohort—and, where it is known, there is suspicion that there will be some sort of negative outcome (e.g. increased rents). Subsidies that aim to promote energy improvements for homes and lower energy costs seem to reach tenants to a lesser extent than owner-occupiers. Rights for renters must be expanded to include basic housing quality and performance allowances, and access to no-cost retrofit schemes—for example, allowing tenants to put in curtains/blinds or LED light bulbs without needing permission.

Renters must also be made aware of what their rights are; currently there is significant confusion about what tenants are allowed, or not allowed, to do. While this information is accessible via tenant advocacy organisations, none of the interviewees reported engaging with such services. In addition, information about retrofit activities for rental properties—ranging from zero- or low-cost options (like sealing gaps and cracks) to higher-cost options (insulation, secondary glazing, replacement of heating and cooling systems, solar PV)—should be provided to both landlords and tenants. This information should include the support opportunities available in that particular area.

To help tenants and landlords understand the opportunities for retrofit, the use of an in-home sustainability or energy evaluation, such as that provided by the Residential Efficiency Scorecard in Victoria, could provide independent information about what could be improved and what the benefits could be. The cost of undertaking an evaluation could be claimed as a tax deduction or rebate if such landlords are able to demonstrate that improvements have been undertaken as per the evaluation recommendations.

A large number of landlords are 'mum and dad' investors who may only have one or two investment properties. To improve outcomes for both tenants and landlords, all landlords could be required to undergo basic property management training, covering elements of housing quality, sustainability, and relationship management. Improved protections around how and when rent rises can occur would provide more transparency around the possible impacts on rent if improvements are made to a dwelling.

4. Perspectives of key stakeholders: analysis of Panel and interview data

- **Energy hardship is more than just financial hardship. While income is a major driver, dwelling quality, energy efficiency, access to technology, and even local climate are also drivers.**
- **The multiple causes of energy hardship constitute a clear challenge to the targeting and design of intervention responses.**
- **There is a need for greater coordination of responses, scaling up, as well as evaluation of success.**
- **It is likely, in the current absence of robust or systematic data, that the scale of the energy hardship problem is larger than currently acknowledged.**
- **The involvement of a broader group of stakeholders (e.g. real-estate investors, banks, government health departments) in policy response is required.**

This component of the research brought together policy stakeholders, advocacy group representatives and frontline service providers in a series of invited panels and discussions. The aim was to explore and discuss existing and emerging issues around energy hardship, and to think creatively about potential solutions. Overarchingly, this component was structured around understanding: key governance challenges to uptake and implementation of energy interventions in Australia; emerging opportunities; how interventions might be better targeted to those at risk; and what the potential role is for government and non-government providers.

The first Project Panel meeting aimed to establish a basis and common understanding of the key issues involved, as well as identify particularly vulnerable cohorts. This Panel was followed by a series of focus group discussions and key informant interviews that focussed on gathering a breadth of perspectives in these areas as well as identifying potential solutions. The final Project Panel meeting consolidated this component of the research, reflecting on the previous discussions and interviews, alongside the findings of the analyses presented in Chapters 2 and 3.

4.1 Project Panel 1

In August 2019, the first Project Panel meeting was held in Melbourne. Attendees included representatives from state and federal government departments, community housing organisations, and tenant advocacy services, and the research team. The discussion was structured around identifying vulnerability to energy hardship, potential responses, and unforeseen issues. Figure 1 summarises the key topics of discussion in this Panel in visual form.

Vulnerability to energy hardship

All Panel members agreed that it is important to acknowledge the breadth of factors that can lead to energy hardship. Income was, of course, regarded as the key driver of vulnerability to energy hardship. The Panel shared a number of stories of people having to choose between going into rent arrears and being cold. People reliant on social welfare were seen as a key vulnerable group. Although income (or lack of it) was widely regarded as a major driver of energy hardship, the Panel noted that the issue extends far further than low-income households and manifests differently for different people. For example, some low-income renters with unaffordable housing costs may avoid energy hardship because they have energy-efficient homes. Overall, it was suggested that vulnerability must be measured and understood as much broader than simply a result of low income. Vulnerability may, for example, be related to location: renters living in hotter (e.g. Port Augusta) or colder (e.g. Mount Gambier or Launceston) places were seen as more vulnerable to energy hardship.

Although there is no 'one-size-fits-all' measure of energy hardship, the Panel identified several groups as particularly vulnerable: people receiving income- support payments; people experiencing long-term homelessness or who are precariously housed; newly arrived immigrants; single- parent households; households with 'low resources' (as opposed to low -income); and people with existing health problems. Similarly, the Panel also noted that problems were concentrated in certain types of housing: e.g. older public housing stock; dwellings not meant for continuous habitation (e.g. holiday homes, caravans); older detached homes in outer suburbs (that are un-insulated and un-renovated); and multi-storey dwellings nearing obsolescence.

In the current era of large-scale stock transfer from the public to community housing providers, the participants cautioned that there was evidence that, in some cases, transferred social housing stock presented a particular future risk, as it was often poor quality and had low energy efficiency. Relatedly, the Panel noted that newer social housing stock was often much more energy efficient and presented significantly less energy hardship risk, but that newer homes represented only a very small proportion of social housing stock.

Potential responses, strategies and solutions

The discussion covered a range of potential assistance measures, such as bulk procurement of energy-efficient appliances, financial counselling and energy brokerage, subsidised rooftop solar panels, mandatory disclosure of minimum energy-efficiency standards for rental properties, small-scale retrofits (e.g. draught sealing), and education aimed at behaviour change. Many of these measures have been trialled in small-scale interventions; but, overall, the Panel concluded that there remain persistent barriers to improving conditions within this sector and that the evidence from the piecemeal approaches was hard to transfer or 'upscale' to the community level.

At the household level, a number of immediate assistance measures have been trialled or undertaken—from giving people gloves and scarfs, to providing food relief, or offering financial counselling. It was noted, however, that it is preferable to help people before they get 'in a hole', because once 'in a hole' it is harder (and more costly) to assist them. There was particular concern among the Panel around the topic of financial counselling. It was widely agreed that the effectiveness of financial counselling is limited because among people with very low incomes, the problem is not *how* they allocate their budget, but that they just don't have enough in total to meet all of their basic needs.

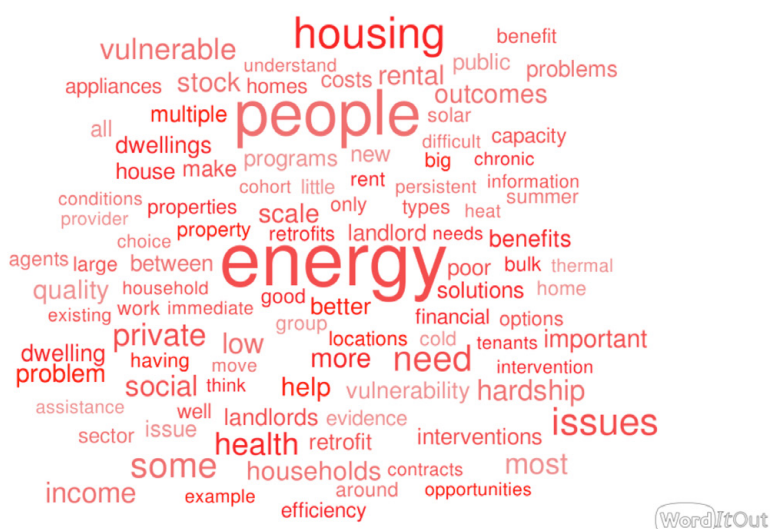
The Panel discussed a series of potential interventions (e.g. providing hot-water heaters) and the appropriate pathways for delivery (e.g. industry training; the role of tradespeople; agents and property managers as intermediaries). Similarly, landlords, agents and property managers were identified as appropriate delivery conduits for responding to problems of energy literacy among tenants.

The Panel also discussed: the potential of technological solutions; the need to better target, and then properly evaluate, interventions; and the problems involved in disentangling the complexity of vulnerability factors that tenants face.

Unknowns

Perhaps the largest unknown when considering energy hardship is the scale and nature of the problem. The Panel noted a lack of robust data detailing who is affected and the scale of thermal defects in rental houses, and a deficit of quantitative information on conditions in the rental sector. Without this information, energy hardship is difficult to quantify, and interventions are hard to formulate and target. The Panel suggested that, to some extent, the *documentation* of energy hardship problems can be more important than piecemeal responses to them, because this allows better interventions in the long term.

Figure 1: Dominant themes from the first Project Panel discussion



Source: Authors.

4.2 Focus group discussions and key informant interviews

A series of focus group discussions and key informant interviews were held to capture a breadth of perspectives on the impacts of energy hardship, as well as potential solutions. Participants included representatives from state government departments, community housing organisations, local government services providers, tenant representative groups, and broader welfare support organisations. The discussions focussed on two main areas: the impacts of energy hardship and poor housing conditions, and potential solutions.

What are the impacts of energy hardship and poor housing conditions?

Responses to this question added depth to our exploration of vulnerability and hardship in the literature review, and reflected the complexity of problems faced by tenants as documented in Chapter 3.

Participants, particularly from tenant advocacy organisations, spoke about how there is insufficient consumer power in the Australian private rental market. The regulations are set up in a manner that is meant to reflect an agreement between two equal parties (i.e. tenant and landlord) but, in reality, it does not work like this—particularly at the highly competitive low-cost end of the market. The result is that residents trade off housing affordability with housing quality and have little power to request basic maintenance or building improvements. For example, participants noted that many rental houses have neither inbuilt heating nor cooling, while others have appliances that are old and/or inefficient, and the majority of landlords are not willing to consider installing or upgrading appliances. Similar issues were noted with the buildings themselves: for instance, many houses are draughty and require constant heating to keep warm, while lease-based restrictions prevent the installation of blinds or outdoor shading.

Reflecting on the social rental sector, one participant noted that tenants are permitted to install an air conditioner themselves, but when leaving the property they are required to remove it and repair any damage; a cost that many tenants are unable or unwilling to meet. Responses indicated that investor landlords are generally more likely to install air conditioning, rather than make other improvements to a property (e.g. install insulation), because it is visible and hence they are able to charge higher rent. Similarly, energy savings were seen as being a low priority among investor landlords. This finding supports the implementation of a minimum standards policy across all housing, not just housing within the rental sector—particularly when we consider the substantial churn of properties from owner-occupied residences to rental housing.

The poor material quality of dwellings in both the private and social rental sectors results in tenants using a range of coping strategies to reduce their energy consumption. Participants related many stories of coping strategies and trade-offs made by energy-poor tenants. In hot weather, for example, tenants would visit air-conditioned places like shopping centres or libraries to ‘hide from the heat’ and avoid using air conditioning at home. Some tenants would sleep outside on hot nights because it was too hot indoors. Participants told us about instances, in colder weather, of residents sitting in the car to get warm, using the oven for heating, blocking draughts under doors with towels, or, in more extreme cases, simply going without heating. Similar practices were noted in terms of meal preparation and hygiene: for example, forgoing showers, or cooking using the microwave or barbecue, to reduce bills. As one of our participants stated, in relation to coping with high energy costs: ‘people just cut the heating ... [and] might not eat’.

Participants also spoke about how cost-of-living pressures, including high energy costs, led to arrears or other financial difficulties for tenants. For some, overdue bills and payments resulted in them losing eligibility for discounts with their energy retailer and paying high tariffs. One participant spoke of cases of residents moving house in an attempt to avoid their debt. Importantly, though, several participants commented that energy hardship and financial difficulty are rarely due to mismanagement of funds; rather, tenants simply do not have enough income (either via paid employment or income-support payments) to afford basic essential household expenditure. A participant from a housing advocacy organisation reinforced this point, stressing that low-income residents are often very good at managing their budgets. Another participant noted that energy hardship may not necessarily be expressed as utility/rent arrears, but rather increased reliance on other support services, including food banks (i.e. following consensual measures of energy hardship).

Participants' reflections often highlighted that energy hardship and poor living conditions (i.e. inadequate heating and cooling) often compound existing health conditions. For example, mental health conditions may worsen from the stress of managing household expenses or worrying that a child's living environment is not adequate. One participant suggested that these issues may manifest for older age groups in their taking much longer to 'start the day' in winter, when they cannot afford to keep the house warm enough. At a broader community level, flow-on impacts may include social isolation, decreased productivity or participation (in paid and non-paid work), and a rise in formal disputes around energy.

Overall, the discussions centring on energy hardship and vulnerability revealed the complexity of tenants' everyday coping mechanisms; relationships with housing providers, landlords and energy retailers; and broader socio-economic circumstances. Tenants' stories, relayed through the participants, pointed to very real and prevalent problems within the rental housing sector, but also demonstrated that the specific situations within which these problems are experienced are extremely diverse.

Effective programs and assistance measures

Following on from our discussion of energy hardship and vulnerability, we asked participants to identify or talk about assistance measures they thought may be effective in improving residents' living conditions. The discussion covered a variety of potential measures and existing programs, as well as barriers to assistive strategies.

The most widely suggested measure was mandatory minimum energy-efficiency standards for rental properties (both social and private). However, participants noted various issues with the implementation of minimum standards. For instance: the cost of retrofitting existing properties (whether to landlords, indirectly to tenants via increased rents, or to government via grants and subsidies); the importance of timing implementation to ensure equitable conditions across the market; the complexity of cross-governmental work (i.e. national regulation administered by states and territories); and the need for clear trajectories and due diligence to enable planning and mitigate unintended consequences (e.g. increased indoor air pollution from highly sealed homes, or elevated rents for 'improved' properties). Mandatory disclosure of building standards was raised as a solution linked to minimum performance standards.

Critically, for both the minimum energy-efficiency standards and mandatory disclosure solutions, participants noted that there would need to be a framework for enforcing compliance—an area that has historically been very weak, particularly for energy-efficiency requirements. The enthusiasm for setting minimum standards for residential buildings, shared by almost all the participants, was contrasted by one investor's perspective. The investor was concerned about the potential costs involved in retrofitting existing properties to meet minimum energy-efficiency standards. (It is worth noting that, to date, there is little quantitative evidence of the potential costs involved). The investor suggested that changes to tax settings (e.g. allowing depreciation of capital costs) and subsidies for capital upgrades were preferable options.

Across several discussions, the need to reframe how we think about rental housing and housing standards was raised. In particular, participants commented on the commodification of housing and stated a need to shift investors' mindsets from thinking of dwellings as 'investment properties' to 'people's homes'. There is clearly more work needed to untangle the role of investor landlords in providing a housing 'service' (i.e. their social responsibility) from their own priority 'to maximise rent and capital growth for minimum hassle'. Some participants argued that we need to speak about these issues in relation to residents' health and wellbeing, rather than in relation to dwelling energy efficiency or lowering carbon emissions. Even if a policy intervention realises co-benefits, in terms of energy use and carbon emissions, it is important to highlight the benefits to residents first, even though they may be harder to measure.

Other assistance strategies suggested by participants included: loans and subsidies for retrofitting (both for residents and landlords), offsite solar (tenure neutral), home energy audits, increased capacity to pay (i.e. increased income-support payments and concessions), and education targeted toward behavioural change. While many participants agreed that education is needed—and in forms that are appropriate for culturally and linguistically diverse communities—they also felt that education alone is insufficient. Many participants thought that decent housing must be the first priority, with an agreed definition of ‘decent’ being an important starting point for any material improvement intervention programs.

The potential role of stakeholders to facilitate change also became apparent through the discussions. For example, at the national level, there is an opportunity to create market incentives via government investment in improving social housing. This would have co-benefits as an economic development strategy, creating jobs and upskilling the population. At the community level, property managers play a large role in mediating tenants’ requests for maintenance and improvements. Participants suggested that property managers and agents could represent an intervention point to facilitate and advise on dwelling retrofits (though participants also noted a current lack of training among property professionals in this area).

Many participants highlighted the need to more holistically evaluate the benefits associated with improving people’s living conditions, arguing that a solely economic evaluation does not capture the full co-benefits to health, wellbeing and social inclusion, and this may result in undervaluing a policy change. While clearly altruistic in their views, participants noted that such an approach requires a reframing of the discussion from simply ‘energy efficiency in housing’ to ‘housing that supports residents’ health and wellbeing’. As one participant stated: ‘policy change then becomes a moral imperative’. Overall, the focus group discussions and key informant interviews highlighted the need for a multilayered approach to reducing energy hardship and improving housing conditions within the rental sector. As one stakeholder described it: ‘solutions from all angles’.

4.3 Project Panel 2

The second Project Panel meeting was held in Melbourne in November 2019. The primary aim was to consolidate the evidence gathered by the previous research components to further refine our identification of key issues and prioritisation of policy intervention pathways. Figure 2 summarises the key topics of discussion in this Panel in visual form.

Prioritisation of policy interventions

The Panel discussion remained wide-ranging in terms of possible solutions and their effectiveness. Across all of the conversations with stakeholders at the two Project Panel meetings, the primary guiding objective was creating living environments that support tenants’ health and wellbeing. However, participants also recognised that some intervention strategies may realise other important co-benefits, including reducing carbon emissions related to energy use in the home, and creation of employment and training opportunities associated with increased activity within the construction sector.

As with the first Panel meeting, and the subsequent discussions with focus groups and key informants, minimum standards for the energy-performance of rental homes was seen as a critical starting point. Participants suggested that minimum standards must underpin all other strategies because ‘there’s no point putting water in a leaky bucket’. Similarly, mandatory disclosure of dwelling performance was seen as a potentially powerful tool to aid residents in their selection of properties, and as a way of monitoring compliance with minimum standards (e.g. following the approach of the European Energy Performance Certificate).

Addressing systematic problems of an aged and poorly maintained public housing stock, participants suggested that a comprehensive knock-down-and-rebuild program may work to improve public tenants’ living conditions but also to create market incentive for widespread improvement in the private market. Such a program could be framed as land tax reform and an employment-driven stimulus measure while still realising important welfare co-benefits. A participant from state government suggested that existing rebates and improvement schemes could be made available to the public sector (i.e. not just community housing providers or the private rental market) in order to improve the material condition of the public housing stock.

Several low-cost strategies at the household scale were suggested: for instance, assisting tenants with the practical skills to undertake minor improvements, such as hanging curtains, draughtproofing their home, zoning off areas for heating and cooling, or even putting bubble wrap on windows for added insulation. Panel members proposed that installation of reverse-cycle air-conditioning systems should be prioritised, as they can offer both efficient heating and cooling. Importantly, participants noted that while rooftop solar panels offer potential bill savings for tenants, there exist issues with equity (e.g. costs are passed on to people without solar) and infrastructure capacity (i.e. grid infrastructure for solar is at capacity in some areas).

All of these proposed solutions specifically target issues of high energy costs or poor dwelling conditions. One Panel member suggested, however, that some tenants simply require more money to meet their basic living expenses, and that therefore an alternative pathway would be to increase income-support payments across the board. In addition, participants agreed that financial counselling for vulnerable households could also be helpful, as many of these households are on the highest energy tariffs, but that this should not be seen as a sole solution.

Pathways for advocacy and change

The Panel explored numerous pathways for initiating change and delivering assistance measures. Participants suggested that, at the household or tenant level, the agency of tenants in negotiating improved material conditions should be increased. For instance, through targeted communication outlining the rights of tenants (particularly in light of the regulatory changes in some jurisdictions); by providing information on how tenants could improve the energy performance of their home (balanced, in the public sector, with information on broader forms of assistance); and by offering practical demonstrations of skills (i.e. how to put curtains up), as opposed to general information that may not be directly actionable. A Panel member from a tenants' advocacy organisation argued that the 'norms' of living environments also need to be addressed, as many tenants do not know what good housing 'looks like'.

Throughout the discussions, the role of the landlord was frequently raised. There was general consensus that landlords should be encouraged (whether via regulation or softer measures) to assume a greater duty of care to their tenants in terms of providing safe living environments. Avenues for change in this area include: motivating landlords to improve conditions in order to keep 'good' tenants; temperature monitoring to provide an objective measure of the thermal fitness of the dwelling; or requiring appliances (e.g. hot-water services) to be upgraded instead of replaced 'like-for-like'.

The discussions also touched on the ways in which various organisations/sectors may be equipped to deliver services and assistance.

- Energy retailers—could be required to fund a number of dwelling retrofits per year² (based on the UK model).
- General practitioners (GPs) or other health practitioners—could be given the power to 'prescribe' better housing.
- NGOs—have existing connections to vulnerable populations and have a social obligation (i.e. as opposed to a focus on returning a profit) and thus are well placed to offer education or assistance.
- Local government—have existing relationships with households and are a relatively trusted level of government and therefore would be able to disseminate information on available assistance programs.
- State-level energy and water task forces—could be established/enhanced to train people to deliver retrofits or other services.

² For example, following the UK Energy Company Obligation (ECO) scheme. More information at <https://www.ofgem.gov.uk/environmental-programmes/eco/energy-suppliers>

Key sticking points or blockages to policy intervention

Concerns were raised by numerous stakeholders about the funding of interventions. Government representatives voiced concerns about staffing, limited funding and narrow mandates. Other panellists argued that interventions must be negotiated across departments (e.g. health, housing and social services) and across levels of government (federal and state/ territory). Participants indicated that attaining initial capital was an area of difficulty for community housing providers, as well as for tenant households, in order to participate in co-funded retrofitting or solar panel programs.

The Panel also raised concerns about landlords' willingness to fund home improvements, future maintenance of improvements (e.g. solar panels), or replacement of appliances with energy-efficient models (e.g. hot-water services, heating and cooling appliances). Panellists suggested that landlords would be likely to raise rental costs after making any improvements to housing conditions, negating any benefits to tenants. Indeed, this sentiment was reflected in the key informant interview with an investor landlord (i.e. they indicated they would seek to recover costs through increased rent). In the current highly competitive Australian rental market, it is likely that a tenant facing such a rent increase would be forced to choose between making the higher payments (and remaining in the home) or diminished choice of dwelling (moving to a cheaper, less-desirable home)—as opposed to the property being priced too high for the market and loss of lease income.

There was broad consensus among Panel members that any strategy comprising voluntary action for landlords would have limited effectiveness, and that mandatory minimum standards—together with strong compliance checking—would be a more effective measure to motivate landlords. Some panellists noted that the Federal Government is reluctant to introduce policy that might impact the private rental market (i.e. in a manner that disincentivises investors). However, several stakeholders suggested that disinvestment in the rental sector could be a positive outcome for tenant households.

The potential role of property managers in enabling, initiating and advising on energy-efficiency related maintenance and upgrades was raised during the Panel discussions. Panellists acknowledged that property management is a high-turnover profession and requires no formal training or qualification. Panel members therefore suggested that in order to push for change in this area, property agents would need to be bound by regulations. For example, in the UK, property managers are penalised if they let a dwelling that is not up to standard, or if they fail to disclose dwelling performance information. Participants identified other barriers preventing property managers from helping tenants improve energy efficiency, including managers being time-poor, with little motivation to invest in extra work that is not core business.

At the household level, several important barriers were identified in terms of targeting those households most in need, tenant agency, administrative burden, and the relative effectiveness of material solutions. Several Panel members observed that current interventions are not reaching those households most in need, for a range of reasons. In some cases, households do not want to ask for help as there is a perception of shame associated with requesting assistance, or they do not yet feel that they have reached a tipping point where they are desperate for assistance. Panellists suggested that making interventions universally available (but perhaps means-tested) would overcome some of these barriers. Similarly, some participants suggested that households are simply too busy to understand or engage with programs sufficiently to work out whether the program will be a good deal for them or not—panellists noted that it can be a struggle to get vulnerable households to accept even free upgrades because of this.

Finally, several limitations regarding material or technological upgrade were discussed. Panellists noted that: there is a functional limit to what can be done to mitigate heat risk without resorting to air conditioning; even when heating or cooling appliances are installed, tenants may not be able to afford to use them; and tenants may not even desire (and therefore are unlikely to use) the technology offered.

Priorities for research

The majority of the Panel concluded that more evidence is needed to support advocacy and guide intervention. Priority areas for further research include: better and more thorough evaluation of existing interventions; holistic quantification of the benefits of interventions (i.e. looking beyond economic benefits to incorporate measures of health, wellbeing, productivity, social inclusion, employment and education); the cost to health and wellbeing of poor living environments; and incorporating energy costs into assessments of housing affordability. Panellists held differing views on the importance of research evidence. For example, some felt that none of the evidence generated to date has been significant enough to motivate change, that people are less interested in data than in powerful stories, and that governments may be hesitant to fund research that demonstrates a problem they are reluctant to address.

Mobilising alternative narratives

During the second Project Panel meeting we asked members to consider whether we—as advocates, stakeholders and researchers—need to tell alternative stories to bring these issues to light and convince governments of the need for action. As touched on briefly in the previous section, the Panel suggested that none of the narratives around energy hardship and poor housing conditions have yet been powerful enough to mobilise significant resources.

Health was identified as one of the most powerful discourses available. For example, a panellist noted that, in the UK, statistics on the association between excess winter deaths and fuel poverty are released annually, creating a regular political imperative for action. The panellist also noted the importance in the UK of narratives around protecting children's and elders' health. In thinking about narratives around healthy living environments, the Panel discussed the relative usefulness of terms such as 'decent', 'habitable' and 'safe'. 'Safe' was thought to be the most appropriate term: that is, landlords ought to have an obligation to provide *safe* living environments. Germane to discussions of health and safety were ideas of fairness and equity. These motivating ideals were cited by many of the panellists in an opportunity to provide final remarks at the end of the meeting.

Finally, the Panel suggested that creating space for tenants to tell their own stories, safely, may assist in giving people a chance to connect with others' personal experiences. It was noted that many Australians cannot contemplate how hard circumstances are for some vulnerable households. We could consider shaping a narrative around people's ability to live in safe environments, rather than around houses (and their relative efficiency) *per se*.

Priorities for future engagement

Throughout the project we have attempted to gather a wide variety of perspectives, particularly on the potential pathways for policy intervention. However, during our final Panel meeting, we asked members to reflect on who else needs to be brought into the conversation. Suggestions included:

- landlords, investors and property managers—gatekeepers who have typically been hard to engage
- construction industry peak bodies (e.g. Housing Industry Association)—powerful lobby groups that could support or oppose regulation
- energy retailers—have the capacity to initiate and deliver hardship programs to customers
- government health departments, health practitioners and advocacy groups (e.g. Australian Medical Association)—can assist in recasting safe living environments as a public health issue.

5. Policy development options

Two observations from this research have not explicitly been captured in this report so far, but deserve highlighting. The first is the quiet, almost universal hopefulness we witnessed among stakeholders. Although, as this report has shown, the problem of energy hardship in the rental sector is significant and difficult to address, many stakeholders expressed a belief in imminent change. That feeling is no doubt related to the convergence of current and emerging debates, events and policy developments (across, for example, climate awareness), and the rental reform process underway in many states.

The second observation relates to the framing of the problem of energy hardship. Even though the issues documented in this study exist within the housing system, perhaps the most effective way to frame energy hardship is as long-term social or economic disadvantage, a driver of health inequality, and a result of inadequate welfare protections. Such a revised framing of the problem of energy hardship may be promising, as it brings to the table an extended group of stakeholders and access to more powerful policy levers.

5.1 Responding to energy hardship within the Australian rental sector: a summary of findings

What does research and policy tell us about energy hardship among renters in Australia?

This study found that a significant portion of the Australian population is experiencing, or is nearing, energy hardship. Energy hardship is often experienced by low-income rental households living in poor-quality housing, who are unable to engage with support programs to undertake retrofit or other assistive interventions.

Prevalence and characteristics

The AHCD analysis identified that up to a quarter of participants had been under financial strain in the previous year, with around one in ten rental households unable to pay their energy bills on time. Up to a fifth of rental households were unable to heat their home sufficiently in winter, which is not surprising given both private and social rental tenants reported more major building problems, such as mould and rising damp—made worse by cold internal temperatures during winter—compared to owner-occupiers. Furthermore, the most vulnerable households were found to be lone-person or single-parent households, and women were overly represented.

Impacts of hardship and access to relief

While the HEET interviews provided some indication of the implications of energy hardship, (e.g. interviewees sleeping in front of a heater in winter but struggling to pay for the energy bills), there was limited documentation of this in the existing, broader literature. The HEET interviews revealed that low-income rental households are, in many cases, uncertain of their rights in relation to improving housing quality and making requests for maintenance or appliance upgrades. A number of participants reported that the landlord had put up their rent following previous requests for maintenance or quality improvements. While some of the households were aware of various support programs (including financial assistance), they felt such programs involved too much paperwork (e.g. seeking a support letter from a doctor), or that they would not be supported by the landlord in applying. Many participants did not seem to understand or know about other support options available to them in relation to addressing energy hardship (e.g. hardship plans or energy concessions).

Tenant capacity

The attitude of tenants is a compounding factor in attempts to find a resolution to the thermal performance problems of rental housing, and of social housing in particular. Private rental tenants are more likely to view themselves as consumers and thus to advocate for better outcomes, but many social housing tenants are grateful for the security and low cost of their tenure, and are therefore accepting of homes that do not offer thermal comfort and which impose high energy costs.

Summary

Energy hardship in Australia is most often an expression of overlapping and existing social, economic and material disadvantage. We found anecdotal evidence of negative impacts to the health and wellbeing of affected householders, but this has not been extensively documented within the Australian literature. The effectiveness of existing programs that aim to relieve energy hardship is largely unknown, but our research suggests that they are unlikely to be reaching those households most in need.

What government and non-government programs exist to improve energy efficiency and affordability? What lessons can be learnt from these?

The review of the current policy landscape and our discussions with panellists and key stakeholders revealed that currently a range of programs target improving energy efficiency and affordability outcomes for low-income rental households and property owners—including national, state and local government, and non-government initiatives.

Key features

Most programs are developed and administered at the state/territory government level. The different types of programs include: education, energy concessions, emergency relief, health/medical rebates, payment assistance, mandatory disclosure of energy performance or minimum building standards, no-interest loans, energy-efficiency retrofit schemes, appliance-specific grants (e.g. for solar, LEDs), and appliance buyback schemes. The large majority of current initiatives are primarily designed to ease the burden of energy costs for low-income households, but do not specifically target rental tenants.

Key lessons

There is limited research evaluating these types of programs in Australia (or internationally), especially in terms of the benefits afforded to households. To date, no work has comprehensively documented the whole suite of programs available, or their effectiveness; therefore, it is challenging to identify which are most successful for different cohorts of low-income rental households. The analysis of the HEET interviews demonstrated that lack of tenant awareness and participation in such programs is a key challenge. There is a clear need for improved communication of the programs and clarity around eligibility requirements in order to encourage a higher uptake. The interviews also revealed that tenants are concerned that landlords will use any request to improve energy-efficiency outcomes (even when fully funded by government programs) as a reason to increase rent. There was no evidence that this was actually the case, and research should be undertaken to explore if this is perception or reality.

While supports aimed at improving living conditions for Australian renters and low-income households do exist, our research suggests that, across all levels of government, there needs to be a scaling up of responses, more clearly defined focus for policy, and integration with other policy mechanisms.

What are the key governance challenges to uptake and implementation of energy interventions in Australia? What emerging opportunities should we be aware of?

The research documented numerous challenges to the uptake and implementation of energy-related interventions, particularly at the broader governance level.

An agreed definition of energy hardship

There remains an ongoing challenge around how energy hardship is viewed, defined and measured. This could mean that support programs do not always reach those households most in need. Furthermore, while some households are not in energy hardship based on traditional understandings, they are only able to meet their energy needs by reducing consumption in other areas, such as food or housing.

A continuing governance challenge is that energy hardship and vulnerability is often nuanced, varying across geographic locations and depending on household characteristics. Therefore, developing a 'one-size-fits-all' national response may be problematic. The research revealed a need for a broader understanding and conceptualisation of energy hardship. A key conclusion from the discussions was that more robust data is required in relation to defining and measuring energy hardship and housing quality, particularly in the low-cost rental sector, if solutions are to be improved and deliver desired outcomes.

Consensus of policy objectives

Project participants discussed what the principle objective of policy intervention should be. They generally agreed that creating living environments that support tenants' health and wellbeing should be the primary guiding objective. However, there is currently no clear definition of what constitutes a 'decent' or 'safe' home.

Cross-departmental and cross-jurisdictional work

As documented in Chapter 2, many of the current programs are facilitated at a state or local government level, which may allow for a more tailored, flexible response. Scaling up of programs or trials was found to be challenging; government representatives voiced concerns about staffing, limited funding and narrow mandates. Some participants argued that interventions must be negotiated across departments (e.g. health, housing and social services) and across levels of government (federal and state/territory).

Direct and indirect costs to tenants

Participants indicated that attaining initial capital was an area of difficulty for community housing providers, as well as for tenant households, in order to participate in co-funded retrofitting or solar panel programs. They also expressed concern that implementing minimum energy-efficiency standards may result in landlords raising rental costs once they have improved the condition of their housing, negating any benefits to tenants.

Summary

A key challenge in the current Australian housing regime is the commodification of housing. We suggest that reframing the role of housing—and quantifying the impact of poor living conditions—may overcome some of the barriers summarised in this section, which we largely attribute to housing's role as an investment vehicle.

How might existing and proposed energy interventions be framed differently to more effectively reach those groups most at risk?

The research revealed a number of opportunities to enhance existing policy and programs.

Catching people before they experience energy hardship

The key stakeholders and Project Panel members spoke about the need to shift from addressing the issue once it had emerged to prevention, as it is easier to keep people from entering energy hardship than to get them out of it once they are experiencing it. However, researchers and policy makers do not typically seek to identify people at the 'tipping point' of energy hardship, and pinpointing such households may require different data collection methods to those currently used. Nevertheless, the prevention approach bears considerable merit and is worth exploring in future research.

Strengthening tenants' rights

While some jurisdictions have improved tenant rights in recent years, our research found that there is still widespread concern that renters lack control and agency. There is a need to strengthen tenant rights, while also ensuring that residents are aware of those rights. There remains a perception that renters who ask for upgrades risk having their rent increased or losing their tenure—in part due to the highly competitive private rental market. Importantly, there needs to be a clear understanding of what constitutes basic housing quality. This could be partially addressed by creating and enforcing minimum energy-efficiency standards—this would, over time, improve the quality of dwellings that are substandard. While implementation of minimum energy-efficiency standards was participants' preferred approach, mandatory disclosure of energy efficiency was discussed as an alternative.

Incentivising landlords

Current programs that enable landlords to claim tax rebates or other financial assistance could be reworked to require appliances (e.g. hot-water services) to be upgraded instead of replaced 'like-for-like'. This would help improve energy efficiency and performance over time. While there are provisions for checking landlord compliance with regulations, and penalties for non-compliance (i.e. via each state/territory's minimum housing standards), these are applied too infrequently and the penalties are too low to be an effective driver of change.

Educating intermediaries

Participants recognised that key intermediaries, such as property managers and tradespeople, could play an important role in improving property and household outcomes, but that they may not yet have a sufficient level of understanding or training. Basic training for these associated professions around the technological, material and behaviour changes that can improve energy efficiency could provide a useful short-term intervention point.

Summary

The findings drawn together in this section suggest three things: i) that better education and communication of tenant rights, energy-efficient products, and assistance is needed; ii) that the private sector in particular would benefit from community-led discussions to develop a deeper understanding of the role of housing for different stakeholders; and iii) that nationally representative and comprehensive data on housing conditions, economic and social circumstances, and household wellbeing would greatly assist in motivating policy change.

What roles might different government and non-government service providers play?

A key role for housing and welfare advocates, across both government and non-government sectors, is to shift the perception of rental properties as 'investment opportunities' to 'homes for people'. In this regard, we must first develop a consensus about what constitutes a minimum standard of housing, or a 'safe' home. With this basis, there exists an opportunity to bring a range of previously under-engaged stakeholders into the discussion and formation of intervention strategies—including, for example, health practitioners, members of the construction industry, property managers and investors, and energy retailers.

5.2 Final remarks

This research was undertaken as Australia approached the COVID-19 crisis. Policy change that has occurred since the epidemic emerged—such as the raising of many welfare benefits, and strengthening of some of the protections for renters around security of tenure and rent control—are likely to provide short-term benefits for private and social rental tenants alike. It is important to acknowledge, however, that the challenge of thermal performance in the private rental stock will not be solved by short-term actions; rather, a long-term, strategic approach is needed.

The quantity and quality of available rental housing stock changes over time in response to fairly slow-moving housing policy settings (such as those relating to negative gearing or minimum building standards). In many cases, this has encouraged investor landlords to seek the most inexpensive dwellings possible to rent out, have contributed to today's housing affordability challenges. To date, the government has not developed adequate regulatory settings or investment programs to encourage the provision of thermally efficient rental housing. There is an opportunity for governments across Australia to stimulate local economies, and at the same time enhance the long-term wellbeing of the population, through a targeted program of investment in improvements to housing.

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Appendix 1: Summary tables of existing policies and intervention strategies

Table A1.1: Summary of state and territory initiatives providing financial assistance

State/territory	Concessional rebate information	Web link
Australian Capital Territory	<ul style="list-style-type: none"> • Energy concession • Emergency relief voucher 	https://www.actsmart.act.gov.au/
New South Wales	<ul style="list-style-type: none"> • Low-income household rebate • Life support rebate • Medical energy rebate • Family energy rebate • NSW gas rebate • Seniors energy rebate • Energy accounts payment assistance scheme 	https://www.energy.nsw.gov.au/energy-consumers/financial-assistance/rebates
Northern Territory	<ul style="list-style-type: none"> • Pensioner and carer concessions 	https://www.powerwater.com.au/customers/how_to_read_your_invoice
Queensland	<ul style="list-style-type: none"> • Energy rebate • Medical cooling and heating electricity concession scheme • Electricity life support • Home emergency assistance scheme • Electricity asset ownership dividend 	https://www.qld.gov.au/housing/buying-owning-home/energy-water-home and for regional customers https://www.energymadeeasy.gov.au/
South Australia	<ul style="list-style-type: none"> • Energy bill concession • Emergency financial assistance • Medical heating and cooling concession 	https://www.sa.gov.au/topics/energy-and-environment/energy-advice-and-education/energy-partners-program/services-for-households
Tasmania	<ul style="list-style-type: none"> • Your Energy Support (YES) • Annual electricity concession • Life support concession • Medical cooling concession 	https://www.auroraenergy.com.au/want-bit-help-your-energy-bill-yes

State/territory	Concessional rebate information	Web link
Victoria	<ul style="list-style-type: none"> • Life support concession • Medical cooling concession • Service to property charge concession • Controlled load electricity concession • Annual electricity concession • Excess energy concession • Transfer fee waiver concession • Utility relief grant scheme (URGS) • Winter gas concession • Non-mains energy concession 	https://www.victorianenergysaver.vic.gov.au/get-help-with-your-bills/concessions-and-rebates
Western Australia	<ul style="list-style-type: none"> • Energy assistance payment • Hardship utilities grant scheme • Dependent child rebate • Account establishment fee rebate • Air-conditioning rebate • Life support equipment electricity subsidy • Thermoregulatory dysfunction energy subsidy 	https://www.erawa.com.au/electricity/switched-on-energy-consumers-guide/concessions-and-assistance and https://www.synergy.net.au/?Home

Source: Adapted from Whaley and Hamilton (2019).

Table A1.2: Summary of intervention measures aimed at improving energy affordability or living conditions in Australia

Name	Purpose	Target population	Notes	Reference	Evaluated (Y/N) and findings	Reference: evaluation report
Australia-wide						
No Interest Loan Scheme (NILS)	Reduce energy use	Pensioners with concession, health care card	Purchase energy-efficient appliances			
Clean Energy Finance Corporation (CEFC)	Increase energy-efficient housing	Community housing organisations	Loans for construction of new, energy-efficient community housing and energy refurbishments of existing dwellings	CEFC 2016; Vorrath 2019		
Australian Capital Territory						
ActSmart Low income Energy Efficient Program	Reduce energy use	Low-income households	Through St Vincent de Paul, home energy-efficiency assessment and free, objective view of household's energy and water needs; advice and education on how to save energy and water; information kit with energy-saving tips, shower timer, thermometer, draughtproofing	Australian Capital Territory Government 2020		
ActewAGL's Energy Support Fund	Increase household income; reduce energy use	Households (not specified)	Various mechanisms apply including financial counselling, but mainly relates to hardship in paying bills			
Energy Efficiency Improvement Scheme	Reduce energy use	Priority households—low-income private, public and community housing renters on energy retailers' hardship programs	Commenced 2012, later extended to include gas retailers and to promote insulation activities and a shift from gas to electrical appliances	Australian Capital Territory Government 2018; Rattenbury 2019	Y - Lighting upgrades, standby power controllers, draught-sealing measures and upgrades of space conditioning systems are reported to have saved households about \$300 annually on electricity bills	ACT Environment Planning and Sustainable Development Directorate 2018

Name	Purpose	Target population	Notes	Reference	Evaluated (Y/N) and findings	Reference: evaluation report
ActewAGL's Refrigerator Buyback	Reduce energy use	Households (not specified)—ActewAGL customers only	Free removal of fridges (need to be 2-door fridges to get a rebate)	ACT Government 2020		
Solar for low income	Reduce energy use	Low-income households: pensioners/ concession-holders	Commenced 2017	ACT Government 2020		
Energy Saving House Call	Reduce energy use	Households (not specified)	2013–16	ACT Government 2020		
Mandatory energy-efficiency disclosure	Inform renters of house energy performance	Landlords and renters	Provides rating		Y - Higher-rated homes have been shown to attract higher sale and rent prices; the usefulness of ratings for short term renters has been questioned	Engwirda 2019; Pitt and Sherry 2014
New South Wales						
Home energy-efficiency retrofits	Reduce energy use	Households (not specified); includes renters	Commenced 2009	IPART	Y - Renters satisfied with energy-efficient light bulbs and drop in electricity costs; some participants were dissatisfied with automated switching off, although appreciated the energy-saving potential of standby power controls	Liu and Judd 2016
Home Energy Action Program	Reduce energy use	NILS recipients	Commenced 2017			
LED replacement	Reduce energy use	Households (not specified)	Commenced 2011			
Energy-efficiency training and knowledge building	Provide advice	Renters and community workers	Pilot program			

Name	Purpose	Target population	Notes	Reference	Evaluated (Y/N) and findings	Reference: evaluation report
Energy Hardship Assist Program	Increase access to renewable energy	Social housing	Government and energy retailer share the costs of the installation; the housing provider covers the costs of maintenance	Acil Allen 2018		
Solar Gardens	Facilitate access to renewable energy	Renters and apartment dwellers	Community-owned off-site solar PV	Enova 2019		
Social Housing Upgrade Program	Reduce energy use and switch to renewable energy	Public, community and Aboriginal housing	Improve the energy efficiency of insulation, airtightness, lighting, cooling, natural ventilation and hot-water systems in their building stock	Acil Allen 2018		
Energy+Illawarra Project (LIEEP)	Reduce energy use	830 older low-income Australian households in Illawarra region	Social marketing with retrofits—melding science, social science and community practice	Cooper, Gordon et al. 2016	Y - A significant and positive effect on perceptions of thermal comfort, and satisfaction with thermal comfort that persisted beyond the implementation of the intervention; increase of 1–2°C in internal temperature following insulation.	Cooper, Gordon et al. 2016
Powersave	Reduce energy use	Low-income households, specifically: Indigenous; those on aged and disability pensions, unemployment or study benefits; and those struggling to pay council rates—in Northern NSW - Inverell, Bundarra, Tingha, Warialda, Bingara and Glen Innes	900 households targeted, 300 households participated; home energy assessment, energy reduction plan, monitoring, and reward	BEST employment 2016	Y - 89% of households reduced energy consumption by 10% or more over four billing periods; 96% indicated that they had changed energy consumption habits; average reduction in energy consumption was 4.54kWh/day	BEST employment 2016

Name	Purpose	Target population	Notes	Reference	Evaluated (Y/N) and findings	Reference: evaluation report
Northern Territory						
Manymak Energy Efficiency Project (LIEEP)	Reduce energy use	Aboriginal housing in East Arnhem Land	Trial of energy-efficiency initiatives: hot-water system checks and upgrades; timers in kitchens; BEEBox displays to measure and display daily energy use (40% of households)	Indigenous Essential Services 2016	Y- 253,000kWh saved over trial (2015) compared to use by neighbouring communities; ceiling insulation saved 2kWh/day per household; cooking timer saved 1.3–2kWh/day per household (most cost-effective)	Indigenous Essential Services 2016
Smart Cooling in the Tropics (LIEEP)	Reduce energy use	Vulnerable people (urban Indigenous, refugees, the elderly, and those living with chronic health conditions or disabilities)	2014–16 Trial of various approaches to enhance residential cooling, comfort, and energy efficiency (participants had 15% lower than average energy use for Darwin prior to trial): structural modifications, behaviour change or appliance upgrade	Steinborner, Michael et al. 2016	Y - 82% of participants reported improved thermal comfort without increased electricity consumption—some had moderate reduction in electricity use; estimated 80kWh saving per year per household; ceiling fan upgrades had largest impact on heat stress	Steinborner, Michael et al. 2016
Queensland						
Sunny Savers, solar on public housing	Increase access to renewable energy	Public housing tenants in Cairns, Rockhampton and Logan	Trial—testing the supply of solar electricity microgeneration through solar power purchase agreements	QCOS 2020		
Supply of off-site solar electricity	Fuel-switch to renewable	Aboriginal housing in Lockhart River: 'eligible public housing tenants'	Trial—shifts the fuel source for some electricity generation from diesel to solar PV; costs/benefits to be shared by the housing organisations and eligible tenants	Queensland Government		

Name	Purpose	Target population	Notes	Reference	Evaluated (Y/N) and findings	Reference: evaluation report
Reduce Your Juice (LIEEP)	Reduce energy use	Young-adult, low-income renters—greater Brisbane	Education and equipment replacement—use of digital engagement and gamification	Swinton, Little et al. 2016	Y - 12.3% improvement in energy consumption on previous year; \$54.82 average saving on quarterly electricity bills (\$219.28 annual); 22.5% improvement in energy habits	Swinton, Little et al. 2016
Bright Actions—The Energy to Save (LIEEP)	Reduce energy use	Refugees	Trial—four different approaches: a personalised home visit, energy-efficiency workshops, inserting energy-efficiency information into the Life Skills Orientation Program undertaken by all new arrivals to Australia, and facilitating access to the No Interest Loan Scheme (NILS) and a bulk-buy scheme for energy-efficient appliances	QCOSS, MDA and MEFL 2016	Y - Measurable savings averaging \$363 per household over five years; 70 loan approvals (with a value of \$60,069) for the purchase of 30 major energy-efficient appliances	QCOSS, MDA and MEFL 2016
South Australia						
Residential energy-efficiency scheme	Reduce energy use	Audits: targeted low-income households in priority groups Energy efficiency: targeted households	2009–14		Y - Renters were satisfied with energy-efficient light bulbs and drop in electricity costs; some participants were dissatisfied with automated switching off, although appreciated the energy-saving potential of standby power controls	Liu and Judd 2016
Retailer Energy-Efficiency Scheme	Reduce energy use	Audits: targets low-income households in priority groups Energy efficiency: targets households	2015–20			

Name	Purpose	Target population	Notes	Reference	Evaluated (Y/N) and findings	Reference: evaluation report
Solar Savers Adelaide	Increase uptake of solar PV	Rental households	Full capital costs are recovered over 10 years from the landlord via council rates; rent increases to be negotiated between landlord and tenant	City of Adelaide 2019		
Virtual Power Plant	Increase access to renewable energy and storage	1,100 public housing tenants first, possibly to be extended	50,000 5kW solar PV systems and battery storage	Government of South Australia 2019		
Uniting Communities Beat the Heat! trial	Reduce energy use	200 low-income renters	2013–16 Community housing reverse-cycle air conditioner (RCAC) upgrade and/or insulation; home energy assessment and installation of in-home display	Uniting Communities 2016	Y - 81% of homes had substantial value improvement; 78% of homes had improved thermal comfort; energy usage increments (for installing a RCAC) were much lower than expected; air conditioner replacement resulted in more than 600kWh reduction in energy use; participants reported improved sleep, improved mobility and reduction in stiffness and pain, and improved mental health	Uniting Communities 2016
Tasmania						
Tasmanian Energy Efficiency Loan Scheme	Reduce energy use	Households (not specified); rental tenants eligible to apply	No-interest loans up to \$10,000 available for building shell retrofits, fixed appliance upgrades and solar PV and battery systems	DEE 2019		

Name	Purpose	Target population	Notes	Reference	Evaluated (Y/N) and findings	Reference: evaluation report
Victoria						
Victorian Energy Upgrades program	Reduce energy use	Households (not specified)	Commenced 2009			
Victorian Energy Efficiency Target (VEET)	Reduce energy use	Households (not specified)	Commenced 2009			
Moreland Solar City Warm Home Cool Home	Reduce energy use	Households (not specified): included 20% rented properties, including public housing dwellings	2007–12 Home energy audit, retrofit and energy education program		Y - Households: saved \$77 annually. reported improvements in perceived thermal comfort, and showed increased energy-saving behaviours; renters were more satisfied with the program than home owners	Johnson, Sullivan et al. 2013
Micro-grid trial for apartment buildings in Melbourne	Switch to renewable energy and battery storage	Three apartment buildings	Trial—run by Australian Energy Foundation, Ovida and Allume Energy and supported by Victorian Government; there may be a risk of systemic disadvantage, as the buildings and their tenants are locked into a contract for years	Aliento 2018		
Moreland Power Program	Reduce costs and switch to renewable energy	Households experiencing energy hardship, including renters and apartment dwellers	Pilot program—run by Australian Energy Foundation; the electricity generated on council buildings to be sold at a lower-than-market price	MEFL 2019		
Interest Free Loans for Solar PV	Increase uptake of renewable energy on rental properties	Renters and landlords	City of Darebin; payback period of 10 years interest free	ACCC 2018		

Name	Purpose	Target population	Notes	Reference	Evaluated (Y/N) and findings	Reference: evaluation report
Solar Homes program	Reduce cost and increase uptake of renewable energy	50,000 private and community housing renters (public tenants not eligible)	Systems owned by landlord—save up to \$2,225 on supply and installation; rent increases as a result of the solar PV installation are prohibited by a program agreement with the landlord; since 2019, tenants can no longer co-contribute to a system	Solar Victoria 2019a, 2019b, 2019c		
New public housing—better-than-minimum NatHERS	Reduce energy use through better design	Public housing tenants	All new low-rise public housing units must be designed to a NatHERS rating of 1 star above the minimum required by NCC, and must be all-electric homes with 2kW solar PV panels	DHHS 2018		
Catalyst Homes—public housing	Reduce energy use through better design	Public housing tenants in Horsham			Y - Benefits in reduced energy and water consumption and costs, measured and perceived thermal comfort, perceived health and satisfaction with the home	Moore, Strenger et al. 2015
Energy-efficient refurbishment	Increase building energy efficiency and thereby reduce energy use	Public housing	Energy-efficiency retrofits in high-rise and ceiling insulation in low-rise when there's a change of tenant	CAV 2016		
La Trobe Valley Home Energy Upgrade Program	Reduce energy use and increase uptake of renewable energy	Community housing organisations	Grants up to \$4,500 to improve energy efficiency of building envelopes, upgrade heating, cooling and hot-water appliances; and install solar PV panels	Acil Allen 2018; Latrobe Valley Authority 2017		

Name	Purpose	Target population	Notes	Reference	Evaluated (Y/N) and findings	Reference: evaluation report
EnergySmart Public Housing Project	Reduce energy use and increase knowledge	1,500 public housing households	Trial—new energy-efficient hot-water system, new energy-efficient heating (and cooling) system, draughtproofing and insulation, behavioural and contract switching advice in isolation and combination	DHHS 2019		
Victorian Healthy Homes Program	Reduce energy use	1,000 eligible households, including private renters and low-income households with pre-existing health conditions, in western Melbourne and the Goulburn Valley	Trial—free retrofit and fixed appliance upgrade measures based on a free energy audit and in combination with energy contract-switching advice	Acil Allen 2018		
Future Powered Families (LIEEP)	Reduce energy use	Over 5,000 low-income household families	Energy-saving workshops; home energy assessments (HEAs); training of 392 participants in undertaking home energy assessments	Yang, Martinelli et al. 2016	Y - Only HEA recipients achieved reductions that were statistically significant over the project period	Yang, Martinelli et al. 2016
Glenelg Saves (LIEEP)	Reduce energy use	Home and community care (HACC) clients (16.3% were renters) and staff (13.6% were renters)	Home energy assessments	Western District Health Service 2016	Y - Did not achieve reduction beyond trends already evident	Western District Health Service 2016
Home Energy Efficiency Upgrade Program (LIEEP)	Reduce energy use	793 low-income households in greater Melbourne and regional Victoria (22% were community housing)	2014–16 Installation of new hot-water systems (solar or heat pump) in community housing	BSL 2016	Y - Decreases in daily electricity consumption: electric storage to heat pump (29%); electric storage to gas instantaneous (42%); electric storage to gas solar (41%)	BSL 2016

Name	Purpose	Target population	Notes	Reference	Evaluated (Y/N) and findings	Reference: evaluation report
Koorie Energy Efficiency Project (KEEP) (LIEEP)	Reduce energy use	4,500 Aboriginal people across Victoria	Trial—three types of home visits to provide advice to householders to reduce energy use and address energy-related stress and discomfort; one type included provision of energy-use display monitor	Bedggood, Farquharson et al. 2016	Y - Significant reductions in energy-related stress and discomfort; improved adoption of energy-related behaviours; greater willingness to share knowledge with family and friends; focus on improving competence of householders was of greater benefit than quantitative measurement of energy	Bedggood, Farquharson et al. 2016
Powerdown Project (LIEEP)	Reduce energy use	1,350 low-income households (caravan and cabin parks, retirement estates, etc.) in Northern Victoria	1,032 home energy assessments (HEAs); 1,024 retrofits; and workshops (500 attendees); retrofits included low-cost draughtproofing, electric throw blankets, hot-water service insulation, Eco-switches, fridge thermometers and lighting	GV Community Energy 2016	Y - HEAs reduced electricity use by average 0.61kWh per day, or 6% of average usage; study found that households tended to overstate their comfort levels, with many living in cold houses (winter) and/or hot houses (summer)	GV Community Energy 2016
SECCCA Energy Saver Study (LIEEP)	Reduce energy use	Low-income households—Home and Community Care	Assistance to implement sustainable energy-efficiency practices—combinations of 10 different home retrofits offered	SECCCA 2016	Y - Retrofit only achieved 7% reduction in total energy use and 1–1.9°C increase in winter temperature; retrofit and behaviour change achieved 10–11% reduction in total energy use, 13–18% reduction in gas use, and 1.6°C increase in winter	SECCCA 2016
Northern Grampians (LIEEP)	Reduce energy use	40 aged and disability pensioner households	An in-home energy assessment to: explore current energy use and needs within aged and disability pensioners' households; recommend energy-efficiency upgrades. Installing specific energy-efficiency upgrades (up to \$5,000 per household); ongoing provision of tailored information, advice and feedback on household energy use	Northern Grampians Shire Council 2016	Y - average total savings of 346kWh/ year per household	Northern Grampians Shire Council 2016

Name	Purpose	Target population	Notes	Reference	Evaluated (Y/N) and findings	Reference: evaluation report
Western Australia						
Hardship Efficiency Program (HEP)	Reduce energy use	Customers in hardship	Combination of energy smart advice, education and appliance upgrades (ceiling insulation and energy-efficient hot-water systems)	Government of Western Australia 2008		
Hardship Efficiency Program (HEP)—public and community housing subprogram		Customers in hardship in Regional Western Australia (e.g. Esperance)	Connecting homes of LPG-dependent customers in hardship to the reticulated natural gas network; upgrading old energy-inefficient gas appliances. Other initiatives under the project include installation of insulation in public housing and of efficient hot-water systems in the largest households being connected to the network	Department of Housing and Office of Energy 2012		
Switched on Homes (LIEEP)	Reduce energy use	240 low-income households in Gosnells, Armadale and Shire of Serpentine Jarrahdale.	2015 Voltage optimisation and SMS tips	City of Gosnells 2016	Y - The voltage optimisation group experienced a 14.5% decrease in electricity consumption, but most benefit was gained for those who had solar PV; newer housing stock (post-2000) averaged 35% less electricity consumption than pre-2000 stock, although the gap reduced in winter	City of Gosnells 2016

Source: Authors.

Appendix 2: Australian Housing Conditions Dataset (AHCD) descriptive tables

Table A2.1: Demographic and housing characteristics by tenure

Variable	Category	Private rental	Public rental	Outright owner	Mortgage holder	Other
Gender (%)	Male	47.9	27.8	42.1	44.6	38.6
	Female	52.1	72.2	57.9	55.4	61.4
Age (%)	18–24	5.8	1.5	1.3	2.2	5.7
	25–34	6.4	2.3	0.9	2.5	2.3
	35–44	17.5	5.3	2.5	17.3	10.2
	45–54	26.7	12.0	11.4	36.1	17.0
	55–64	15.6	24.1	25.1	30.4	12.5
	65–74	12.9	21.1	31.8	9.7	11.4
	75+	15.0	33.8	27.0	1.9	40.9
Annual income (%)	Up to \$12,000	3.1	6.0	1.4	0.4	3.4
	\$12,000–20,000	8.9	30.1	8.0	2.7	9.1
	\$20,000–40,000	15.6	18.0	17.3	5.5	12.5
	\$40,000–60,000	10.1	6.8	9.8	8.1	3.4
	\$60,000–80,000	10.4	3.8	7.7	9.3	2.3
	\$80,000–100,000	5.5	1.5	5.6	12.0	4.5
	\$100,000–150,000	6.7	0.8	7.2	16.0	1.1
	\$150,000–200,000	4.6	0.0	3.6	11.2	0.0
	More than \$200,000	3.4	0.0	3.7	8.6	1.1
	Missing	31.6	33.1	35.7	26.2	62.5
Household structure (%)	Couple with no children	15.0	11.3	40.1	19.4	20.5
	Couple with children	23.6	12.0	24.5	59.1	21.6
	Single parent	11.3	16.5	3.8	6.2	4.5
	Lone person	34.7	53.4	25.5	10.0	43.2
	Other family arrangement	7.4	6.0	4.7	4.0	5.7
	Sharing with friends	6.4	0.0	0.3	0.4	2.3
	Missing	1.5	0.8	1.0	0.9	2.3

Variable	Category	Private rental	Public rental	Outright owner	Mortgage holder	Other
Years living in current dwelling	Mean (SD)	8.8 (8.5)	18.2 (12.1)	25.7 (15.0)	16.0 (9.0)	15.1 (11.7)
Number of moves in past 5 years	Mean (SD)	1.0 (1.3)	0.2 (0.7)	0.4 (0.1)	0.2 (0.6)	1.1 (5.0)
Dwelling age	Mean (SD)	43.9 (29.8)	36.0 (16.3)	47.2 (31.3)	45.9 (32.4)	39.0 (27.5)
Dwelling type (%)	Separate house	58.6	42.9	86.6	90.1	62.5
	Semi-detached	15.6	35.3	8.0	6.6	17.0
	Flat or apartment	24.8	21.8	5.2	3.3	12.5
	Other	0.9	0.0	0.3	0.1	8.0
Roof material (%)	Tiles	51.8	66.9	59.3	56.4	61.4
	Metal sheet	31.6	23.3	36.4	41.2	30.7
	Concrete	4.0	2.3	2.5	1.2	0.0
	Missing	12.6	7.5	1.8	1.2	8.0
Wall material (%)	Masonry	79.8	86.5	82.1	80.2	81.8
	Timber	9.8	3.0	9.7	11.2	11.4
	Fibro sheet	6.4	9.0	5.0	5.6	1.1
	Metal sheet	0.9	0.0	1.3	1.2	0.0
	Missing	3.1	1.5	1.8	1.8	5.7
Major building problems (%)	Rising damp	2.8	3.0	1.6	1.3	0.0
	Mould	4.0	4.5	0.6	1.1	0.0
	Cracks in walls or floors	10.1	9.8	5.4	6.6	2.3
	Sinking or moving foundations	2.8	3.8	1.5	2.6	4.5
	Sagging floors	1.5	0.8	0.6	0.9	2.3
	Walls or windows out of plumb	2.5	4.5	0.5	1.1	1.1
	Wood rot or termite damage	0.6	2.3	0.6	0.9	0.0
	Electrical problems	0.9	0.8	0.3	0.5	1.1
	Roof defect	0.9	5.3	1.3	2.0	4.5
	Other	3.1	6.0	1.1	1.5	1.1

Source: The AHCD (Baker, Beer et al. 2019). Note: The “missing” category designates non-responses e.g. “prefer not to state” or “don’t know”.

Table A2.2: Items indicating potential energy hardship, by self-assessed health (private renters)

Variable		Self-assessed health						
		Excellent	Very good	Good	Fair	Poor	Don't know	Refused
Total		19.6	29.4	34.7	9.5	5.5	0.3	0.9
Ability to keep warm in winter (%)	Yes	17.8	26.4	28.8	7.7	4.3	0.3	0.6
	No	1.8	3.1	5.8	1.8	1.2	0.0	0.3
	Missing	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ability to keep cool in summer (%)	Yes	17.5	23.9	26.4	6.4	4.3	0.0	0.6
	No	1.2	3.7	6.1	2.8	1.2	0.3	0.3
	Missing	0.9	1.8	2.1	0.3	0.0	0.0	0.0
Ability to pay energy bills (%)	No problem	1.2	1.8	6.4	2.8	1.2	0.0	0.0
	Couldn't pay	0.9	3.4	3.4	1.5	1.5	0.0	0.0
	No financial strain	17.5	24.2	24.8	5.2	2.8	0.3	0.9
Ability to heat home (%)	Able to heat	1.8	4.9	8.0	4.0	2.1	0.0	0.0
	Unable to heat	0.3	0.3	1.8	0.3	0.6	0.0	0.0
	No financial strain	17.5	24.2	24.8	5.2	2.8	0.3	0.9

Source: The AHCD (Baker, Beer et al. 2019). Note: The “missing” category designates non-responses e.g. “prefer not to state” or “don't know”. The “no financial strain” category captures respondents who reported no financial strain in the screening questions prior to the question about specific forms of financial strain (not reported).

Table A2.3: Items indicating potential energy hardship, by self-assessed health (public housing renters)

Variable		Self-assessed health						
		Excellent	Very good	Good	Fair	Poor	Don't know	Refused
Total		9.0	24.1	33.1	21.8	12.0	0.0	0.0
Ability to keep warm in winter (%)	Yes	6.8	20.3	29.3	15.8	9.8	0.0	0.0
	No	2.3	3.8	3.8	6.0	2.3	0.0	0.0
	Missing	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ability to keep cool in summer (%)	Yes	9.0	21.8	28.6	16.5	9.8	0.0	0.0
	No	0.0	1.5	4.5	5.3	2.3	0.0	0.0
	Missing	0.0	0.8	0.0	0.0	0.0	0.0	0.0
Ability to pay energy bills	No problem	2.3	2.3	5.3	0.8	1.5	0.0	0.0
	Couldn't pay	1.5	2.3	1.5	4.5	1.5	0.0	0.0
	No financial strain	5.3	19.5	26.3	16.5	9.0	0.0	0.0
Ability to heat home	Able to heat	3.0	4.5	6.0	3.0	2.3	0.0	0.0
	Unable to heat	0.8	0.0	0.8	2.3	0.8	0.0	0.0
	No financial strain	5.3	19.5	26.3	16.5	9.0	0.0	0.0

Source: The AHCD (Baker, Beer et al. 2019). Note: The “missing” category designates non-responses e.g. “prefer not to state” or “don't know”.



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