Energy Hardship in Community Housing

Evidence on Thermal Comfort, Housing Conditions and Tenant Behaviour

THERMAL COMFORT

HEALTH IMPACTS

ENERGY AFFORDABILITY

TENANT BEHAVIOUR

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Executive Summary

As purpose-driven organisations, community housing providers (CHPs) are committed to environmental sustainability and improving outcomes for the people they house. However, there are significant challenges to upgrading community housing dwellings within the financial constraints of non-market housing. This report provides a foundation for understanding where and how energy hardship is experienced across the community housing sector, and where targeted improvements in housing quality and energy policy can have the greatest impact.

This report presents findings from a national survey conducted by the Community Housing Industry Association NSW (CHIA NSW) with community housing residents to examine energy hardship, thermal comfort and the ways households manage energy use and costs. It provides a detailed evidence base on how energy costs and the energy performance of dwellings impact resident health, wellbeing and financial stress.

The analysis draws on 1,615 survey responses collected across New South Wales, Victoria and South Australia between August and October 2025. Data was matched to the Australian Building Codes Board (ABCB) climate zones to capture variation across different climatic conditions. Additionally, 528 qualitative comments were thematically analysed to provide further context to the quantitative results.

Energy hardship and housing conditions

Most social housing was built prior to the introduction of minimum energy efficiency standards. Consequently, many dwellings offer limited protection from heat and cold, increasing residents' exposure to unsafe indoor temperatures and reducing their capacity to maintain thermal comfort without relying on energy intensive and costly coping strategies. Importantly, community housing providers operate within diverse ownership and management arrangements, and in many cases manage dwellings they do not own, limiting their direct control over building fabric, major infrastructure upgrades, and long-term asset renewal. An increasing proportion of community housing providers' budgets is being directed to maintaining an ageing social housing portfolio. The nature of community housing, with rents below market rates, limits the ability of providers to generate additional funds for energy performance upgrades.

Across the survey sample, substantial numbers of residents reported they felt exposed to unsafe indoor temperatures and frequent thermal discomfort. Almost one quarter of residents indicated they felt their home felt unsafe for several months of the year, while one in ten felt they experienced unsafe temperatures almost every month. These experiences were reported across all climate zones, indicating that energy hardship is not confined to particular regions or weather conditions.

Housing features also played a key role in shaping resident experiences. Households which reported having none of the listed heating or cooling fixtures in the survey – such as air conditioning or ceiling fans – installed in their home (comprising over a third of respondents), were more likely to feel experience unsafe temperatures, worse thermal comfort and greater temperature-related health impacts. These residents relied heavily on portable heaters and fans, as well as behavioural strategies to maintain comfort, such as wearing extra layers, taking hot or cold showers and changing routines. Despite this, households who lacked fixed systems experienced higher levels of energy hardship, with 39 percent reporting they struggled often or always to pay their energy bills, compared to a third of those with fixed systems. However, the presence of fixed heating and cooling alone does not guarantee thermal comfort. Even where fixed systems were installed, many households reported limiting their use due to the high cost of energy.

Thermal discomfort was widely reported in both summer and winter. Many residents indicated that the cost of energy prevented them from keeping their home at a comfortable temperature, particularly during periods of extremely hot or cold temperatures. A significant proportion (54%) reported that the temperature of their home had worsened their own health or the health of other household members.

Energy affordability and financial stress

Almost two-thirds of total residents reported struggling to pay their energy bills in the past year, and more than one-third reported this often or always occurred. Rising energy prices led many households to reduce use of heating and cooling systems, avoid using appliances and cut back on essential spending such as on food or medicine.

More severe coping strategies were also reported. Some residents limited the number of hot meals they cooked or left their home to seek more comfortable environments, whilst a smaller portion missed rent payments in order to manage energy costs. These behaviours were evident across households with and without the installed systems listed in the survey. However, households with none of the listed heating and cooling features were more likely to report a range of coping behaviours, suggesting they experienced greater need to modify their everyday practices to manage energy costs and comfort.

Groups experiencing higher levels of hardship

Energy hardship was not evenly distributed across the sample. Aboriginal and or Torres Strait Islander residents, larger households, and very low-income households were more likely to report frequent difficulty paying energy bills.

Across all age and cultural groups, levels of understanding of energy bills and costs were limited. Fewer than half of residents reported understanding how their bills were calculated or having enough information about their energy use and costs. Many also reported challenges in understanding written billing information (35%), and a large proportion indicated that they would like to receive more information from their provider about understanding and management of their energy and bills.

Conclusion

This report provides a detailed picture of energy hardship within Australia's community housing sector. The findings show that many residents experience ongoing difficulty maintaining safe and comfortable indoor temperatures while also managing the cost of energy. These challenges are closely linked to housing conditions, property features and affordability, and are reflected in widespread use of coping strategies that can impact residents' health, wellbeing and financial security.

The results of the survey point to the importance of improving the energy performance of community housing, including insulation, ventilation and efficient heating and cooling systems, alongside the provision of clearer information and support for residents to understand and manage their energy use.

The findings also highlight the need for the sector to routinely measure and monitor energy hardship and thermal comfort outcomes. Embedding these indicators within ongoing tenant data collection would strengthen the evidence base for investment decisions, enable evaluation of retrofit programs, and support a more coordinated sector response. Treating energy hardship as a systemic issue within the housing system, rather than an individual household or provider-level problem, will be critical to improving accountability, informing advocacy, and directing resources where they can have the greatest impact.

Social housing residents are particularly vulnerable to the impacts of climate change and energy hardship. Improving energy performance of homes and energy affordability is critical to reducing exposure to unsafe temperatures, tackling housing affordability, and improving outcomes for community housing residents.

Summary

Key findings

1 Energy hardship is widespread

- Nearly two-thirds of community housing residents struggled to pay energy bills in the past year
- Over one-third experienced bill stress often or always
- Over 70 percent of residents experienced uncomfortable indoor temperatures in both summer and winter due to energy costs
- 44 percent of residents perceived temperatures inside the home were unsafe or unhealthy for several months each year

2 Housing conditions are a major driver

Like many homes, most social housing properties were delivered before minimum energy efficiency standards were introduced. Providers are partnering with government to upgrade properties as opportunities arise, funding constraints, ageing housing stock, competing maintenance demands, and complex ownership arrangements can limit the scale and pace of upgrades. In this context, findings show:

- Around one-third of surveyed households did not report any fixed heating or cooling features.
- Compared with households that had installed systems, households with none of the listed systems were more likely to report:
    - Feeling that their home was at an unsafe temperature
    - Greater reliance on portable heaters and fans
    - Higher levels of energy bill stress
    - More temperature-related health impacts
- Even where heating and cooling systems were installed, many residents reported limiting their use due to energy costs.
- Residents also linked thermal discomfort to broader housing conditions, including poor insulation, ventilation, dwelling orientation, and ageing building stock.

3 Health and wellbeing impacts are significant

- 54% of residents reported indoor temperatures worsened their health in some capacity
- Reported impacts included:
    - Exacerbation of chronic illness

  - Poor sleep
  - Mental health stress
  - Reduced daily functioning
- Households with fixed heating, cooling and solar features generally reported better thermal safety and fewer temperature-related health impacts.

4 Residents used a range of coping behaviours, including:

- Heavy reliance on portable heaters and fans
- Wearing additional clothing indoors
- Limiting appliance use or cooking
- Closing off rooms or sleeping in different areas
- Leaving the home during extreme temperatures
- Some residents reported missing rent or essential expenses to pay energy bills

5 Financial stress leads to trade-offs

- Residents reported cutting spending on food, medication, and essentials to pay energy bills
- Common responses to bill stress included:
  - Payment plans (36%)
  - Delayed or missed payments (26%)
  - Borrowing money (21%)

6 Hardship is not evenly distributed

- Energy and financial hardship were more commonly reported among:
  - Aboriginal and/or Torres Strait Islander households
  - Very low-income households
  - Larger households
  - Residents in detached dwellings

7 Risks are experienced across climate zones and seasons

- Energy hardship occurred across all climate zones, indicating it is not confined to colder or hotter regions
- Perceived unsafe indoor temperatures were reported across multiple climate zones
- Seasonal risks vary by zone, while poor insulation, ageing housing stock, and limited heating or cooling infrastructure were commonly identified as contributing to thermal discomfort.

8 Information and support gaps remain

- Fewer than half of residents understand how their energy bills are calculated
- Many want clearer information on tariffs, pricing, and available assistance
- Demand exists for proactive energy education and support from both housing providers and energy retailers

Overall implications

- Energy hardship in community housing is structural, driven by:
    - Ageing and inefficient housing stock
    - Inadequate heating and cooling infrastructure
    - High and volatile energy prices
    - Limited resident control over dwelling upgrades
    - Non-ownership of dwellings limits providers' control over major capital upgrades
    - Community housing providers have limited capacity to independently fund large-scale retrofit programs, highlighting the need for ongoing government investment
    - Short-term supports reduce immediate distress but do not address the underlying drivers of risk
- Despite financial assistance and programs, affordability constraints persist, meaning:
    - Retrofit programs must be paired with pricing reform, concessions, and bill protections
    - Building upgrades should prioritise insulation and building fabric performance, not only appliances

Future priorities

- Scale up investment in energy retrofits across community housing, prioritising insulation, building fabric performance, shading, and climate-appropriate fixed heating and cooling
- Pair infrastructure upgrades with ongoing energy affordability measures, including concessions, tariff protections, and targeted bill relief for low-income households
- Introduce or strengthen minimum thermal performance standards for social and community housing to ensure safe indoor temperatures year-round
- Align funding, regulatory, and asset settings to enable upgrades in community housing properties not owned by providers
- Improve data collection and monitoring of energy hardship and housing energy performance to track outcomes and guide future investment
- Support targeted programs for high-risk households and climate-zone-specific retrofit approaches to ensure equitable and effective policy responses

1 Introduction

1.1 Project scope

In early 2025, Australian Community Housing (formerly Community Housing Industry Association) received a grant from the Melbourne Lord Mayor's Charitable Fund (LMCF) to investigate energy hardship within the community housing sector. To inform this initiative, Presync Consulting was commissioned to undertake a comprehensive review of national and international approaches to measuring energy hardship. Their review analysed over 26 global studies, identifying key definitions, frameworks, and methods relevant to survey development.

Building on this work, the Community Housing Industry Association NSW (CHIA NSW) was commissioned to design and implement a national survey of community housing residents to establish a benchmarked understanding of energy hardship across the sector. This report presents the survey findings and provides an evidence base on the prevalence, nature, and impacts of energy hardship among community housing residents, supporting sector-wide advocacy for long-term, well-resourced energy efficiency upgrades across social and community housing.

1.2 Research approach

This project employed a primarily quantitative research approach to establish a baseline understanding of energy hardship among community housing residents across Australia. The primary data collection comprised an online survey, supported by analysis of secondary data to contextualise findings.

1.2.1 Survey design

The survey was designed by CHIA NSW, drawing on conceptual frameworks identified in Presync Consulting's review of national and international energy hardship measurement approaches. The survey was structured to capture a comprehensive range of factors associated with energy hardship and risk among community housing residents. This included questions on resident demographics including age, gender, cultural background, household composition, and dwelling characteristics, followed by questions on energy sources, energy use and behaviour, thermal comfort, and affordability. The survey also examined residents' knowledge and understanding of energy bills and related costs.

The survey was built on surveying platform Snap Surveys. The survey included a total of 20 quantitative and qualitative questions. Qualitative elements included Likert scale questions and one open-ended written response, whilst quantitative elements included both single and multiple-choice questions. The survey was only provided in English.

1.2.2 Sampling and data collection

In June 2025 an expression of interest was circulated to community housing members of Australian Community Housing, inviting them to participate in the pilot study. Nine community housing providers (CHPs) in NSW, Victoria and South Australia agreed to participate in the pilot study. Of the participating providers, six were based in NSW, two were based in South Australia and one was in Victoria. Through these providers, approximately 12,680 households were invited to complete the survey. A total of 1,715 residents across the pilot sample responded. Of this total, 1,618 were valid responses, completing more than 80 percent of the survey, including the mandatory question asking for their postcode and also completing questions related to thermal comfort. Based on the valid response rate, survey results have a margin of error of approximately ±2.3 percentage points at a 95 percent confidence level, assuming maximum variability ($p = 0.5$), for estimates based on the full sample, however margin of error figures differ depending on the total number of responses per question.

Participating CHPs were responsible for the dissemination of the survey. Residents were invited to participate through multiple channels, including email, SMS, and via phone call, ensuring accessibility across diverse resident cohorts. Participation was voluntary, and respondents were informed that their individual responses would remain confidential and be reported in aggregated form only.

Survey fieldwork was undertaken between 25 August and 27 October 2025.

1.2.3 Data analysis

Survey data was cleaned, validated, and analysed using both Microsoft Excel and Snap Surveys software. Cross-tabulations were used to identify patterns of energy hardship across key demographic and dwelling characteristics. Variables such as household income, tenure type, and self-reported energy stress were examined to assess correlations with housing type, region, and dwelling performance.

Further analysis incorporated the Australian Building Codes Board (ABCB) Climate Zone Map to account for climatic variations across different regions. Each respondent's postcode was mapped to its corresponding climate zone, allowing for comparison of survey indicators by climatic conditions. This enabled examination of how factors such as temperature and climatic variability may influence reported experiences of thermal comfort, energy consumption, and affordability for participating residents.

At the conclusion of the survey, participants were invited to share written comments regarding energy in their home. These written comments were thematically analysed utilising NVivo software. A total of 528 written comments were received.

1.2.4 Geographical scope

According to the Australian Building Codes Board, there are eight climatic zones, described as follows:

- Climate zone 1 - high humidity summer, warm winter
- Climate zone 2 - warm humid summer, mild winter
- Climate zone 3 - hot dry summer, warm winter
- Climate zone 4 - hot dry summer, cool winter
- Climate zone 5 - warm temperate
- Climate zone 6 - mild temperate
- Climate zone 7 - cool temperate
- Climate zone 8 - alpine

As seen in Figure 1, climate zones cover diverse geographies.

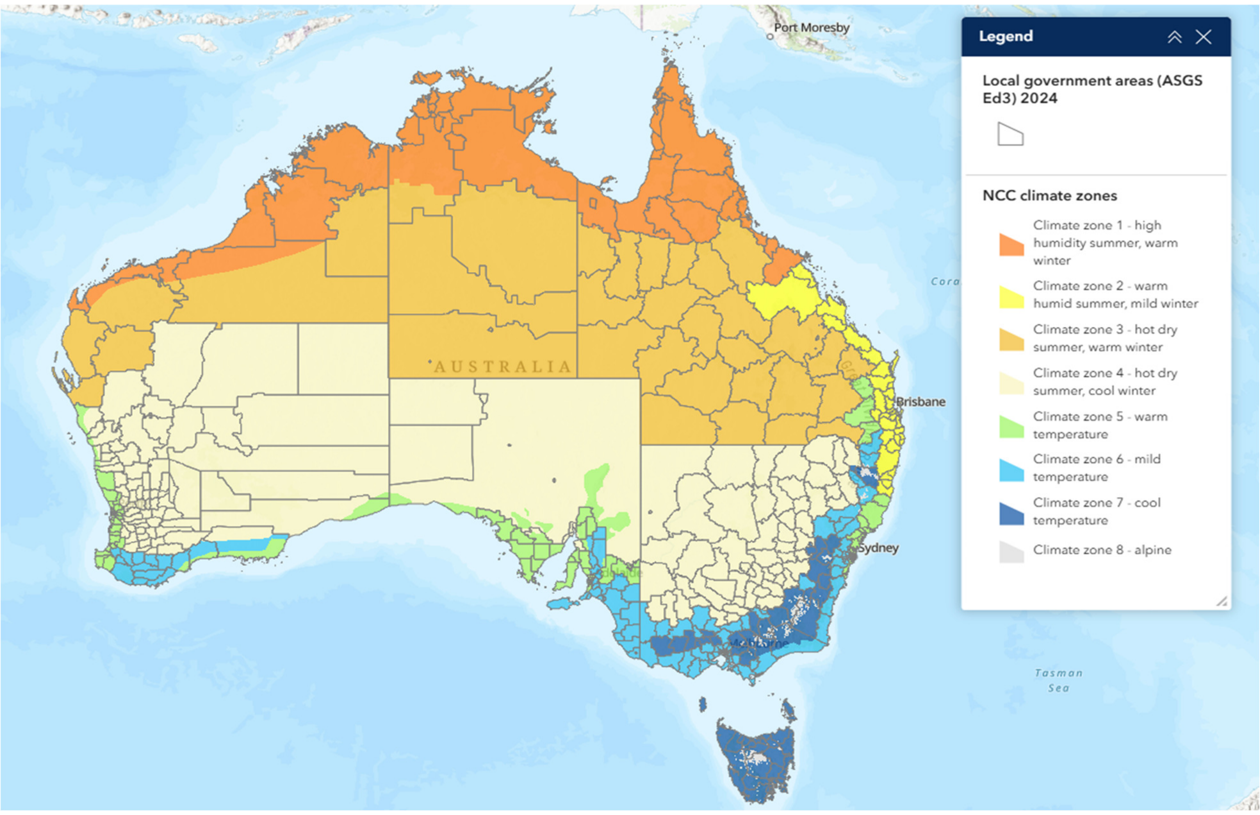

Figure 1. ABCB Climate Map. Source: Australian Building Codes Board (2024)

Climate zones 4, 5, 6 and 7 were represented within the survey responses (see Figure 2). Of these, 17 percent were in Zone 4, 46 percent in Zone 5, 32 percent in Zone 6 and 6 percent in Zone 7.

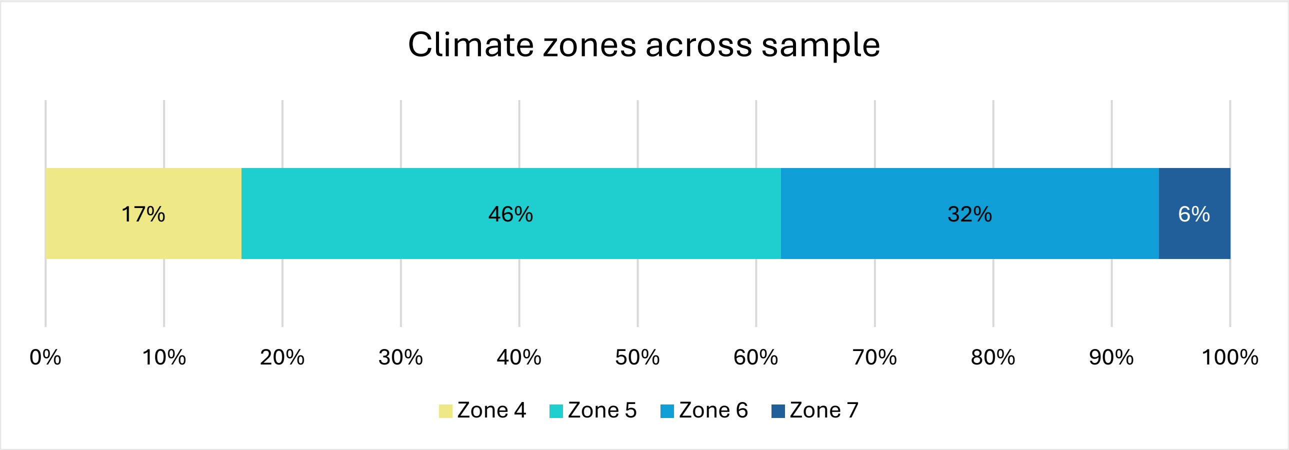

Figure 2. Climatic zones in survey response sample (n=1618)

In exploring the distribution of climate zones across states, the majority (82%) of Victorian respondents were in Zone 6, whilst the majority (98%) of South Australian respondents lived in Zone 5. In NSW, there was a greater distribution across climatic zones, with the majority (47%) within Zone 5, followed by 28 percent in Zone 6, 18 percent in Zone 4 and 6 percent in Zone 7.

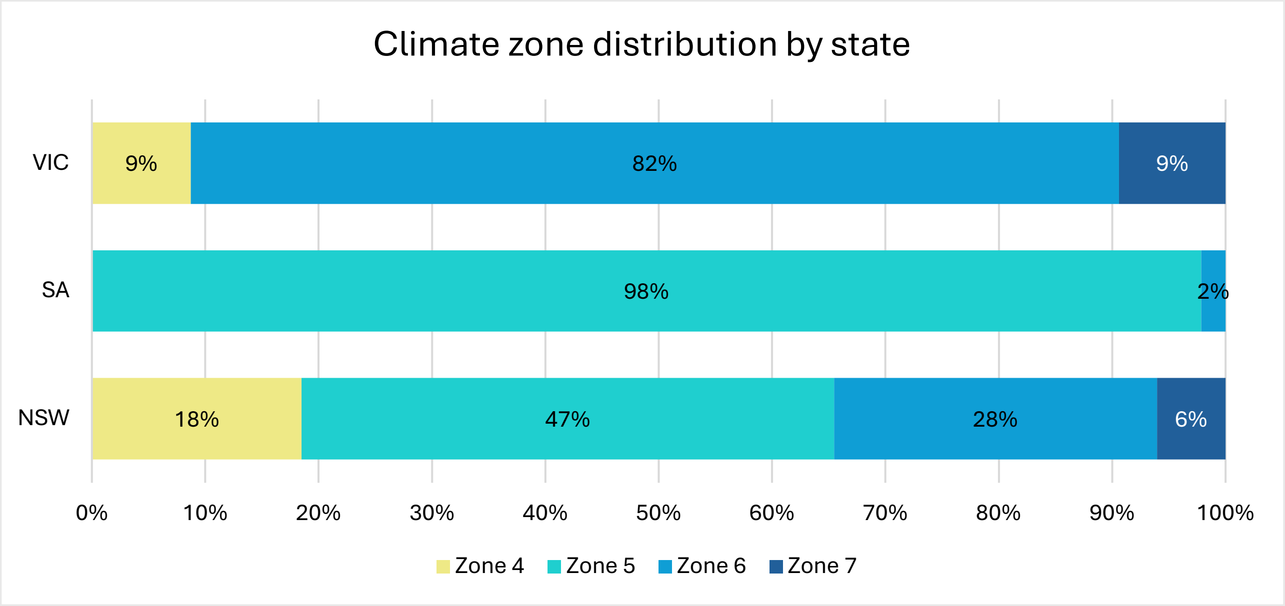

Figure 3. Climate zone distributions by state (n=1618)

In order to provide context for survey responses during late August to October (late winter and early-mid spring), weather conditions across each climate zone were reviewed using Bureau of Meteorology data. Artificial Intelligence was used to assist with cross-checking and summarising this information. A summary of these findings is provided in Table 1. It is important to note that this is not necessarily a precise representation of weather conditions within each postcode surveyed, but a broad overview to contextualise survey findings. Additionally, this table presents contextual climatic conditions and is not derived from survey responses.

<table>
<tr><th>State</th><th>Climate Zone</th><th>Weather conditions</th></tr>
<tr><td rowspan="4">NSW</td><td>Zone 4</td><td>Locations: North-west and central west NSW – including Tamworth Regional, Dubbo, Parkes, Inverell, Narrabri, Moree Plains, Forbes, and Gunnedah.

September: Mild to warm days (around 22-25 °C) and cool nights (8-12 °C). A few early frosts in the first half of the month. Scattered showers or storm activity occasionally occur, with rainfall typically light to moderate.

October: Warm and mostly dry conditions dominate. Average maxima climb to 25–28 °C with some hot days exceeding 30 °C. Nights become milder (10–15 °C). Rainfall is generally below average, with brief storm events later in the month.</td></tr>
<tr><td>Zone 5</td><td>Locations: Coastal and near-coastal NSW – including Sydney, Newcastle, Wollongong, Gosford, Lake Macquarie, Central Coast, Sutherland Shire, and the Lower Hunter.

September: A wetter than average start to spring, especially in Greater Sydney and along the Illawarra coast. Temperatures are mild (daytime highs around 18–22 °C; nights 10–13 °C). Several rain events and onshore winds contribute to higher humidity.

October: Transition to warmer, drier weather with daytime temperatures in the low- to mid-20s °C and reduced rainfall. A few early-season heat spikes (high-20s °C) occurred, particularly inland from the coast.</td></tr>
<tr><td>Zone 6</td><td>Locations: Inland and elevated NSW – including Western Sydney fringe (Parramatta, Penrith, Blacktown), Southern Highlands, Shoalhaven, Bega Valley, Wollondilly, and Mudgee.

September: Mild to cool start to spring with passing fronts and patchy rain. Daytime temperatures average 17–21 °C, with cooler nights (6–9 °C). Rainfall is variable, mostly from frontal systems.

October: Generally warmer and drier than average. Daytime temperatures 22–26 °C; some warm, windy days raise fire-weather risk. Rainfall often below average, with isolated thunderstorms later in the month.</td></tr>
<tr><td>Zone 7</td><td>Locations: Tablelands and higher-altitude regions – including Armidale, Orange, Bathurst, Lithgow, Cooma-Monaro, Snowy River, Bombala, and the Northern and Central Tablelands.

September: Cool to mild days (14–18 °C) and cold nights (3–6 °C). Occasional frost and showers, particularly in elevated areas. Some snow possible in the alpine region early in the month.

October: Becoming milder but still cool relative to the coast. Average highs 17–22 °C, lows 5–9 °C. Rainfall variable but mostly near or below average; occasional showers or thunderstorms.</td></tr>
</table>

VIC	Zone 4	Locations: Northern and north-western Victoria – including Mildura, Swan Hill, Gannawarra, Buloke, Loddon, and parts of Campaspe and Greater Bendigo. **September:** Warm spring onset with mild to warm days (21–24 °C) and cool nights (7–10 °C). Rainfall is light to moderate (20–40 mm), occasionally from weak fronts. Conditions often dry and sunny. **October:** Warmer and drier overall. Average maxima around 25–28 °C, with several hot days above 30 °C. Rainfall generally below average, increasing dryness through late October.
VIC	Zone 6	Locations: Central and southern inland Victoria – covering Greater Melbourne, Geelong, Ballarat, Bendigo, Shepparton, and the Yarra Valley. **September:** Typical early-spring pattern of alternating mild spells and cool fronts. Daytime temperatures mostly 15–20 °C, nights 6–9 °C. Periodic rain and wind, rainfall near average (40-60 mm). **October:** Warmer and generally drier than September, though still variable. Daytime highs 20-25 °C with some warm, windy days. Rainfall decreases overall, with late-spring rainfall more commonly associated with showers and thunderstorms.
VIC	Zone 7	Locations: Higher elevations – including Central Highlands, Macedon Ranges, Dandenong Ranges, Great Dividing Range, and the Victorian Alps. **September:** Cool to mild days (12–17 °C) and cold nights (2–6 °C). Frequent showers, cloud, and occasional frost. Snow persists in alpine areas early in the month. **October:** Gradual warming, though still cooler than lowland Victoria. Average maxima 17–21 °C, minima 5–8 °C. Rainfall typically near or slightly below average.
SA	Zone 4	Locations: Northern and inland South Australia – including Whyalla, Port Augusta, Port Pirie, the Riverland (Renmark, Loxton, Berri), and northern parts of the Eyre Peninsula. **September:** Warm days (22–26 °C) and cool nights (8–11 °C). Mostly dry with occasional showers from weak cold fronts. Rainfall typically below 25 mm across most areas. **October:** Becomes notably warmer and drier. Average maxima 27–31 °C with some hot spells exceeding 35 °C in the north. Rainfall generally low.
SA	Zone 5	Locations: Coastal and lower-elevation regions — including Adelaide metropolitan area, Mount Barker, Barossa Valley, and southern Fleurieu Peninsula **September:** Mild, variable weather with alternating frontal systems and dry spells. Daytime temperatures average 18–21 °C, nights 8-10 °C. Rainfall near average (40–60 mm), concentrated in the first half of the month. **October:** Warmer and drier overall, with daytime temperatures 22-26 °C and decreasing rainfall (20-40 mm). Some early warm days exceeded 30 °C inland from the coast.
SA	Zone 6	Locations: Southern and elevated parts of the state - including Mount Gambier, Naracoorte, the Limestone Coast, and southern Yorke and Eyre Peninsulas. **September**: Cool to mild days (15–19 °C) and cold nights (5–8 °C). Showers frequent near the coast, rainfall around 50-80 mm. **October:** Milder conditions, though still cooler than inland SA. Average maxima 19–23 °C, minima 7–9 °C. Rainfall declines to approximately 30–50 mm.

Table 1. Summary of weather conditions in climate zones by state

2 Understanding Energy Hardship and the Community Housing Sector

In Australia, energy hardship (or energy poverty) is increasingly recognised as a critical social and public health issue, shaped not only by household income but also by the performance of the housing stock itself. Energy hardship can be understood in many ways, including fuel poverty, inadequate resources (i.e. financial or assets), and limited capacity to meet essential energy costs. Although multiple definitions exist, within the Australian context, energy hardship is most commonly understood as the inability to afford sufficient heat, electricity, or related energy services (Lowans et al., 2021).

Whilst a useful definition, energy hardship extends beyond financial constraints alone and must also incorporate considerations of energy efficiency, particularly in the context of this report, as most social housing was built prior to the introduction of minimum energy efficiency standards. Consequently, households are more likely to live in homes that are poorly insulated and contain older, higher energy consumption appliances (ACOSS, 2012; Daniel et al., 2020). These structural conditions mean that such households often require more energy to achieve basic levels of comfort, often resulting in higher bills, even when energy prices remain stable (Daniel et al., 2020). Further, many low-income households are not signed up to the most cost-effective energy plans, leaving them more exposed to price increases during peak periods (Uddin et al., 2021). These factors significantly increase the likelihood of households experiencing energy hardship.

Alongside measuring a household’s ability to pay for energy, the concept of thermal comfort is often used to understand a household’s experience of energy hardship. Thermal comfort refers to the combined effects of indoor temperature, humidity, radiant heat, and air movement, moderated by a person’s clothing and level of physical activity (Watts, 2010).

While environmental conditions such as temperature, humidity, radiant heat and air movement can be measured objectively, thermal comfort is ultimately a subjective experience (Schweiker et al., 2018; Yang et al., 2024). In the context of indoor thermal comfort, ‘sensation’ refers to the physiological responses to thermal stimuli, such as changes in skin temperature or sweating, while ‘perception’ encompasses individuals' subjective experiences and interpretations of these responses (Yang et al., 2024). Thermal comfort is therefore influenced not only by measurable environmental conditions, but also by psychological, behavioural and cultural factors that shape how individuals experience their indoor environment (ASHRAE, 2023; Azzazy et al., 2025). This means that people experiencing the same physical conditions may perceive them differently depending on factors such as their health, age, expectations, previous experiences and ability to adapt to indoor temperatures (Azzazy et al., 2025; Zhang et al., 2025). In this context, perceptions of thermal comfort are therefore an important measure of housing performance, as they capture how residents experience indoor conditions and whether temperatures are considered acceptable, uncomfortable or potentially unsafe (Perez-Bezos et al., 2023).

The World Health Organisation (WHO) recommends a minimum indoor temperature of 18 degrees Celsius for general populations living in colder climates or seasonally cold temperatures. However, higher minimum temperatures may be necessary for vulnerable groups, such as children, the elderly (or older people), and those with chronic illness (Geddes et al., 2011; Janssen et al., 2022). When indoor temperatures consistently fall below this threshold, evidence demonstrates an increase in respiratory and cardiovascular illnesses, as well as mortality (Thai et al., 2018).

With respect to heat, seasonal or otherwise, there is no global consensus on a safe maximum indoor temperature. However, research indicates that adverse health impacts become significant at 30-32 degrees Celsius, and vulnerable groups can suffer impacts at 28-30 degrees Celsius (Mavrogianni et al., 2024). Heat stress is the leading cause of weather-related mortality, exacerbating underlying illnesses such as cardiovascular or respiratory diseases, impacting mental health, as well as increasing risks of infection transmission (WHO, 2024).

Australia is often characterised as having some of the least climate-responsive housing stock in the Global North (Moore et al., 2019; O'Leary et al., 2016). Australia's diverse climate and geographical sprawl mean that properties need to be resilient to varied climates and weather events, including floods, heatwaves, fires, and cyclonic weather. Despite this, much of Australia's housing stock is reputed to be inadequately equipped to maintain consistent thermal comfort (Horne & Hayles, 2008). This reputation is not unfounded, with evidence indicating indoor winter temperatures across many Australian homes average below 18 degrees Celsius (Lang, et al. 2024). Dwellings constructed before 1990 are more likely to record winter temperatures below this threshold than those built more recently (Lang, et al. 2024). Recent data indicates that homes built after 2010 have a median NatHERS (Nationwide House Energy Rating Scheme) star rating of 5.9 out of 10, compared to a median of 2.8 stars for homes built prior to 2010 (Corelogic, 2024).

High summer temperatures also present significant challenges for Australian housing stock, as many dwellings heat up quickly, retaining heat for long periods, or lack passive cooling designs that can reduce indoor temperatures (Hatvani-Kovacs et al., 2016; Moore et al., 2019). This can be intensified in dense urban areas with limited foliage cover, where built surfaces trap heat, increasing temperatures further (Imran et al., 2021; Yenneti et al., 2020).

Whilst air conditioning is often posed as a solution to reduce thermal discomfort within homes, as Moore and colleagues (2017) highlight, growing reliance on air conditioning not only increases household energy bills, but also impacts peak electricity demand, and similarly has environmental impacts, often increasing outdoor temperatures (Santamouris, 2014; Liu et al., 2025). This is a relevant concern, given projections of more frequent and severe heatwaves in Australia, which will place vulnerable households at greater health and financial risk (Nicholls & Strengers, 2018).

Evidence also suggests that current building standards do not consistently prioritise heat-stress resistance, meaning that many dwellings remain reliant on electricity-powered cooling to maintain safer indoor temperatures during heat events (Hatvani-Kovacs et al., 2016). As a result, researchers argue that improving thermal performance and designing more climate-responsive housing is essential to reducing dependence on energy intensive appliances and increasing resilience under escalating climate conditions (Moore et al., 2017; Hatvani-Kovacs et al., 2016).

When considered in the context of community housing, international evidence indicates that energy poverty disproportionately affects lower-income households, a pattern that is reflected in Australia (Chandrashekeran et al., 2024; Vera-Toscano & Brown, 2022). Whilst social and affordable housing accounts for just 4.1 percent of Australia's housing stock (AIHW, 2025), of which community housing comprises approximately 32 percent (CHIA NSW, 2026), residents within this sector are disproportionately affected by energy hardship. Research indicates that structural housing conditions, including dwelling age, energy performance and infrastructure limitations, play a central role in shaping residents' thermal comfort and energy use (Sansom et al., 2023). Recent evidence highlights that many existing social and affordable housing properties, the average age of which is 32 years (CHIA NSW, 2025), remain energy inefficient as providers face significant barriers to undertaking upgrades, including constrained capital budgets, limited organisational capacity, and the high upfront cost of retrofitting insulation, ventilation, or energy-efficient appliances (Liu et al., 2020; Sansom et al., 2023; Wei et al., 2024). Additionally, a significant proportion of this housing stock predates contemporary energy performance standards and is frequently located in areas exposed to climatic extremes, with building characteristics that include limited insulation, inadequate ventilation, and designs poorly suited to current conditions (Daly et al., 2021; Santamouris et al., 2015; Wei et al., 2024).

Supporting this, temperature monitoring across nine social housing dwellings in Greater Sydney found that all households experienced indoor temperatures above 29 degrees Celsius, with some exposed to temperatures above 35 degrees Celsius over consecutive days (Pfautsch et al., 2026). Unsafe indoor temperatures were recorded across multiple housing types and locations, suggesting that overheating is a broader challenge within social housing, rather than confined to isolated properties or extreme weather events. The study also projected that the number of days exceeding 29 degrees Celsius indoors could more than double under future climate warming scenarios, highlighting growing thermal risks for social housing residents (Pfautsch et al., 2026).

These findings highlight that poor thermal performance is not just a symptom of ageing housing stock but also reflects longstanding structural barriers to investment and renewal within the sector. Decades of under-investment by successive governments, complex funding arrangements, and restrictions on capital renewal have reduced providers' capacity to undertake large scale energy performance upgrades (Baker, 2021; DPIE, 2021). Within the community housing sector, responsibility for dwelling condition and upgrade capacity is further shaped by ownership structures, with many providers managing housing assets owned by government or other entities, constraining their ability to independently undertake major energy performance upgrades (Liu et al., 2026).

There is growing recognition that housing quality, thermal comfort and energy affordability are interconnected policy challenges requiring systemic intervention beyond individual retrofit programs. The NSW Government, as part of its Consumer Energy Strategy, is currently investigating the implementation of mandatory disclosure and minimum energy efficiency standards for rental properties. The state government is also partnering with the Commonwealth Government on the Social Housing Energy Performance Initiative, which is seeking to upgrade 24,000 social housing homes by 2027. Whilst promising initiatives aimed at improving the energy performance of Australia's social housing, international evidence and experience demonstrate that significantly more sustained investment in social housing is essential to enhancing the sector's energy profile (Ascione et al., 2024; Larkin et al., 2025). Against this backdrop, it becomes increasingly important to explore how energy hardship is situated within community housing, and how organisational practices, funding structures, and housing design influence residents' everyday experiences.

3 Survey Findings

3.1 Dwelling use

In understanding how many hours were spent in their property, and the impacts this may have on thermal comfort, residents were asked to indicate approximately how many hours during the week and the weekend (including overnight) that they spent in their home.

The majority spent more than 20 hours per day on average in their home throughout both the week (42%) and the weekend (44%). Only a small number spent less than 8 hrs in their homes during weekdays (10%) and on weekends (8%).

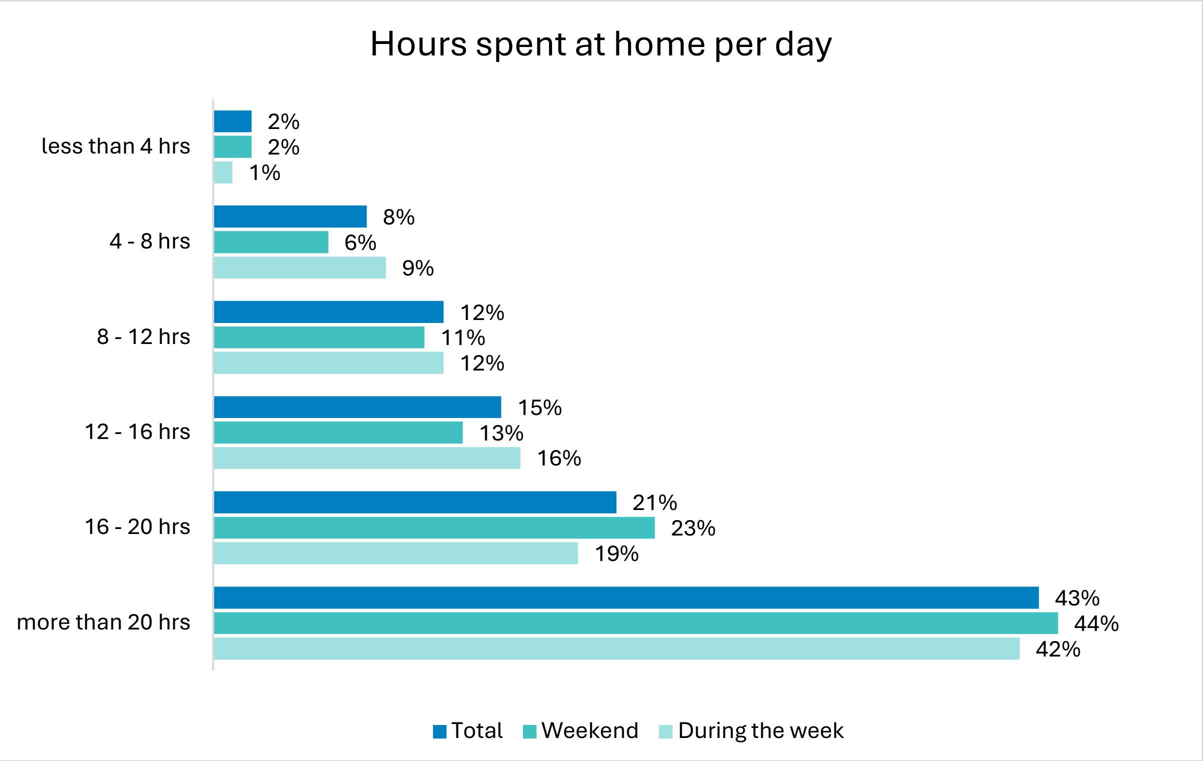

Figure 4. Hours spent at home on weekdays and weekends (n=1602)

To explore these habits further, data on hours spent at home per day was cross tabulated with demographic data, including age, gender, and cultural background (available in Appendix D). In summary, time spent at home increased with age, with residents aged 76 and over most likely to report spending more than 20 hours per day at home. By gender, women and non-binary residents were more likely than men to spend 20+ hours at home during both weekdays and weekends. By cultural background, Aboriginal and/or Torres Strait Islander residents and those born in Australia were more likely than migrants to report spending extended hours at home, with similar patterns observed on weekdays and weekends.

3.2 Household energy characteristics

Survey participants were also asked to report the types of energy used in their homes for heating, cooling, and cooking. Across these household activities, electricity was the most commonly reported energy source, with 91% of surveyed households using electricity for at least one function (heating, cooling, or cooking) (see Figure 5). For households who indicated they had gas appliances (n=567) this was most commonly used for cooking whilst only a very small proportion used solid fuel (n=36) which was exclusively used for heating.

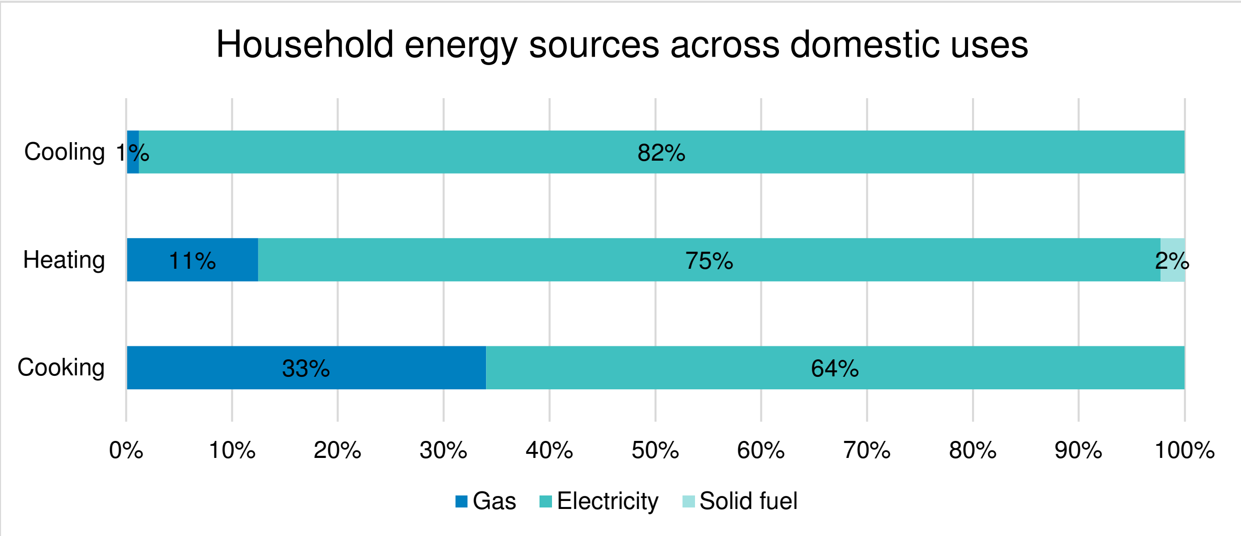

Figure 5. Reported household energy sources and domestic use (n=1574)

Participants were asked to identify the types of heating and cooling fixtures installed in their homes. A total of 44 percent reported having air conditioning, while 35 percent indicated that none of the listed heating or cooling systems were installed. Of the total, 24 percent had ceiling fans, 11 percent had a fixed heating system whilst 8 percent reported having solar panels and 4 percent had a solar hot water system.

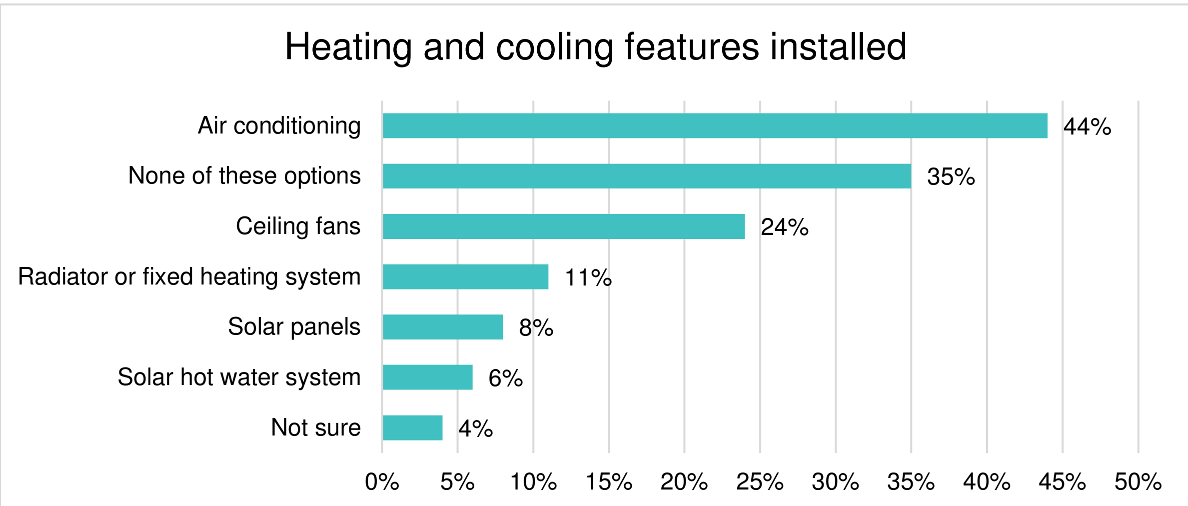

Figure 6. Heating and cooling systems installed in participants' property (n=1608)

For analytical purposes, responses from Figure 6 were grouped into nine categories to support clearer interpretation, as many households reported having multiple energy features installed. These categories were developed by grouping individual response combinations according to the primary types of heating, cooling, and energy-related infrastructure reported. For example, households reporting air conditioning only were grouped separately from those reporting combinations of fixed systems (such as air conditioning, ceiling fans and/or fixed heating) or combinations that included solar technologies. A detailed breakdown of these groupings is provided in Appendix E.

An important note is that the category "none of these options installed" refers to households that did not report any of the features listed in the survey. This category should not be interpreted as indicating the absence of all heating, cooling, or energy-related features, as some households may have had features not captured by the survey or that respondents were unaware of. However, it may also reflect dwellings with no installed heating or cooling systems.

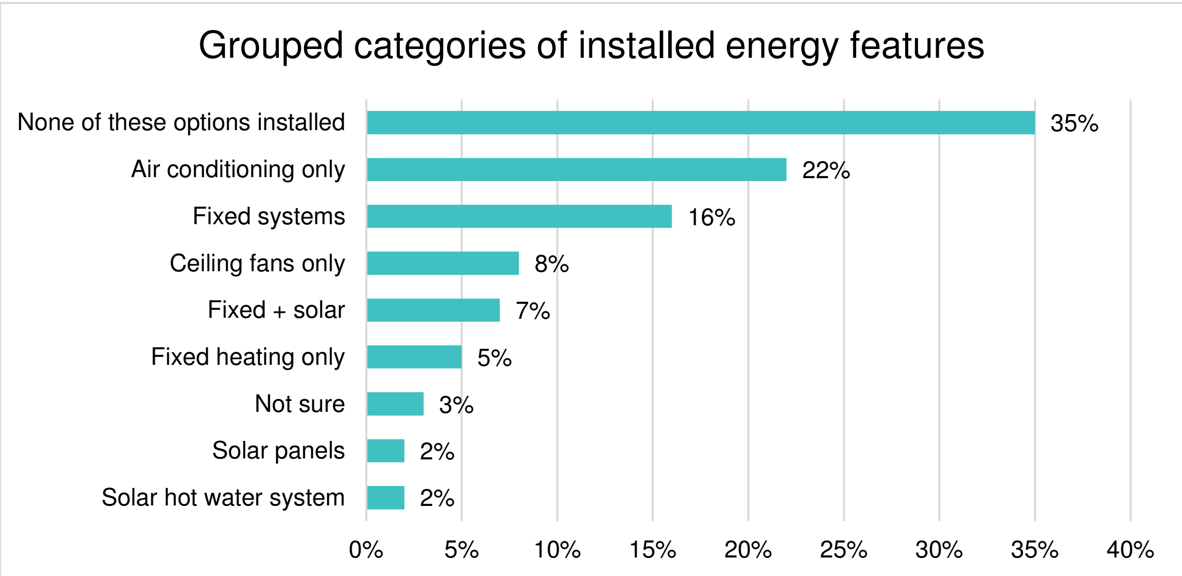

Figure 7. Grouped categories of installed energy features (n=1608)

As Figure 7 shows, the largest share of households reported having none of the listed options installed (35%), followed by those with air conditioning only (22%) and fixed systems (16%). Smaller proportions reported having ceiling fans only (8%), fixed systems combined with solar (7%), or fixed heating only (5%), while relatively few households reported solar hot water systems only (2%), solar panels only (2%), or were unsure (3%).

The distribution of installed energy features varied across climate zones (see Table 2). When examined as a proportion of households within each climate zone, air conditioning only was the most commonly reported installed feature across all zones, ranging from 16% of households in

Zone 7 to 25% in Zone 6. Fixed systems were also common, particularly in Zones 5 (17%) and 6 (19%). Households in Zone 4 were more likely to report having both fixed and solar systems (20%) than households in other climate zones, while fixed heating was most prevalent in the cooler Zone 7 (21%).

A substantial proportion of households across all climate zones reported having none of the listed features installed, particularly in Zone 5 (39%), followed by Zones 6 and 7 (33% each) and Zone 4 (26%). Ceiling fans only were most commonly reported in Zone 5 (12%), while solar hot water systems and solar panels were reported by relatively small proportions of households across all climate zones.

	Zone 4 *hot dry summer, cool winter*	***Zone 5*** *warm temperate*	***Zone 6*** *mild temperate*	***Zone 7*** *cool temperate*
Count	267	732	510	97
Air conditioning only	23%	21%	25%	16%
Ceiling fans only	4%	12%	6%	2%
Fixed + solar	20%	3%	5%	14%
Fixed heating	7%	2%	5%	21%
Fixed systems	13%	17%	19%	2%
None of these options installed	26%	39%	33%	33%
Not sure	2%	3%	4%	2%
Solar hot water system only	2%	2%	2%	6%
Solar panels only	3%	1%	1%	3%

Table 2. Proportion of households within each climate zone reporting each grouped category of installed energy features (n=1608)

Among households that reported “none of these options installed” (n=554), in written comments many raised a desire for the installation of efficient and renewable energy such as solar, as an affordable and desirable option:

“Would love to have access to a solar system. Even if that cost me extra. Like a subsidised one where the tenant can pay a part of the cost of installation. Even a smaller 3-4kw system would make a huge difference.” – Resident 129

“in a perfect world it would be great if we had solar power on our building” – Resident 217

“It would be really good to get solar panelling made available to housing clients” – Resident 623

Further, inclusion of reverse cycle air conditioning was also strongly advocated for when discussing energy in residents' households:

"Reverse cycle air-conditioning, granted where possible, would greatly improved comfort of living and save on energy costs.....surely it's an added value to the property itself I personally would love one..." – Resident 1302

Some residents expressed willingness to arrange payment plans to install air conditioning to enhance their thermal comfort:

"…I would love to have air conditioning, but I can't afford to install it. If there was any way that I could have this done, and then organise a payment plan to pay for the installation, that would be life changing for my family and I." – Resident 431

Overall, this highlights the perceived importance of installed heating, cooling, and renewable energy infrastructure in shaping resident comfort, to reduce both thermal stress and ongoing energy costs.

3.3 Resident behaviour and thermal comfort

3.3.1 Thermal comfort practices and coping strategies

To understand how energy hardship may affect resident comfort and behaviour, respondents were asked to report on their thermal comfort practices, focusing on how climate conditions and housing infrastructure influenced resident behaviour. Residents were presented with a list of strategies used to keep warm or cool (see Appendix A for question details).

Residents most commonly reported using a portable fan (59%), wearing extra layers (51%) and using a portable heater (48%) to enhance their indoor thermal comfort. Whilst over a third reported taking hot or cold showers (36%) or consuming hot drinks (31%) to manage their comfort levels.

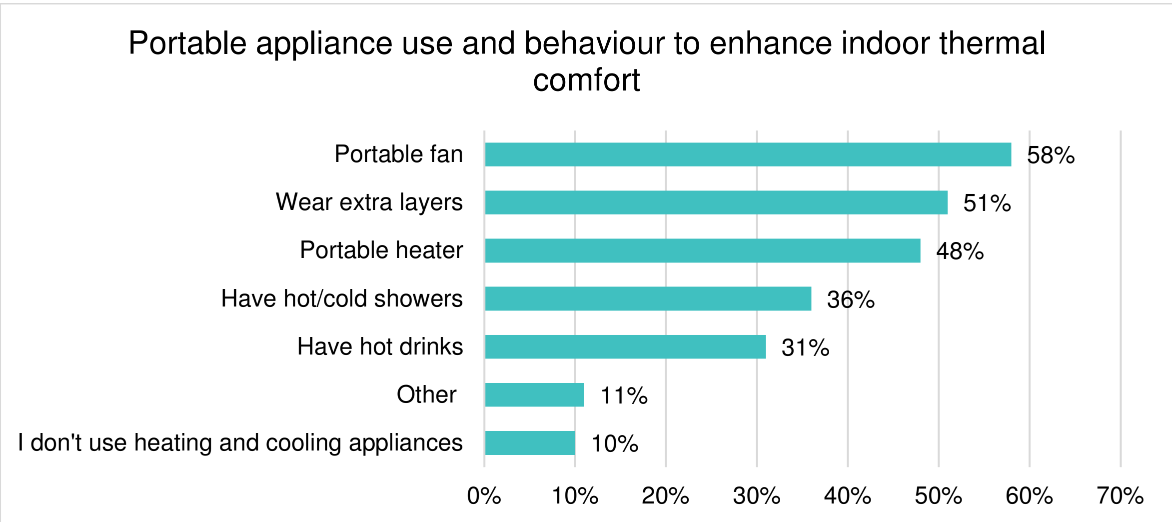

Figure 8. Portable appliance use and behaviours used to enhance thermal comfort (n =1568)

Appliances use and behaviours	*Grouped Categories of Installed Energy Features*								
	Air conditioning only	**Ceiling fans only**	**Fixed + solar**	**Fixed heating**	**Fixed systems**	**None of these options installed**	**Not sure**	**Solar hot water system only**	**Solar panels only**
Count	339	128	111	80	246	550	48	33	25
Portable fan	49%	43%	54%	71%	52%	71%	52%	48%	56%
Portable heater	36%	47%	35%	54%	37%	65%	40%	52%	48%
I don't use heating and cooling appliances	7%	16%	8%	8%	7%	11%	13%	6%	12%
Wear extra layers	52%	45%	63%	43%	54%	50%	33%	48%	56%
Have hot drinks	33%	23%	42%	25%	30%	32%	25%	24%	20%
Have hot/cold showers	38%	28%	49%	35%	34%	36%	38%	33%	16%
Other	14%	5%	11%	8%	14%	8%	10%	18%	12%

Table 3 compares reported use of portable appliances and behavioural responses by the grouped type of heating and cooling fixtures residents reported as installed in their home, noting Respondents could select multiple appliance use and behavioural strategies; therefore, percentages do not sum to 100 percent.

Appliances use and behaviours	*Grouped Categories of Installed Energy Features*								
	Air conditioning only	**Ceiling fans only**	**Fixed + solar**	**Fixed heating**	**Fixed systems**	**None of these options installed**	**Not sure**	**Solar hot water system only**	**Solar panels only**
Count	339	128	111	80	246	550	48	33	25
Portable fan	49%	43%	54%	71%	52%	71%	52%	48%	56%
Portable heater	36%	47%	35%	54%	37%	65%	40%	52%	48%
I don't use heating and cooling appliances	7%	16%	8%	8%	7%	11%	13%	6%	12%
Wear extra layers	52%	45%	63%	43%	54%	50%	33%	48%	56%
Have hot drinks	33%	23%	42%	25%	30%	32%	25%	24%	20%
Have hot/cold showers	38%	28%	49%	35%	34%	36%	38%	33%	16%
Other	14%	5%	11%	8%	14%	8%	10%	18%	12%

Table 3. Use of heating, cooling and thermal comfort strategies among households with different installed energy features (% of households within each installed feature category; n = 1560)

Households which reported "none of these options installed" were more likely to rely on portable heating and cooling appliances than households with other installed features. Among residents who reported "none of these options installed", 71 percent used a portable fan, and 64 percent used a portable heater, compared with 51 percent and 35 percent respectively among households with air conditioning installed. Behavioural adaptations were common across all housing types, with around half of respondents reporting strategies such as wearing extra layers, while around one-third reported using hot drinks or hot and cold showers to manage indoor temperatures.

This pattern was also reflected in residents' written comments, with many households that reported none of the listed features installed describing reliance on portable heaters, fans and other adaptive strategies to manage indoor temperatures. Several residents specifically noted the need to use portable appliances in the absence of fixed heating and cooling infrastructure:

> *"There is no cooling in my home at all, if we want it cool, we have to use portable fans and portable air conditioners" – Resident 116*
>
> *"I cannot afford air conditioning in my home and in hotter months it is unbearable for me and my 2 children. We have fans and take cold showers…" – Resident 880*

Others shared techniques they had also used to keep either warm or cold:

> *"We have to sit with a wet face washer on our heads in summer time to try stay cool enough, the heat can be unbearable & very hard to sleep in" – Resident 1206*
>
> *"I have put blackout stickers on the west side facing windows and have the blinds and doors closed to keep the heat out" – Resident 14*
>
> *"I try to minimise electricity usage by putting more clothes on in the winter and by using the blinds to shut out the sun during summer." – Resident 1132*

Ultimately, this demonstrates that for some households, portable appliances and behavioural adaptations played an important role in managing indoor thermal comfort, particularly where residents perceived existing heating or cooling infrastructure to be inadequate or unavailable.

Comparison of appliance use and behavioural strategies by climate zone showed largely consistent patterns across zones. Portable fans were the most commonly used appliance in all climate zones, reported by between 55 and 63 percent of households, while portable heaters were used by around half of households across each zone. Wearing extra layers was also common, particularly in Zones 5 and 6 (both 52%), whilst between 7 and 12 percent of households reported not using heating or cooling appliances. Behavioural strategies such as having hot drinks and taking hot or cold showers were widely used across all climate zones.

Appliances use and behaviours	Climate zone			
	Zone 4 hot dry summer, cool winter	Zone 5 warm temperate	Zone 6 mild temperate	Zone 7 cool temperate
Count	258	718	497	94
Portable fan	63%	57%	59%	55%
Portable heater	50%	48%	49%	45%
Don't use heating/ cooling appliances	7%	12%	7%	11%
Wear extra layers	45%	52%	52%	48%
Have hot drinks	28%	30%	35%	29%
Have hot/cold showers	43%	32%	37%	40%
Other	12%	10%	10%	11%

Table 4. Portable appliance use and behavioural strategies for thermal comfort by climate zone ((% of households within each climate zone; n=1492)

As reflected in written sentiments, adaptive behaviour and portable appliance use was common in both summer and winter months, especially in the absence of fixed infrastructure:

> *"…throughout winter I usually have thick clothing on and often sit under a blanket...in the hotter months I use [a] pedestal fan [but] it's mainly to circulate the air... [In] winter months when I'm feeling the cold really badly…I turn the heater on for a couple hours a day, I try to avoid using it because it alone triples my energy usage so [I] often freeze, making myself crook due to the power usage and the cost off it ... life is too expensive…specifically when you live on the poverty line" – Resident 260*

As shown in Appendix B, participants were asked to report their weekly household income. This data was subsequently cross tabulated with other survey responses. In considering this data, findings should be interpreted with caution, as some residents receiving government support payments may not have considered these payments to constitute income and may therefore have selected the "no income" category (12%).

Comparison of appliance use and behavioural strategies by weekly income shows use of portable fans and heaters increased with income, rising from 50 percent to 73 percent for fans and 41 percent to 80 percent for heaters across income groups. In contrast, residents on lower incomes were more likely to report not using heating or cooling appliances. Behavioural strategies such as wearing extra layers and having hot drinks were common across all incomes groups.

Appliance use and behaviours	Weekly income						
	No income	$1-$299 ($7,800-$15,599)	$300-$499 ($15,600-$25,999)	$500-$799 ($26,000-$41,599)	$800-$1,249 ($41,600-$64,999)	$1,250-$1,749 ($65,500-$90,999)	$1,750 - $2,499 ($91,000-$129,999)
Count	192	224	454	412	194	44	15
Portable fan	50%	59%	56%	60%	65%	70%	73%
Portable heater	41%	46%	50%	49%	51%	57%	80%
I don't use heating and cooling appliances	14%	12%	10%	8%	8%	2%	7%
Wear extra layers	38%	47%	53%	55%	52%	48%	73%
Have hot drinks	20%	31%	30%	33%	36%	36%	67%
Have hot/cold showers	30%	35%	34%	36%	42%	39%	40%
Other	11%	12%	11%	9%	12%	7%	7%

Table 5. Portable appliance use and behaviours for thermal comfort compared by weekly income (% of households within each installed feature category, n=1535)

However, in written commentary, some residents raised the difficulty of affording to use these appliances in the absence of installed fixtures:

> *"The only heating I have is an old, recycled air conditioner, which due to the extreme cold temperatures recently is needed to be used …Thus, energy bills have increased considerably. And on a pension, [it] is hard to sustain." – Resident 582*

> *"Having a single but affective form of cooling would be cheaper and safer than the 2 neck fans that I have to charge and swap every 15 minutes and the 5 pedestal fans scattered across my unit come summer." – Resident 795*

Overall, these results show that the use of portable appliances and behavioural adaptations frequently acted as substitutes for heating and cooling infrastructure, however this appliance use could also increase ongoing household energy costs.

3.3.2 Thermal conditions and health outcomes

In exploring the perceived impacts of thermal comfort on health, residents were asked to express how often they felt the temperature of their home had worsened their health, or the health of other household occupants. As visualised in Figure 9, a majority (54%) indicated that this affected themselves or other household occupants at least sometimes, whilst 36 percent never or rarely experienced this.

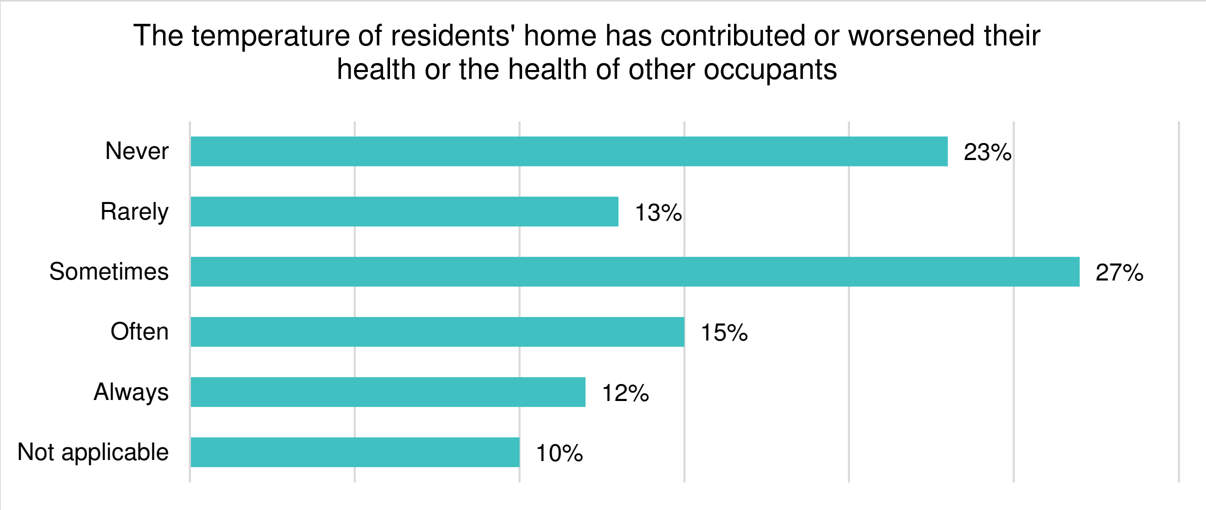

Figure 9. Reported health impacts on respondents and household occupants associated with indoor temperature (n=1437)

A comparison of reported health impacts (Figure 9) by grouped categories of energy-related infrastructure (see Figure 7), showed that residents with "none of these options installed" were more likely to report persistent temperature-related health impacts. Nearly one in five households (18%) in this group reported that the temperature of their home always contributed to or worsened their health or the health of other occupants. In contrast, households with ceiling fans only and fixed plus solar systems were the most likely to report that indoor temperatures had never contributed to health impacts (32% and 31%, respectively), compared with 19% of households with none of the listed options installed.

Sentiment	***Grouped Categories of Installed Energy Features***								
	Air conditioning only	**Ceiling fans only**	**Fixed + solar**	**Fixed heating**	**Fixed systems**	**None of these options installed**	**Not sure**	**Solar hot water system only**	**Solar panels only**
Count	319	111	104	72	232	497	39	33	24
Never	23%	32%	31%	21%	25%	23%	19%	21%	21%
Rarely	12%	13%	11%	13%	15%	15%	11%	9%	25%
Sometimes	29%	28%	23%	31%	32%	26%	23%	30%	25%
Often	14%	12%	18%	15%	10%	18%	17%	15%	17%
Always	13%	7%	9%	11%	5%	8%	18%	12%	8%
Not applicable	8%	9%	8%	10%	12%	10%	11%	12%	4%

Table 6. Frequency of reported health impacts associated with indoor temperatures by grouped categories of installed energy features (n=1431)

These experiences were also reflected in written feedback:

"I live on a top floor and in summer [it] is unbearable. Even the indoor walls are warm. Old vertical blinds are brittle and dropping regularly and not providing sunshade. This place is extremely hot in summer and it's affecting me mentally and physically due to high BP and sleep apnea [sic] at night." – Resident 474

This suggests that while health impacts were reported across many households, the presence of installed systems may mitigate these impacts to some extent, a sentiment echoed in written feedback:

"I would like to have options and support to install air conditioning, we feel incredibly hot in summer months, we can't sleep, this affects me going to work and functioning and is difficult to get my kids to go to school. I would love to have air conditioning, but I can't afford to install it… [air conditioning] would be life changing for my family and I." – Resident 431

"I would prefer to have the gas heater removed as there is no power point near it to use it & gas triggers my asthma & migraines. I would prefer to get a reverse cycle air conditioner to run heat & cooling" - Resident 46

3.3.3 Housing infrastructure and temperature and safety

Residents were also asked to report on their perception of safety in relation to temperature, specifically *'In the past year, approximately how often was your home at a temperature that you felt was unsafe or unhealthy?'* (see Appendix A).

As visualised in Figure 10, residents showed mixed responses, with 39 percent indicating that their home never felt unsafe or unhealthy temperature, whilst 24 percent felt that their home was at an unsafe or unhealthy temperature for some months (i.e. 2 months or more) over the last year. This may reflect longstanding differences in dwelling age, design, and ownership arrangements, rather than discretionary decisions by community housing providers.

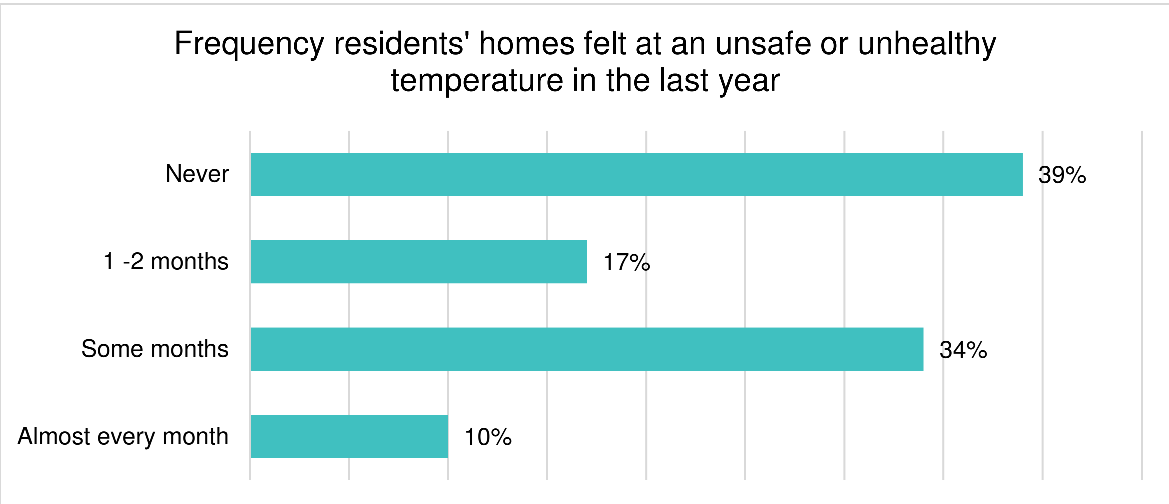

Figure 10. Frequency residents felt their home was at an unsafe temperature in last 12 months (n=1600)

Analysis by climate zone revealed no major variance in the frequency resident's homes felt at an unsafe temperature, however, residents in Zone 4 and Zone 6 had slightly higher proportions of residents who felt unsafe almost every month (11%).

Climate zone		***Frequency residents felt their home was at an unsafe or unhealthy temperature***			
	Count	**Never**	**1 -2 months**	**Some months**	**Almost every month**
Zone 4 *hot dry summer, cool winter*	266	39%	19%	30%	11%
Zone 5 *warm temperate*	728	38%	18%	35%	9%
Zone 6 *mild temperate*	509	38%	16%	35%	11%
Zone 7 *cool temperate*	95	47%	16%	29%	7%

Table 7. Frequency home felt at an unsafe or unhealthy temperature in the past 12 months by climate zone (n=1599)

Comparison of perceived indoor thermal health/safety by grouped heating and cooling features demonstrates that households with both fixed systems and solar were the most likely to report that their home was never at an unsafe or unhealthy temperature (51%). In contrast, households with none of the survey options installed were the least likely to report this, with one-third (33%) indicating their home was never at an unsafe or unhealthy temperature (see Table 8).

Grouped categories of installed energy features		***Frequency residents felt their home was at an unsafe/unhealthy temperature***			
	Count	**Never**	**1 -2 months**	**Some months**	**Almost every month**
Air conditioning only	357	38%	17%	33%	11%
Ceiling fans only	130	48%	15%	31%	5%
Fixed + solar	114	51%	19%	26%	3%
Fixed heating	78	36%	18%	36%	10%
Fixed systems	258	40%	21%	33%	5%
None of these options installed	546	49%	11%	32%	9%
Not sure	47	33%	15%	38%	14%
Solar hot water system only	34	32%	21%	38%	9%
Solar panels only	26	46%	23%	27%	4%

Table 8. Frequency home felt at an unsafe temperature by grouped categories of installed energy features (n=1590)

These findings suggest that access to multiple energy systems is associated with better indoor thermal safety, compared with limited or no installed infrastructure. This was also raised in the context of age or chronic illness:

> *"This new apartment building has no air-conditioning. Indoor temperatures in winter and especially summer render it almost impossible to survive mainly when outside temperature reaches 26 degree[s] and over outside. On many occasions in summer we have to vacate the apartment mostly after about 1pm to 7pm. My [elderly] wife and I both suffer from serious health conditions and our health conditions are exacerbated by the extreme temperature in the apartment in both summer and winter. … there are many aged residents residing in this building and all have the same major problem coping both in winter and summer. We are all at risk of heat stroke and some are house bound due to health issues…" - Resident 1115*

3.3.4 Who experiences unsafe or unhealthy temperatures?

When compared by age, residents aged 26 to 55 more commonly reported that their home was at an unsafe temperature for one or more months, whilst residents aged 66 and over were more likely to report that this never occurred, increasing to 45 to 47 percent amongst this cohort.

Age		*Frequency residents felt their home was at an unsafe/unhealthy temperature*			
	Count	**Never**	**Some months**	**1 -2 months**	**Almost every month**
18 - 25	76	43%	24%	26%	7%
26 - 35	117	38%	31%	16%	15%
36 - 45	206	33%	36%	19%	12%
46 - 55	313	32%	37%	18%	13%
56 - 65	424	39%	33%	17%	10%
66 - 75	300	45%	33%	17%	5%
76 and over	150	47%	38%	11%	4%

Table 9. Frequency participants' home felt at an unsafe or unhealthy temperature in the last 12 months by age (n=1586)

There was no clear relationship between time spent at home and the frequency with which residents reported unsafe or unhealthy indoor temperatures. While residents spending more than 20 hours at home were somewhat more likely to report recurrent exposure, differences between groups were generally modest.

Hours spent at home	*Frequency residents felt their home was at an unsafe/unhealthy temperature*				
	Count	**Never**	**1 -2 months**	**Some months**	**Almost every month**
During the week					
less than 4 hrs	23	64%	9%	9%	18%
4 - 8 hrs	149	43%	18%	30%	9%
8 - 12 hrs	188	39%	15%	36%	10%
12 - 16 hrs	252	41%	22%	30%	7%
16 - 20 hrs	303	38%	19%	38%	5%
more than 20 hrs	663	36%	16%	35%	13%
Weekend					
less than 4 hrs	31	58%	10%	19%	13%
4 - 8 hrs	97	42%	19%	30%	9%
8 - 12 hrs	181	41%	18%	32%	9%
12 - 16 hrs	212	42%	18%	33%	6%
16 - 20 hrs	364	39%	18%	38%	6%
more than 20 hrs	699	36%	17%	34%	13%

Table 10. Frequency participants' home felt at an unsafe or unhealthy temperature by hours spent at home on weekdays and weekends (n=1587)

Comparison of perceived indoor temperature conditions by cultural background showed some variation between groups. Aboriginal and/or Torres Strait Islander residents were less likely to report that their home was never at an unsafe or unhealthy temperature (32%) than residents born in Australia who were not Aboriginal and/or Torres Strait Islander (41%) and migrant residents (38%). They were also more likely to report experiencing unsafe or unhealthy temperatures almost every month (12%, compared with 9% among both Australian-born and migrant residents). Across all cultural groups, around one-third to two-fifths of residents reported that their home was never at an unsafe or unhealthy temperature, while a further one-third reported experiencing these conditions for one to two months of the year.

Cultural background	Frequency residents felt their home was at an unsafe/unhealthy temperature				
	Count	Never	Some months	1 -2 months	Almost every month
Aboriginal and/or Torres Strait Islander	306	32%	18%	37%	12%
Born in Australia (not Aboriginal and/or Torres Strait Islander)	808	41%	18%	31%	9%
Migrant (not born in Australia)	323	38%	14%	39%	9%
None of the above	177	37%	19%	33%	12%

Table 11. Frequency participants' home felt at an unsafe or unhealthy temperature by cultural background (n=1589)

3.3.5 Building fabric performance and housing quality

In addition to thermal comfort, residents also raised issues relating to the infrastructure of their home, including insulation, ventilation and orientation, as core aspects that influenced indoor temperatures, impacting their health and wellbeing. Many reported mould or damp issues caused by dark rooms or poor insulation and ventilation:

> *"My house is an old housing commission home. It has no insulation to protect me from cold nor hot weather. A lot of wet weather causes me to suffer a lot of mould inside. Some areas worse than others." – Resident 378*

> *"My house is cold in winter has mold [sic] in my daughter [sic] room around her window which makes her sick sometimes" – Resident 660*

Residents also described adapting their behaviours in response to inadequate insulation, noting associated impacts on health, wellbeing and energy costs, as illustrated by Resident 1228:

> *"Our home does not have any insulation and it was built only 18 years ago. Winters are very cold in here and the summers [are] unbearable upstairs. [In summer] I slept downstairs a lot but I have a back problem which made it worse. I didn't sleep well throughout summer at all. There are no ceiling fans either. It definitely affected both my sons and I [sic] health. We use the electrical appliances we have for heating and cooling sparingly as it costs too much and yet we still obtain a bill sizeable for the two of us. We cannot reduce consumption anymore other we will be freezing in winter and sweltering in summer." – Resident 1228*

Overall, this indicates housing conditions and infrastructure are not only important factors in enhancing community housing residents' thermal comfort, but as a key aspect shaping residents' physical and mental wellbeing.

3.4 Energy use, behaviour and affordability

To understand how energy costs were impacting resident behaviour, residents were asked to respond to questions regarding actions taken in response to rising energy prices. As visualised in Figure 11, rising energy prices led many households to change their daily habits, with most participants (61%) reducing how much they heat or cool their homes, as well as cutting back on essential spending (41%). Many also limited appliance use (35%), took fewer hot showers (35%), or adjusted cooking routines (26%).

As one resident explained:

> *"I don't use heating or cooling items at home, short showers & minimal gas as I don't use much, turn off lights etc when not needed" – Resident 1244*

Almost a fifth (19%) of respondents indicated they left their homes to seek more comfortable environments, whilst a small number switched energy provider. Seven percent of respondents indicated rising costs had resulted in missed rent payments.

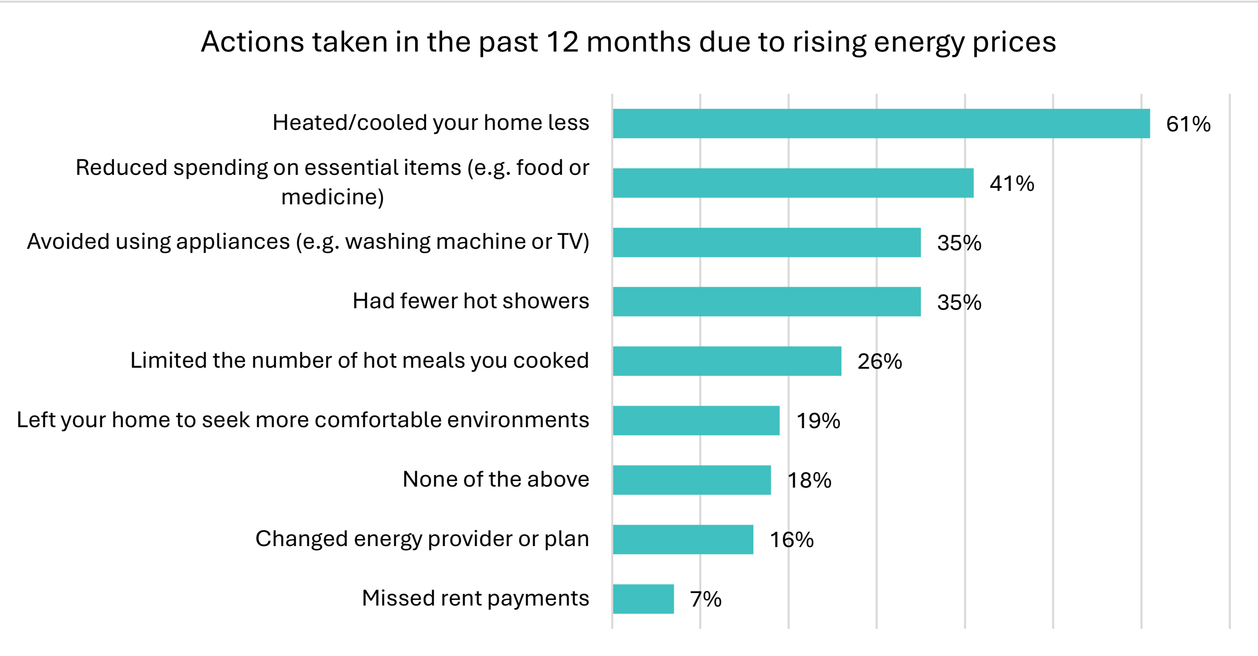

Figure 11. Actions taken by participants in the last 12 months due to rising energy prices (n=1603)

3.4.1 Infrastructure access and coping behaviour

To examine how installed energy features influenced residents' energy use and behaviours, Table 12 compares reported coping actions by the presence of household heating and cooling features.

Behaviour modifications were common across all household groups. The most frequently reported response was heating or cooling the home less often, reported by between 39% and

69% of households depending on infrastructure type. This was particularly common among households with fixed systems (69%), fixed and solar systems (68%), and air conditioning only (64%). Even among households reporting no listed features installed, almost three in five (58%) reported reducing their heating or cooling use.

Reducing spending on essential items was also common across most groups, affecting between 31% and 54% of households. Avoiding appliance use was another frequently reported strategy, ranging from 29% to 47% across infrastructure categories. The highest rates were reported among households who were unsure which features were installed (47%) and those with fixed heating only (45%), although these findings should be interpreted with caution given the relatively small number of respondents in some categories.

While heating or cooling the home less frequently was the most common coping behaviour overall, some differences were evident between groups. Households with no listed features installed were more likely to report leaving the home to seek a more comfortable environment (25%), compared with households with fixed systems (14%), fixed and solar systems (14%), or air conditioning only (15%). They were also more likely to report avoiding appliance use (38%) and reducing spending on essential items (42%), suggesting greater reliance on behavioural and financial adaptations to manage energy costs.

Overall, the findings indicate that residents across all housing types were making adjustments in response to rising energy prices. However, households with limited access to installed heating and cooling infrastructure appeared more likely to rely on disruption to everyday activities, including leaving the home to seek comfort and restricting household energy use.

Actions taken in last 12 months	*Grouped categories of installed energy features*								
	Aircon only	**Ceiling fans only**	**Fixed + solar**	**Fixed heating only**	**Fixed systems**	**None of these options installed**	**Not sure**	**Solar hot water system only**	**Solar panels only**
Count	356	129	114	78	259	549	49	34	26
Heated/cooled home less	64%	53%	68%	64%	69%	58%	39%	59%	65%
Left home to seek more comfortable environments	15%	19%	14%	18%	14%	25%	22%	18%	15%
Had fewer hot showers	35%	27%	29%	38%	35%	36%	35%	44%	35%
Limited the number of hot meals you	26%	22%	30%	28%	24%	27%	33%	24%	35%
Avoided using appliances	33%	29%	32%	45%	29%	38%	47%	32%	46%
Reduced spending on essential items	42%	36%	40%	42%	41%	42%	31%	53%	54%
Missed rent payments	7%	2%	7%	3%	5%	9%	4%	9%	4%
Changed energy provider or plan	18%	18%	20%	18%	16%	14%	8%	9%	15%
None of the above	16%	22%	22%	9%	17%	19%	29%	12%	12%

Table 12. Actions taken to in the last 12 months due to energy prices compared by grouped categories of installed energy features % of households within each installed feature category; n =1603)

In written feedback, some residents outlined behaviour modifications undertaken to improve their thermal comfort if their home was at an uncomfortable temperature. A subset of these residents referenced more extreme behavioural modifications in order to increase their comfort levels:

> *"If the weather gets too cold we close half the house and sleep in tents in the loungeroom." – Resident 462*

> *"IT IS UNBAREABLY (sic) HOT upstairs for the period Nov to March. Often, we sleep downstairs on the floor. Fans just don't cut it." – Resident 214*

3.4.2 Income differences in energy hardship behaviours

Comparisons by income group reveal that reducing heating or cooling use was common across all income groups. As shown in Table 13, the sample was predominantly comprised of households earning less than $800 per week (see also Appendix B). Findings for higher income categories, particularly households earning $1,250–$1,749 per week (n=48) and $1,750–$2,499 per week (n=15), should be considered with caution due to small sample sizes.

Reducing heating or cooling use was common across all income groups, reported by between 54 and 65 percent of households regardless of income. Reducing spending on essential items was also prevalent, affecting between 39 and 47 percent of households across most income groups.

Some energy-related coping behaviours were more common among lower income households. Avoiding the use of appliances was reported by 43 percent of households earning $1-$299 per week and 36-43 percent of households earning less than $800 per week, compared with 19 percent of households earning $1,250-$1,749 per week. Similarly, limiting the number of hot meals cooked affected around 27-29 percent of households earning less than $500 per week, compared with 10 percent of households earning $1,250-$1,749 per week.

Missing rent payments were relatively uncommon overall but varied across income groups. Rates were lowest among households reporting no income (3%) and those earning $300–$499 per week (5%), increasing to 12–13 percent among households earning $800–$1,749 per week and 20 percent among households earning $1,750–$2,499 per week. The relatively low rates among households with no income may partly reflect the use of automatic payment arrangements, such as Centrepay, among some recipients of income support payments. However, the survey did not collect information on rent payment methods, therefore this interpretation should be considered with caution.

Actions taken in last 12 months due to	Weekly income						
	No income	$1-$299	$300-$499	$500-$799	$800-$1,249	$1,250-$1,749	$1,750 - $2,499
Count	194	228	462	419	202	48	15
Heated/cooled your home less	54%	59%	62%	65%	63%	56%	60%
Left your home to seek more comfortable environments	20%	26%	18%	20%	15%	10%	27%
Had fewer hot showers	34%	37%	39%	32%	33%	23%	27%
Limited the number of hot meals you cooked	27%	29%	29%	23%	24%	10%	20%
Avoided using appliances	34%	43%	36%	35%	30%	19%	33%
Reduced spending on essential items	39%	43%	40%	45%	42%	29%	47%
Missed rent payments	3%	9%	5%	6%	12%	13%	20%
Changed energy provider or plan	13%	14%	16%	16%	18%	21%	20%
None of the above	20%	15%	17%	17%	21%	27%	20%

Table 13. Actions taken in response to rising energy prices by weekly household income (% of households within each income group) (n = 1568)

In response to energy costs, some residents reported altering daily practices to minimise electricity use, including avoiding standard appliances and relying on alternative cooking or water-use arrangements:

> *"… [I] Shower down [at the] beach in summer to save hot water. Have never used stove, too expensive. Have small induction plate plus microwave. Boil kettle in morning fill thermos [with it] use it all day to save electric – Resident 738*

> *"I am very frugal and use a small camp stove to save electricity." – Resident 799*

3.4.3 Affordability-related thermal discomfort

Respondents were asked to rate their thermal comfort in summer compared to winter. The results indicate that most residents discomfort at least sometimes in summer and winter at least some of the time due to affordability (73% and 72% respectively). Notably, discomfort was experienced more frequently in summer (25% often and 15% always) compared to winter (21% often and 11% always). This could worsen with climate change, which is expected to increase the number of extreme heat days (CSIRO & Bureau of Meteorology, 2022).

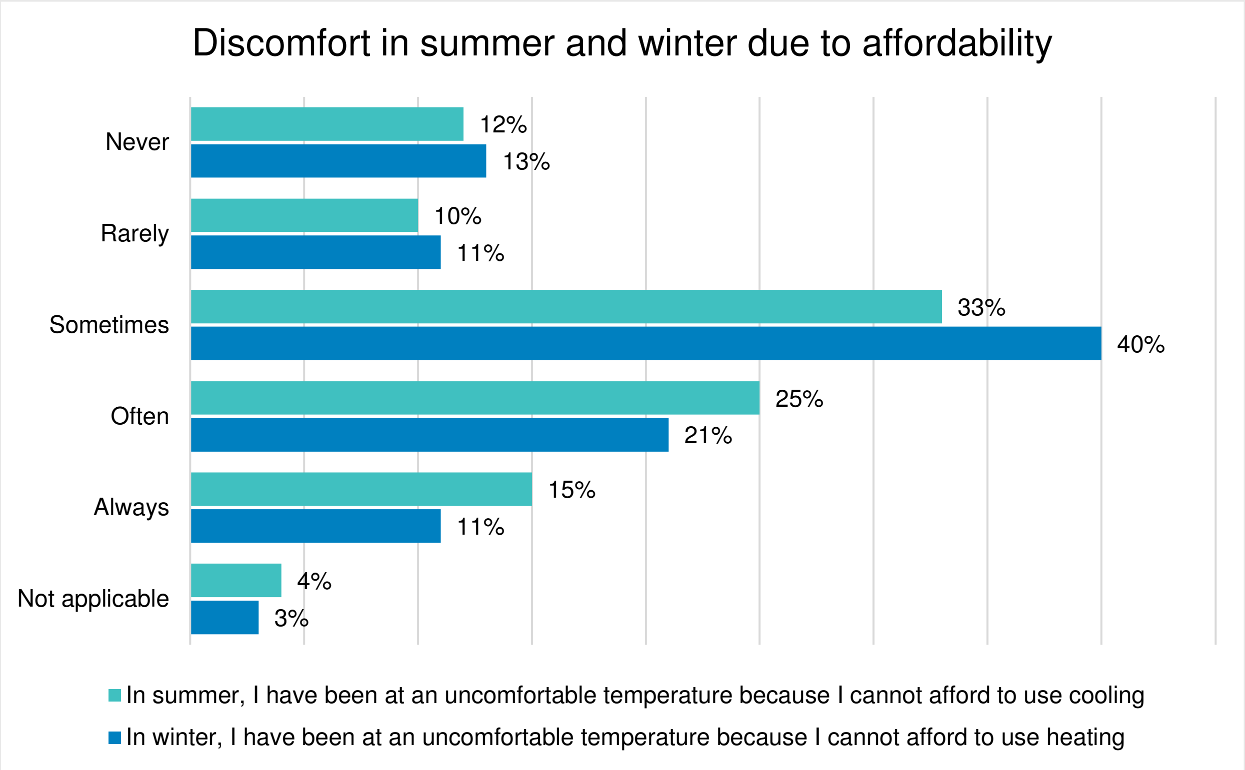

Figure 12. Frequency of thermal discomfort in summer and winter (n=1494)

Comparison by climate zone indicated no substantial differences in reported thermal discomfort linked to energy affordability, with broadly similar levels of discomfort reported across all zones in both winter and summer (see Table 14).

Sentiment	Climate zone			
	Zone 4 hot dry summer, cool winter	Zone 5 warm temperate	Zone 6 mild temperate	Zone 7 cool temperate
Count	247	667	485	93
Discomfort in summer				
Never	12%	11%	13%	10%
Rarely	11%	10%	10%	12%
Sometimes	35%	34%	29%	32%
Often	21%	24%	26%	24%
Always	16%	13%	16%	12%
Not applicable	3%	6%	3%	9%
Discomfort in winter				
Never	11%	13%	13%	9%
Rarely	13%	11%	10%	12%
Sometimes	44%	37%	40%	39%
Often	17%	21%	23%	24%
Always	13%	11%	11%	10%
Not applicable	2%	4%	2%	4%

Table 14. Thermal discomfort in summer and winter cross-tabulated by climate zone (% of households within each climate zone; n=1494)

Comparison of affordability-related thermal discomfort by installed energy features showed that discomfort was experienced across all housing types. In summer, around one-third of households reported being uncomfortable sometimes, including those with ceiling fans only (37%), air conditioning only (36%), fixed and solar systems (33%), and solar panels only (31%). More frequent discomfort (often or always) was reported by almost half of households with no installed features (48%), with similarly high levels reported among households with solar panels only (54%) and fixed heating only (46%). Findings for categories with smaller sample sizes, including solar panels only and solar hot water only, should be interpreted with caution.

Winter discomfort was also common across all feature types, with around one-third to one-half of households reporting being uncomfortable sometimes. Households with no installed features were among the most likely to report being uncomfortable often or always (40%), compared with households reporting fixed and solar systems (22%) and fixed systems (20%). Overall, while households with some installed energy features generally reported lower levels of severe discomfort, affordability-related thermal discomfort remained common across all groups.

Sentiment	Grouped categories of installed energy features								
	Aircon only	Ceiling fans only	Fixed + solar	Fixed heating	Fixed systems	None of these options installed	Not sure	Solar hot water system	Solar panels only
Count	333	117	105	74	237	520	41	34	26
Discomfort in summer									
Never	13%	15%	19%	8%	14%	8%	10%	15%	4%
Rarely	13%	7%	16%	14%	10%	21%	8%	0%	12%
Sometimes	36%	37%	33%	25%	42%	33%	28%	36%	31%
Often	25%	21%	22%	31%	21%	23%	26%	15%	35%
Always	9%	15%	8%	15%	9%	13%	22%	27%	19%
Not applicable	4%	6%	2%	6%	4%	3%	5%	6%	0%
Discomfort in winter									
Never	14%	19%	18%	9%	14%	8%	11%	18%	4%
Rarely	14%	6%	13%	17%	14%	15%	8%	9%	8%
Sometimes	41%	38%	44%	30%	50%	38%	37%	26%	35%
Often	21%	26%	14%	23%	14%	13%	24%	32%	38%
Always	8%	8%	8%	17%	6%	21%	16%	9%	15%
Not applicable	3%	4%	3%	4%	3%	5%	4%	6%	0%

Table 15. Discomfort experienced in summer and winter due to affordability analysed by grouped categories of installed features (n=1487)

3.5 Managing energy payments

The survey also explored how households manage their energy bills. Respondents were asked to indicate how often they had struggled with energy bills in the past year. As visualised in Figure 13, most residents had struggled in some way, with the largest category of respondents (32%) experiencing this sometimes, with 35 percent either often (16%) or always (19%) struggling with bill payment.

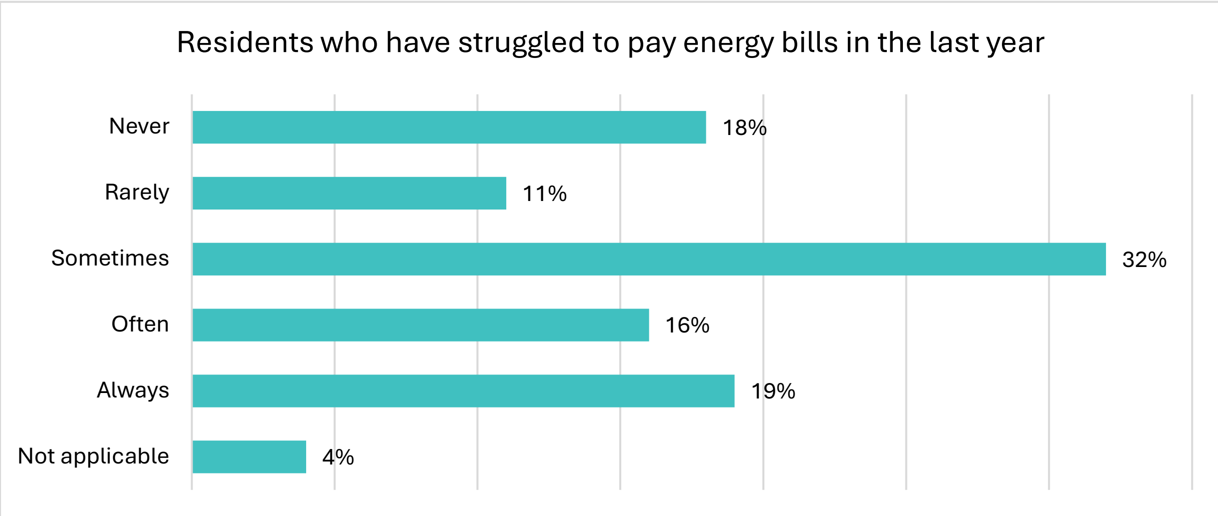

Figure 13. Residents reporting whether they struggled to pay their energy bills in the last 12 months (n=1476)

In expanding on this, residents also raised financial stress in written feedback:

> *"In recent months due to the abrupt increase of energy costs I have struggled to maintain financial positioning on bills with all credits being absorbed by price increase and arrears are appearing inevitable" – Resident 68*

> *"It's difficult every day to live and pay bills and my medical + medications" – Resident 270*

3.5.1 Who experiences higher levels of bill stress?

To explore factors associated with financial stress related to energy bills, Table 16 compares household experiences of financial hardship by cultural background, weekly income, household size, and property type.

Analysis by cultural background indicates Aboriginal and/or Torres Strait Islander residents reported the highest levels of persistent bill stress, with half (50%) indicating they often (23%) or always (27%) struggled to pay energy bills in the past 12 months. Financial hardship was also more common among lower-income households. Residents with weekly household incomes of $1–$299 reported the highest levels of persistent financial difficulty, with 46 percent indicating they often or always struggled to pay energy bills. By comparison, around one-third of households earning between $300 and $1,249 per week reported often or always struggling.

Experiences of bill stress was more commonly associated with larger households. While 28 percent of single-person households reported often or always struggling to pay energy bills, this increased to 51 percent among three-person households, 60 percent among four-person households, and 64 percent among households with six or more occupants, however smaller sample sizes may have also impacted these results so must also be considered when interpreting this data.

In addition, differences were also evident by property type. Residents living in detached houses reported the highest levels of persistent bill stress, with 43 percent indicating they often or always struggled to pay energy bills, compared with 38 percent of villa/townhouse residents and 30 percent of unit or apartment residents. Residents living in units or apartments were also the most likely to report they never or rarely experienced difficulty paying energy bills (32%).

Variable		*Frequency of difficulty paying energy bills in the last 12 months*					
	Count	**Never**	**Rarely**	**Sometimes**	**Often**	**Always**	**N/A**
Cultural background							
Aboriginal and/or Torres Strait Islander	288	10%	7%	29%	23%	27%	4%
Born in Australia (not Aboriginal and/or Torres Strait Islander)	741	20%	11%	35%	14%	17%	3%
Migrant (not born in Australia)	296	21%	13%	29%	14%	17%	6%
None of the above	164	12%	9%	32%	22%	21%	4%
Weekly household income							
No income	163	18%	7%	36%	15%	18%	5%
$1-$299 ($7,800-$15,599)	207	16%	10%	24%	17%	29%	3%
$300-$499 ($15,600-$25,999)	433	18%	12%	34%	15%	18%	4%
$500-$799 ($26,000-$41,599)	395	17%	12%	31%	19%	18%	3%
$800-$1,249 ($41,600-$64,999)	185	19%	11%	32%	16%	17%	4%
$1,250-$1,749 ($65,500-$90,999)	46	20%	11%	39%	17%	11%	2%
$1,750 -$2,499 ($91,000-$129,999)	15	7%	7%	47%	13%	27%	-
Total occupants							
1 person	822	23%	14%	32%	14%	14%	4%
2 persons	343	15%	6%	38%	18%	20%	3%
3 persons	154	7%	10%	29%	22%	29%	3%
4 persons	70	4%	3%	30%	21%	39%	3%
5 persons	58	7%	5%	28%	26%	33%	2%
6 or more	25	8%	4%	16%	20%	44%	8%
Property type							
Detached house	463	13%	10%	32%	18%	25%	2%
Semi-detached	50	12%	14%	22%	30%	18%	4%
Villa/Townhouse	174	20%	7%	31%	17%	21%	4%
Unit/apartment	778	20%	12%	34%	14%	16%	5%

Table 16. Residents who have struggled to pay energy bills in last year by selected household characteristics (n=1476)

3.5.2 Housing factors associated with bill stress

Analysis of installed heating, cooling and solar features suggests that bill stress is experienced across all housing types, however, was generally higher among households without fixed energy infrastructure. As visualised in Table 17, households that reported "none of these options installed" experienced some of the highest levels of financial stress, with around four in ten reporting they struggled often or always to pay their energy bills, including around one quarter who always struggled. In contrast, households with fixed systems reported comparatively lower levels of persistent financial hardship, with higher proportions indicating they had never or rarely struggled.

Residents in homes with solar panels only or air conditioning only also reported financial stress, with around half (solar panels only) and 4 in 10 (air conditioning only) experiencing difficulty often or always. Households with solar panels represented the smallest group in the sample (n=25), therefore, these results should be interpreted with caution.

Overall, this indicates that while access to installed energy features is associated with somewhat lower financial stress, energy affordability challenges remain widespread, and the absence of infrastructure is linked to persistent financial stress amongst residents.

Grouped categories of installed energy features	*Residents who have struggled to pay their energy bills in the last year*						
	Count	**Never**	**Rarely**	**Sometimes**	**Often**	**Always**	**N/A**
Air conditioning only	331	15%	8%	33%	18%	22%	4%
Ceiling fans only	117	26%	16%	29%	20%	6%	3%
Fixed + solar	109	18%	11%	35%	13%	19%	5%
Fixed heating	71	11%	13%	38%	23%	15%	0%
Fixed systems	234	19%	16%	35%	11%	15%	4%
None of these options installed	512	18%	10%	28%	21%	18%	5%
Not sure	39	17%	9%	30%	16%	24%	4%
Solar hot water system only	32	19%	16%	34%	19%	9%	3%
Solar panels only	25	16%	4%	24%	24%	28%	4%

Table 17. Residents who have struggled to pay energy bills in the last year by grouped categories of installed energy features (n=1470)

Portable appliance use and adaptive behaviours were associated with difficulty paying energy bills. As shown in Table 18, residents who reported higher levels of bill stress were more likely to rely on portable heaters and low-cost behavioural strategies to manage indoor temperatures.

Portable heater use increased from 46 per cent among those who never struggled to pay their bills to 58 per cent among those who always struggled. Similarly, the use of hot drinks rose from 24 per cent to 41 per cent, while the use of hot or cold showers increased from 26 per cent to 49 per cent. In contrast, residents who did not use heating or cooling appliances were a relatively small proportion of respondents across all groups.

Appliance use and behaviour		*Residents who have struggled to pay their energy bills in the last year*					
	Count	**Never**	**Rarely**	**Sometimes**	**Often**	**Always**	**N/A**
Portable fan	857	16%	11%	33%	17%	20%	4%
Portable heater	714	16%	9%	33%	16%	23%	4%
I don't use heating and cooling appliances	134	25%	11%	22%	10%	24%	7%
Wear extra layers	754	17%	11%	31%	18%	21%	3%
Have hot drinks	462	13%	11%	32%	16%	25%	3%
Have hot/cold showers	532	12%	9%	33%	17%	25%	3%
Other	148	19%	11%	28%	18%	20%	3%

Table 18. Financial stress related to energy billing compared by appliance use and behaviours to enhance thermal comfort (n=1438)

> *"I cannot afford air conditioning in my home and in hotter months it is unbearable for me and my 2 children. We have fans and take cold showers. That relieves the situation whilst we are in the cold shower but once we are out we are hot again and it is water wastage that then goes onto my water bill which I struggle to pay." – Resident 820*

> *"I have to use a portable heater I can't afford to use sometimes" – Resident 1524*

3.5.3 Actions taken to manage energy costs

Many respondents reported taking active steps to manage or defer energy costs. The most common response was applying for energy concessions or rebates, reported by half of all respondents (50%), followed by arranging a payment plan with an energy provider (36%). More financially precarious coping strategies were also common, including delaying or missing bill payments (26%), and borrowing money from family or friends to pay energy bills (21%). A smaller proportion reported using credit cards (12%) or 'buy now pay later' services (6%), while 10 percent relied on material aid or financial support from community services. Only one in five residents (20%) reported not undertaking any of these actions.

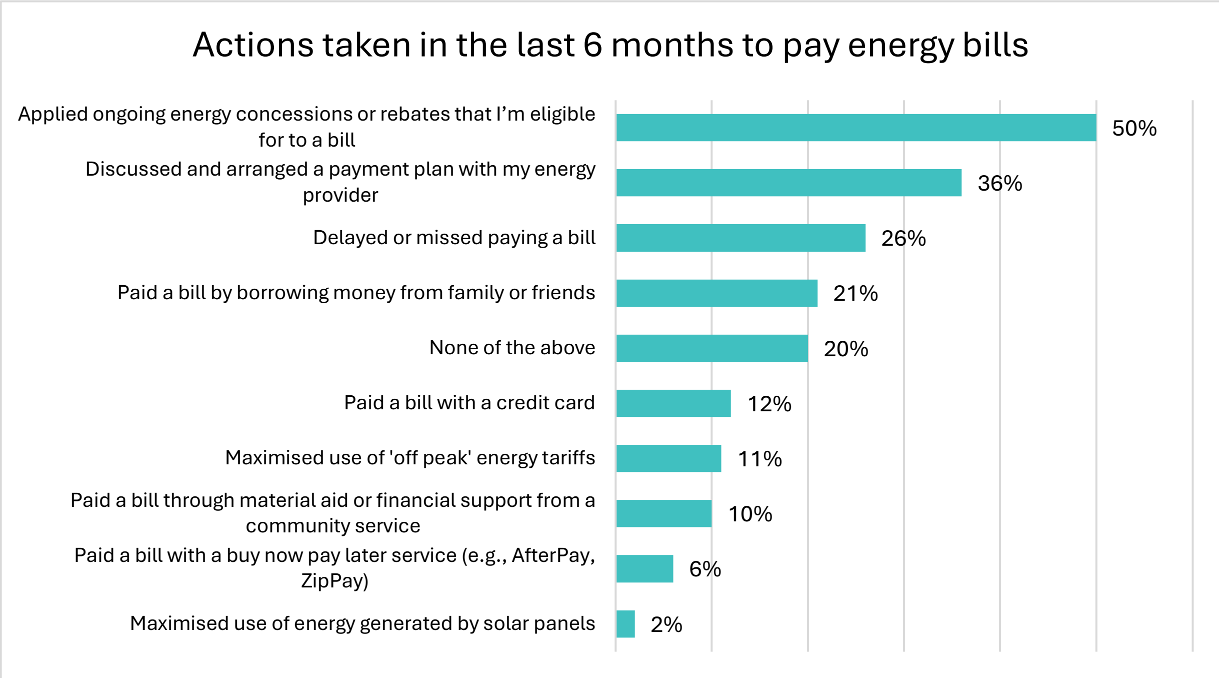

Figure 14. Actions taken to pay energy bills in the last 6 months (n=1602)

Table 19 analyses how residents' actions to manage energy costs varied according to how often they struggle to pay energy bills. Results show an escalation in coping behaviours as energy bill hardship increased. Almost half of households who reported never struggling took none of these actions (44%), compared with only 6 percent of those who struggled often and 4 percent of those who always struggled.

Applying for energy concessions or rebates was common across all groups but increased with hardship, rising from 41 percent among households who never struggled to 57 percent among those who always struggled. Engagement with energy providers also intensified, with the proportion arranging a payment plan increasing from 17 percent to 58 percent across the same groups.

More financially precarious strategies were concentrated among households experiencing frequent hardship, including borrowing money from family or friends (increasing from 2% to 48%), reliance on material aid (0% to 22%), and delaying or missing bill payments (0% to 60%). In contrast, cost optimisation strategies such as maximising off peak tariffs or solar generation were used by relatively small proportions across all groups.

Actions taken to pay energy bills	Frequency residents struggled to pay energy bills in the last year						
	Count	Never	Rarely	Sometimes	Often	Always	N/A
Applied ongoing energy concessions or rebates that I'm eligible for to a bill	765	41%	54%	54%	56%	57%	42%
Paid a bill with a credit card	181	10%	11%	16%	13%	9%	7%
Paid a bill with a buy now pay later service	96	2%	2%	6%	11%	11%	2%
Paid a bill by borrowing money from family or friends	321	2%	6%	17%	36%	48%	5%
Paid a bill through material aid or financial support from a community service	156	0%	3%	9%	17%	22%	7%
Maximised use of 'off peak' energy tariffs	167	5%	10%	11%	12%	17%	11%
Maximised use of energy generated by solar panels	33	2%	4%	2%	1%	2%	4%
Discussed and arranged a payment plan with my energy provider	552	17%	25%	37%	51%	58%	16%
Delayed or missed paying a bill	407	0%	13%	24%	40%	60%	7%
None of the above	265	44%	27%	13%	6%	4%	42%

Table 19. Actions taken to manage energy bills by frequency of bill payment difficulty (n= 1468)

In line with the quantitative results, residents' written feedback highlighted experiencing energy-related financial stress, including challenges maintaining bill payments, limiting appliance use, and balancing competing household costs.

> *"I have cut down on other items such as food or petroleum and medication to afford to pay electricity account" – Resident 569*

> *"Some days it's a struggle to decide whether you should put the air conditioning on or dryer in wet weather... Pensioners should be able to afford some comfort and not have to choose between food and comfort. The rebates are fantastic and very much appreciated but I still get bill shock even after them." – Resident 749*

Table 20 examines the actions households took to address energy costs based on the heating, cooling and energy-related features installed in their home. Results show that many households reported taking active steps to manage energy costs regardless of the systems installed, suggesting that affordability pressures are widespread across the sample.

Applying for ongoing energy concessions or rebates was the most common strategy, reported by between 43 and 56 percent of households across groups, with the highest uptake among households with ceiling fans only (56%), fixed plus solar systems (53%), and households with none of the listed features (52%). Arranging payment plans with energy providers was also common, reported by around one-third or more households across most groups (31% to 42%).

Strategies aimed at optimising energy use, such as maximising off-peak tariffs or solar-generated electricity, were reported by smaller proportions of residents and were largely concentrated among households with solar-related features, particularly those with fixed and solar systems installed.

Actions taken to pay energy bills	***Grouped categories of installed energy features***								
	Air con only	**Ceiling fans only**	**Fixed + solar**	**Fixed heating**	**Fixed systems**	**None of these options installed**	**Not sure**	**Solar hot water system only**	**Solar panels only**
Count	356	128	114	79	261	549	47	34	26
Applied ongoing energy concessions or rebates	49%	56%	53%	43%	49%	52%	43%	47%	35%
Paid a bill with a credit card	10%	16%	13%	14%	13%	12%	23%	18%	8%
Paid a bill with a buy now pay later service	7%	4%	9%	13%	3%	6%	4%	12%	8%
Paid a bill by borrowing money from family or friends	23%	13%	20%	23%	16%	23%	23%	15%	27%
Paid a bill through material aid or financial support from a community service	9%	5%	12%	13%	6%	13%	11%	9%	4%
Maximised use of 'off peak' energy tariffs	9%	9%	21%	10%	7%	11%	17%	9%	15%
Maximised use of energy generated by solar panels	1%	1%	21%	0%	0%	0%	2%	6%	12%
Discussed and arranged a payment plan with my energy provider	34%	34%	37%	42%	31%	41%	38%	24%	31%
Delayed or missed paying a bill	21%	17%	25%	37%	24%	31%	28%	15%	35%
None of the above	20%	22%	13%	15%	25%	19%	19%	29%	15%

Table 20. Actions taken to pay energy bills by installed heating and cooling features (% of households within each installed feature category by n=1594)

3.6 Education, understanding and confidence in energy billing

Respondents were asked to indicate their level of agreement with a series of statements assessing their understanding of, and engagement with, energy billing.

Overall, confidence was highest in relation to knowing where to seek assistance, with 77 percent of respondents agreeing or strongly agreeing that they know who to contact with questions about their energy bill.

By comparison, respondents reported lower levels of understanding about how bills are calculated (47%) and having sufficient information about energy usage and costs (49%). Fewer than half of respondents (44%) agreed they had received clear and helpful education about energy bills. Responses regarding difficulties understanding written billing information were mixed: equal proportions agreed and disagreed (35% respectively), while a substantial proportion neither agreed nor disagreed. Physical or cognitive barriers were less commonly reported, with a majority (55%) of respondents disagreeing that these impeded their level of understanding. Notably, 43 percent of respondents indicated a desire for additional information about energy and billing, suggesting scope for improved communication and support from participating providers.

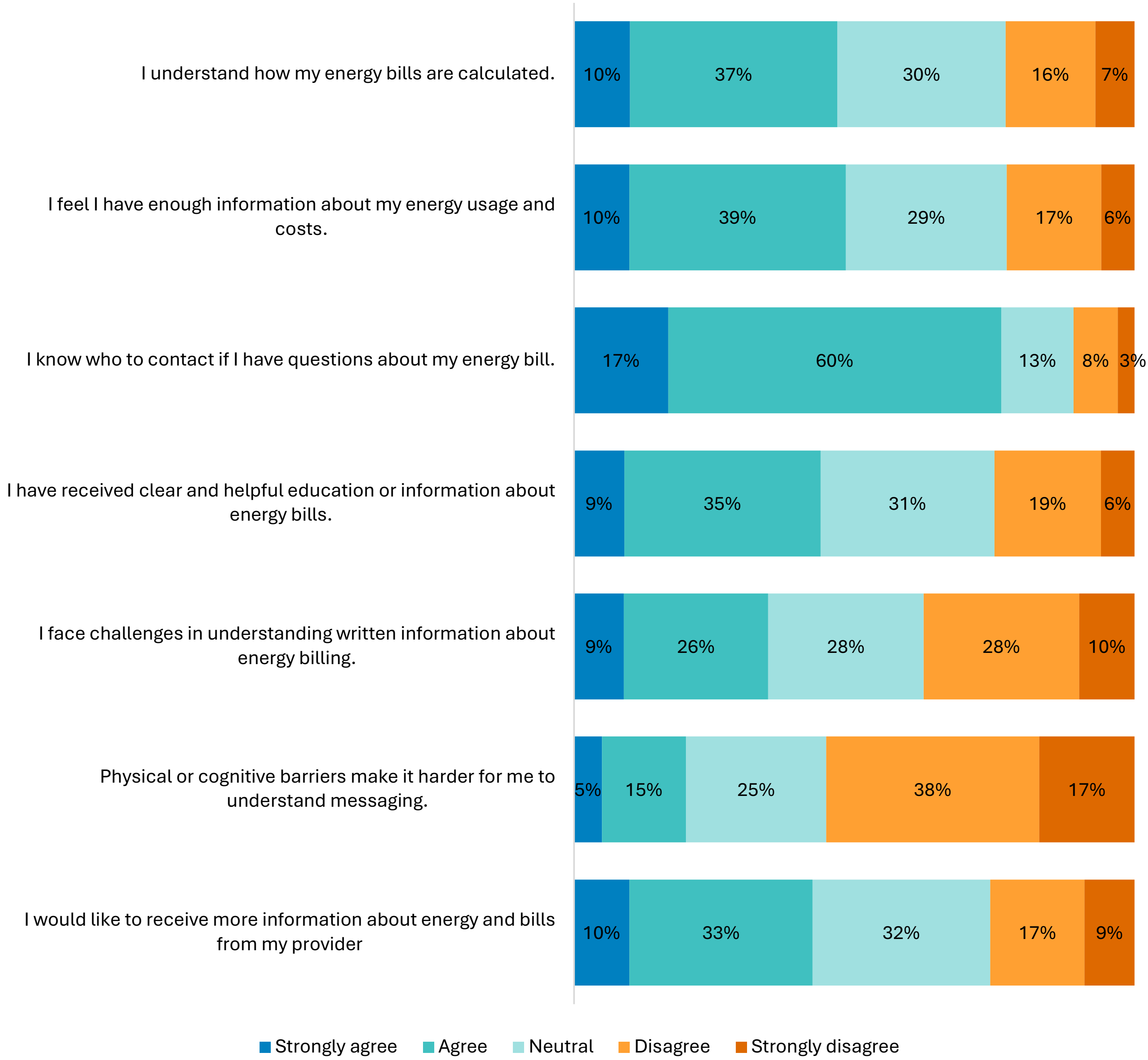

Figure 15. Reported understanding of energy bills, billing information, and support pathways

3.6.1 Barriers to accessing and understanding energy information

Written feedback reinforced these survey findings, highlighting some residents continue to experience uncertainty and anxiety when navigating energy billing systems:

> *"Please help me figure out how to save my money on energy" – Resident 1398*

Comments frequently pointed to limited awareness of available assistance programs, uncertainty about tariff structures such as peak and off-peak rates, and difficulty identifying the most suitable energy providers or plans:

> *"I'm worried to use appliances and turn off from the switch. I do not know peak and off peak rates. I don't know how much I use and stress about bills and disconnection" – Resident 1422*

Some respondents also described emotional barriers to seeking support, noting that stigma, digital access challenges, or complex application processes could discourage engagement with assistance programs even when help was available.

> *"There needs to be a better reach of programs available to people living in public housing. It's often embarrassing as it is being on financial aid, but then to have to go looking and asking for help is often to [sic] hard a pill for people to swallow and a lot of the times too difficult to achieve for a lot of people that do not have a way to apply online/over the phone." – Resident 320*

Resident responses also suggested that clearer, more proactive communication from housing providers and energy retailers could help improve confidence and reduce stress associated with energy use:

> *"I'd like more information and guidance from [housing provider] as to the best way to use and select the best option for energy providers. Also wonder why there's no solar panels on our building as surely they would contribute to cheaper electricity costs." – Resident 276*

Overall, qualitative feedback indicates that while many residents know where to seek help, there remains a substantial need for accessible, targeted education and personalised support to strengthen energy literacy and enable households to make informed decisions about their energy use and costs.

3.6.2 Energy literacy across population groups

To best understand how education and knowledge was impacted by demographic variables, analysis of responses to these questions was conducted both by age groups and cultural background.

As seen in Table 21, understanding of energy bills varied across age groups. Across all ages, fewer than one in six residents strongly agreed that they understood how their energy bills were calculated, while neutral responses were more common among those aged 26-45 (38-39%). Similar patterns were evident in perceptions of having enough information about energy usage and costs, with fewer than half of respondents in any age group agreeing and notable levels of disagreement among those aged 26-55 (ranging between 20% and 25%)

In contrast, most residents across all age groups reported knowing who to contact if they had questions about their energy bill. However, fewer residents felt they had received clear and helpful education about energy bills, particularly among older age groups, where agreement ranged from 38 percent among those aged 66 to 75 to 37 percent among those aged 76 and over. Challenges in understanding written energy billing information affected approximately one third of residents across all ages, while physical or cognitive barriers were less commonly reported, but remained relevant for a minority, particularly among younger and mid-aged adults.

Analysis by cultural background (see Table 22) demonstrated that Aboriginal and or Torres Strait Islander residents and migrant residents were more likely to report uncertainty about how their energy bills were calculated, with around one third selecting neutral responses, compared with Australian born non-Aboriginal and/or Torres Strait Islander residents.

Across all cultural groups, fewer than 40 percent of residents agreed that they had sufficient information about their energy usage and costs, and less than half agreed that they had received clear and helpful education about energy bills (ranging from 30%-38%). While these patterns were broadly consistent, migrant residents recorded slightly higher levels of neutrality and disagreement across several indicators. In particular, migrant residents were more likely to report being neutral about knowing who to contact with questions about their energy bill (18%, compared with 9% among Australian-born non-Aboriginal and/or Torres Strait Islander residents), suggesting lower confidence in navigating support pathways. Around one in five Aboriginal and or Torres Strait Islander and migrant residents disagreed that energy information was clear (22% and 25% respectively), and around one third of residents across all groups reported challenges in understanding written billing information (33% overall).

	Age						
	18 - 25	26 - 35	36 - 45	46 - 55	56 - 65	66 - 75	76 +
Count	75	116	202	309	416	292	141
I understand how my energy bills are calculated.							
Strongly agree	16%	12%	10%	12%	7%	6%	9%
Agree	40%	28%	29%	38%	35%	43%	38%
Neutral	29%	38%	39%	26%	31%	23%	25%
Disagree	13%	14%	15%	16%	17%	15%	14%
Strongly disagree	1%	8%	8%	9%	6%	5%	6%
I feel I have enough information about my energy usage and costs.							
Strongly agree	13%	12%	10%	11%	9%	6%	7%
Agree	44%	29%	29%	37%	38%	39%	41%
Neutral	31%	37%	35%	27%	26%	22%	23%
Disagree	7%	16%	19%	14%	18%	20%	11%
Strongly disagree	4%	6%	6%	9%	4%	3%	6%
I know who to contact if I have questions about my energy bill.							
Strongly agree	19%	23%	18%	18%	13%	17%	14%
Agree	57%	49%	56%	58%	61%	58%	56%
Neutral	13%	15%	18%	12%	12%	12%	10%
Disagree	9%	9%	2%	7%	8%	8%	9%
Strongly disagree	1%	4%	3%	4%	2%	1%	2%
I have received clear and helpful education or information about energy bills.							
Strongly agree	11%	14%	8%	10%	8%	6%	6%
Agree	45%	31%	32%	33%	37%	32%	31%
Neutral	27%	34%	36%	31%	25%	29%	29%
Disagree	12%	13%	18%	16%	21%	21%	14%
Strongly disagree	5%	7%	6%	8%	5%	3%	7%
I face challenges in understanding written information about energy billing.							
Strongly agree	5%	10%	9%	10%	8%	7%	7%
Agree	32%	32%	27%	21%	26%	27%	12%
Neutral	27%	32%	34%	26%	24%	22%	26%
Disagree	27%	16%	21%	29%	29%	28%	30%
Strongly disagree	9%	9%	8%	11%	9%	7%	11%
Physical or cognitive barriers make it harder for me to understand messaging.							
Strongly agree	3%	9%	6%	7%	4%	4%	3%
Agree	25%	17%	15%	11%	15%	14%	8%
Neutral	17%	28%	29%	25%	22%	23%	23%
Disagree	40%	27%	34%	39%	38%	35%	34%
Strongly disagree	15%	17%	14%	16%	16%	14%	17%

Table 21. Energy literacy, billing knowledge and education by age group (n=1558)

	Cultural background			
	Aboriginal and/or Torres strait	Born in Australia (not Aboriginal/	Migrant (not born in Australia)	None of the above
Count	300	793	312	175
I understand how my energy bills are calculated.				
Strongly agree	10%	9%	7%	12%
Agree	33%	38%	36%	38%
Neutral	31%	28%	30%	31%
Disagree	16%	15%	18%	11%
Strongly disagree	8%	7%	6%	6%
I feel I have enough information about my energy usage and costs.				
Strongly agree	9%	9%	7%	11%
Agree	35%	36%	36%	43%
Neutral	30%	26%	30%	22%
Disagree	14%	17%	16%	17%
Strongly disagree	8%	6%	5%	3%
I know who to contact if I have questions about my energy bill.				
Strongly agree	15%	19%	13%	18%
Agree	58%	58%	55%	60%
Neutral	15%	9%	18%	15%
Disagree	8%	9%	5%	5%
Strongly disagree	2%	3%	3%	2%
I have received clear and helpful education or information about energy bills.				
Strongly agree	8%	9%	6%	11%
Agree	38%	33%	30%	38%
Neutral	30%	29%	33%	24%
Disagree	15%	18%	20%	18%
Strongly disagree	7%	7%	5%	5%
I face challenges in understanding written information about energy billing.				
Strongly agree	10%	9%	7%	6%
Agree	26%	22%	27%	28%
Neutral	28%	25%	24%	33%
Disagree	25%	28%	27%	23%
Strongly disagree	8%	10%	9%	8%
Physical or cognitive barriers make it harder for me to understand messaging.				
Strongly agree	7%	5%	4%	7%
Agree	17%	12%	13%	19%
Neutral	24%	24%	27%	22%
Disagree	37%	37%	33%	34%
Strongly disagree	10%	17%	17%	15%

Table 22. Knowledge and education of energy bills by cultural background (n=1555)

4 Conclusion

This report is a comprehensive empirical account of energy hardship within Australia's community housing sector, drawing on a large, multi-jurisdictional resident survey to examine how thermal comfort, housing conditions, and affordability intersect across different climatic and socio-demographic contexts. The findings demonstrate that energy hardship is both prevalent and shaped by social and structural factors, across the sampled sector, reflecting the combined influence of low household incomes, ageing dwelling stock, and exposure to climatic extremes.

Across all climate zones, a substantial proportion of residents reported recurrent exposure to unsafe or unhealthy indoor temperatures, frequent thermal discomfort, and financial strain associated with energy costs. Behavioural responses to rising energy costs were widespread, with most households reducing heating or cooling, limiting appliance use, and cutting back on essential expenditure. While these responses were observed even among households with installed heating, cooling, or solar technologies, they were consistently more pronounced among households who reported none of the energy features listed in the survey. This suggests that households lacking these features may face greater challenges in maintaining thermal comfort and managing energy costs, although the relationship is likely influenced by a range of factors, including household and dwelling characteristics. Overall, these findings suggest that deeper interventions will be necessary to address energy hardship in the context of rising energy costs and poor building performance.

Housing conditions emerged as a central determinant of both thermal comfort and health related outcomes. Households without fixed heating or cooling systems were more likely to report frequent unsafe temperatures, greater thermal discomfort, and higher rates of temperature-related health impacts. These patterns are consistent with the wider literature on the relationship between building quality, thermal performance, and energy vulnerability (Daniel et al., 2020; Chen & Feng, 2022), and reflect the legacy of an ageing and inefficient community housing portfolio.

Energy hardship was also socially differentiated. Aboriginal and or Torres Strait Islander residents, larger households, and lower income groups were more commonly represented among those experiencing persistent difficulty paying energy bills. Furthermore, across all age and cultural groups, levels of energy literacy and confidence in billing systems were low, with fewer than half of respondents reporting that they understood how their bills were calculated or that they had access to clear and helpful information. This combination of economic disadvantage, housing inefficiency, and informational disadvantage constrains residents' capacity to manage energy use in ways that protect both health and financial security.

Ultimately, these findings reinforce energy hardship as multidimensional, shaped by the interaction between income, housing quality, infrastructure, and institutional arrangements. This report demonstrates that upgrading the energy performance of community housing represents a high-impact investment that will deliver health benefits and cost of living relief. Exposure to thermal risk and financial stress within community housing is shaped by systemic factors, including a constrained funding environment and complex ownership and management arrangements. Residents have limited capacity to modify the physical characteristics of their dwellings, while providers lack access to necessary funding to deliver upgrades at scale. Addressing energy hardship therefore requires the establishment of a long-term funding stream, coupled with coordinated action across government and industry.

Qualitative responses further expand on resident priorities and experiences, illustrating that energy hardship is experienced not only as financial strain, but as an everyday disruption to health, sleep, mobility, and household functioning. Residents described adopting extreme coping strategies, including sleeping in different parts of the dwelling, avoiding appliance use despite unsafe temperatures, or leaving the home to seek relief during periods of heat or cold. Many residents also expressed strong desire for structural improvements such as insulation, fixed heating and cooling, and solar systems, reinforcing that energy hardship is inextricably linked to dwelling infrastructure, rather than being based on income and appliance use alone. Without sustained investment in comprehensive building upgrades, many households will remain locked into a cycle of elevated energy demand, constrained energy use, and ongoing vulnerability to climate and price shocks.

An important limitation of the present study is the absence of detailed data on dwelling form, construction type, and building materials. While the analysis demonstrates clear associations between installed energy systems and resident outcomes, it was not possible to examine how building fabric, insulation, glazing, orientation, or dwelling typology mediate thermal performance and energy demand. Given the centrality of these factors in existing literature, this represents a critical gap in the current evidence base and limits the capacity to target retrofit interventions to those properties that generate the greatest risk for residents. Future research should prioritise the collection and integration of detailed dwelling data, enabling more precise identification of high-risk housing stock, and supporting the development of targeted, cost-effective retrofit and investment strategies.

The findings also highlight the value of embedding energy hardship and thermal comfort measures within routine resident data collection. Incorporating standardised indicators into ongoing resident surveys would enable longitudinal tracking of outcomes, facilitate linkage between resident experience and dwelling attributes, and support more robust evaluation of retrofit programs and policy interventions. Public reporting of these measures would further support transparency and accountability, positioning energy hardship as a system level performance issue rather than an individualised household problem.

By integrating resident reported experience with dwelling performance and affordability metrics, the community housing industry will be better placed to develop a coherent, evidence-informed approach to energy hardship. Such an approach is essential for guiding investment in energy efficiency upgrades, strengthening sector wide advocacy, and supporting the delivery of housing that provides not only affordability, but also thermal safety, health protection, and resilience under a changing climate.

5 Appendix

Appendix A. Survey questions

Community Housing
Household Energy Survey

About you

Q1 What is your age?

- ☐ Less than 18 years old
- ☐ 18 - 25
- ☐ 26 - 35
- ☐ 36 - 45
- ☐ 46 - 55
- ☐ 56 - 65
- ☐ 66 - 75
- ☐ 76 and over
- ☐ Prefer not to answer

Q2 What is your gender?

- ☐ Man
- ☐ Woman
- ☐ Non-binary
- ☐ Prefer not to diclose

Q3 How would you describe your cultural background?

- ☐ Aboriginal and/or Torres Strait Islander
- ☐ Born in Australia (not Aboriginal and/or Torres Strait Islander)
- ☐ Migrant (not born in Australia)
- ☐ None of the above

Q4 What is your postcode?

☐

Q5 How many people live in your household?

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6 or more

Q6 What is your weekly household income (after tax i.e. what you receive in your account)

- ☐ No income
- ☐ $1-$299 ($7,800-$15,599)
- ☐ $300-$499 ($15,600-$25,999)
- ☐ $500-$799 ($26,000-$41,599)
- ☐ $800-$1,249 ($41,600-$64,999)
- ☐ $1,250-$1,749 ($65,500-$90,999)
- ☐ $1,750 -$2,499 ($91,000-$129,999)
- ☐ Above $2,500 ($130,000 +)

Q7 What is your property type?

- ☐ Detached house
- ☐ Semi-detached
- ☐ Villa/Townhouse
- ☐ Unit/apartment

Your Household and Energy Use

Q8 Approximately how many hours per day (24hr period) is someone usually home, during the week (Monday - Friday)

- ☐ less than 4 hrs
- ☐ 4 - 8 hrs
- ☐ 8 - 12 hrs
- ☐ 12 - 16 hrs
- ☐ 16 - 20 hrs
- ☐ more than 20 hrs

Q9 Approximately how many hours per day (24hr period) is someone usually home, during the weekend (Saturday - Sunday)

- ☐ less than 4 hrs
- ☐ 4 - 8 hrs
- ☐ 8 - 12 hrs
- ☐ 12 - 16 hrs
- ☐ 16 - 20 hrs
- ☐ more than 20 hrs

Q10 What type of energy is used in your home for the following activities? (Select one option for each activity)

	Gas	Electricity	Solid fuel (e.g. wood)	Don't know
Cooking	☐	☐	☐	☐
Heating your home	☐	☐	☐	☐
Cooling your home	☐	☐	☐	☐

Q11 Does your home have any of the following installed?

- ☐ Solar hot water system
- ☐ Solar panels
- ☐ Air conditioning
- ☐ Ceiling fans
- ☐ Radiator or fixed heating system
- ☐ Not sure
- ☐ None of the above

Q12 Do you use any of the following to stay cool or warm?

- ☐ Portable fan
- ☐ Portable heater
- ☐ I don't use heating and cooling appliances
- ☐ Wear extra layers
- ☐ Have hot drinks
- ☐ Have hot/cold showers
- ☐ Other

Comfort and Energy use

Q13 In the last 12 months have you done any of the following because of rising energy prices? *select all that apply

- ☐ Heated/cooled your home less
- ☐ Left your home to seek more comfortable environments
- ☐ Had fewer hot showers
- ☐ Limited the number of hot meals you cooked
- ☐ Avoided using appliances (e.g. washing machine or TV)
- ☐ Reduced spending on essential items (e.g. food or medicine)
- ☐ Missed rent payments
- ☐ Changed energy provider or plan
- ☐ None of the above

Q14 How much have the following applied to you?

	Never	Rarely	Sometimes	Often	Always	N/A
In winter, I have been at an uncomfortable temperature because I cannot afford to use heating	☐	☐	☐	☐	☐	☐
In summer, I have been at an uncomfortable temperature because I cannot afford to use cooling	☐	☐	☐	☐	☐	☐
In the past year I have struggled to pay energy bills	☐	☐	☐	☐	☐	☐
The temperature of my home has contributed or worsened my health or the health of other occupants	☐	☐	☐	☐	☐	☐

Q15 In the past year, approximately how often was your home at a temperature that you felt was unsafe or unhealthy?

- ☐ Never
- ☐ 1 -2 months
- ☐ Some months
- ☐ Almost every month

Q16 In the past year, was there ever a time your household was unable to use your main source of heating or cooling because the following happened? *Select all that apply

- ☐ Your heating equipment was broken and you couldn't afford to pay for the repair or replacement
- ☐ You couldn't pay for electricity or gas and it was disconnected
- ☐ None of these happened

Energy payments and support

Q17 I am aware of government programs that can assist with paying or reducing my energy bills

- ☐ Yes
- ☐ No

Q18 In the past 6 months, have you undertaken any of the following to pay your energy bills? *select all that apply

- ☐ Applied ongoing energy concessions or rebates that I'm eligible for to a bill
- ☐ Paid a bill with a credit card
- ☐ Paid a bill with a buy now pay later service (e.g., AfterPay, ZipPay)
- ☐ Paid a bill by borrowing money from family or friends
- ☐ Paid a bill through material aid or financial support from a community service
- ☐ Maximised use of 'off peak' energy tarifs
- ☐ Maximised use of energy generated by solar panels
- ☐ Discussed and arranged a payment plan with my energy provider
- ☐ Delayed or missed paying a bill
- ☐ None of the above

Q19 Please indicate how much you agree or disagree with the following statements.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I understand how my energy bills are calculated.	☐	☐	☐	☐	☐
I feel I have enough information about my energy usage and costs.	☐	☐	☐	☐	☐
I know who to contact if I have questions about my energy bill.	☐	☐	☐	☐	☐
I have received clear and helpful education or information about energy bills.	☐	☐	☐	☐	☐
I face challenges in understanding written information about energy billing.	☐	☐	☐	☐	☐
Physical or cognitive barriers make it harder for me to understand messaging.	☐	☐	☐	☐	☐
I would like to receive more information about energy and bills from my provider	☐	☐	☐	☐	☐

Q20 Is there anything you'd like to share about energy in your home? (if no press submit)

Thank you for completing this survey.

Appendix B. Participant demographics

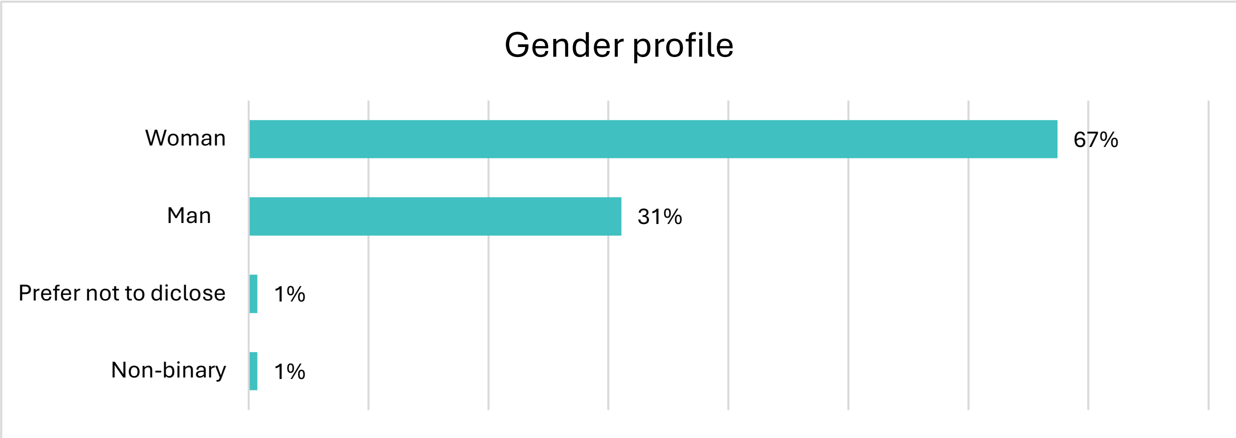

Figure 16. Gender profile of respondents (n=1618)

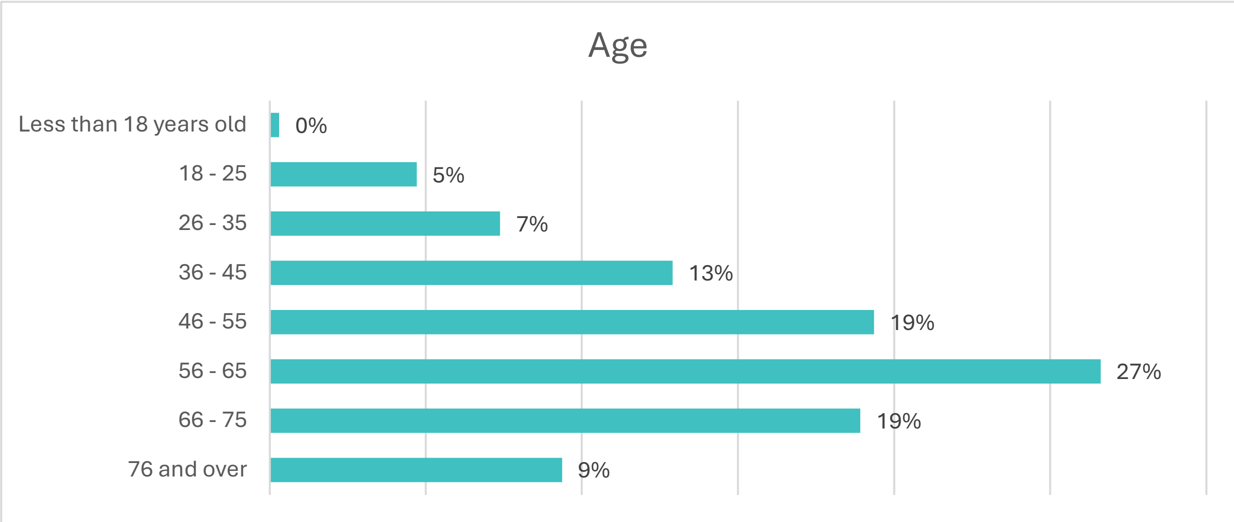

Figure 18. Age profile of respondents. (n=1615)

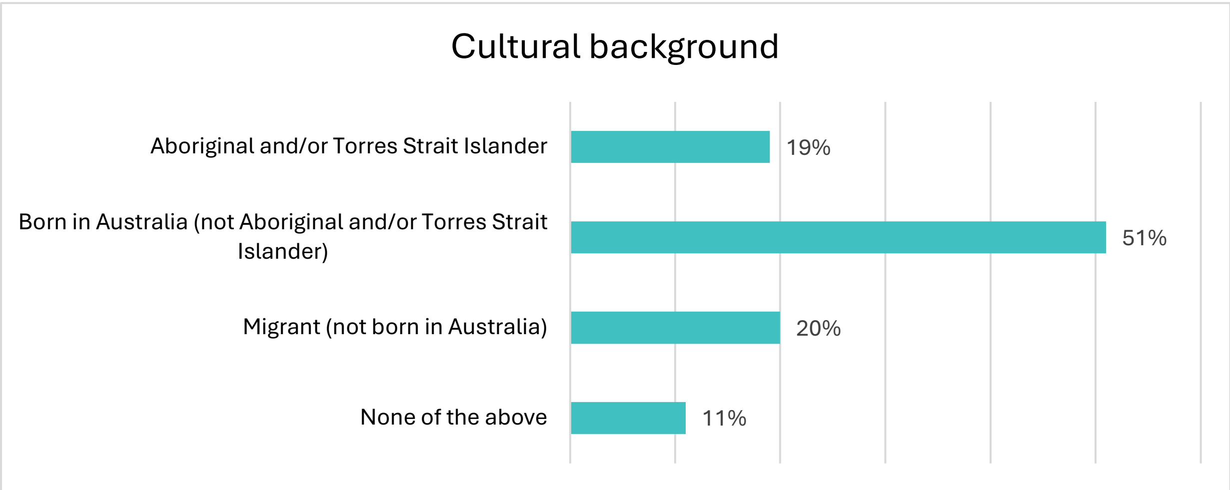

Figure 17. Response profile by cultural background (n=1607)

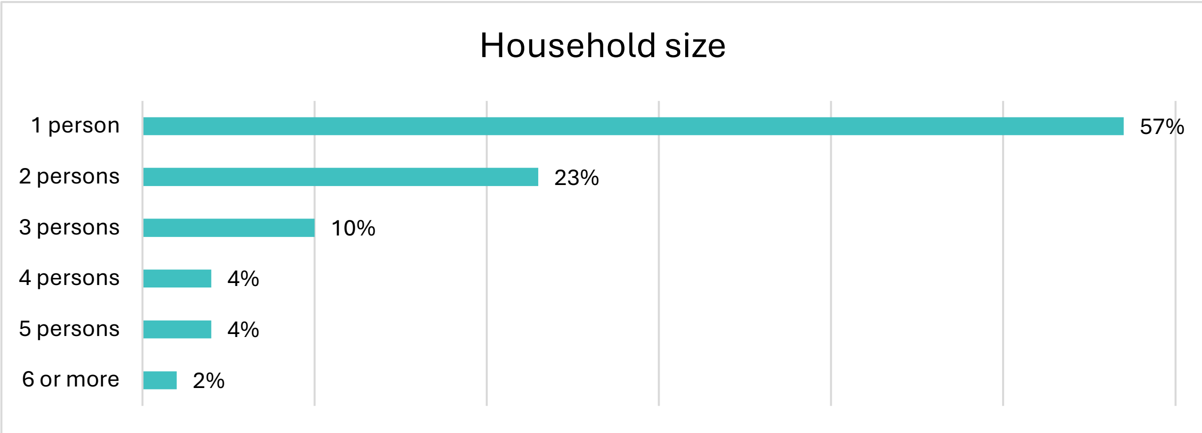

Figure 19. Response profile by participant household size (n =1613)

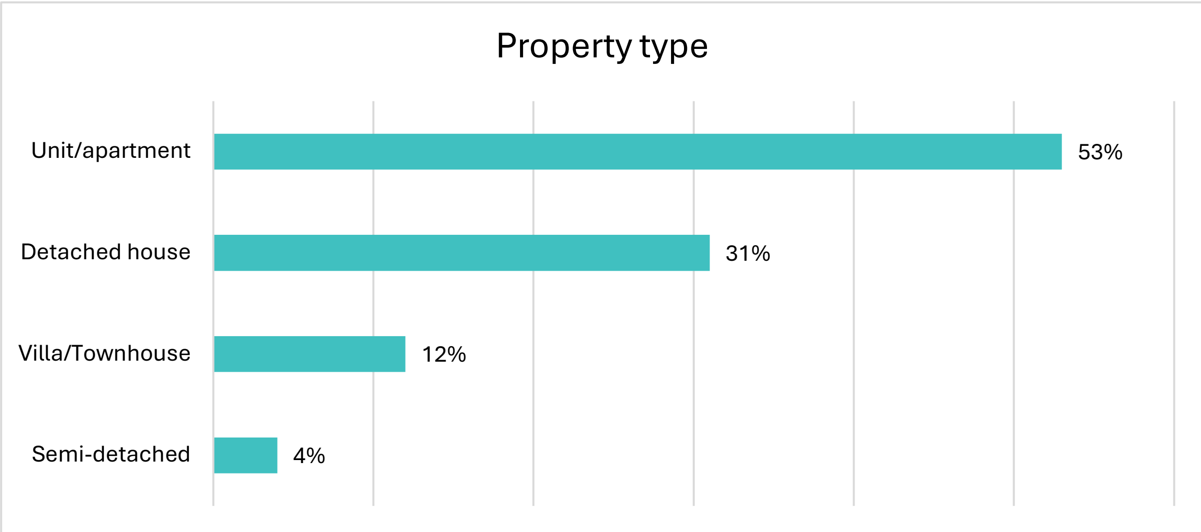

Figure 20. Participant property type (n=1606)

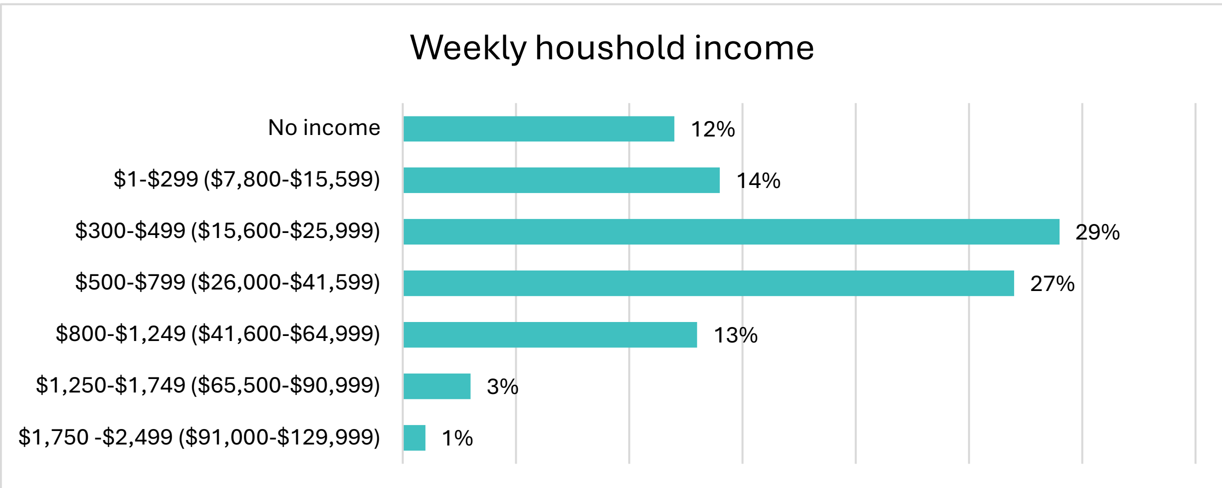

Figure 21. Weekly household income (n=1581)

Appendix C. Demographics by climate zone

Table 23. Age grouping by climate zones (n=1613)

Age	Total	Zone 4	Zone 5	Zone 6	Zone 7
Count	1613	267	736	513	97
18 - 25	5%	13%	1%	4%	13%
26 - 35	7%	16%	4%	7%	8%
36 - 45	13%	13%	8%	18%	21%
46 - 55	19%	19%	20%	18%	21%
56 - 65	27%	17%	31%	25%	24%
66 - 75	19%	14%	22%	19%	7%
76 and over	9%	7%	12%	7%	6%
Less than 18	0%	1%	0%	0%	0%

Table 24. Cultural background by climatic zone (n=1604)

Cultural Background	Total	Zone 4	Zone 5	Zone 6	Zone 7
Count	1604	266	730	512	97
Aboriginal and/or Torres Strait	19%	51%	9%	16%	25%
Born in Australia (not Aboriginal	51%	37%	55%	51%	58%
Migrant (not born in Australia)	20%	3%	28%	21%	4%
None of the above	11%	12%	9%	13%	13%

Table 25. Household size by climate zone (n=1612)

Household size	Zone 4	Zone 5	Zone 6	Zone 7
Count	264	735	515	97
1	46%	64%	53%	55%
2	22%	22%	26%	27%
3	13%	8%	11%	11%
4	6%	3%	5%	4%
5	9%	2%	3%	3%
6 or more	4%	1%	1%	-

Appendix D. Hours spent at home by demographics

Table 26. Hours spent at home during the week and weekend by age (n= 1600)

Age	**<18**	**18 - 25**	**26 - 35**	**36 - 45**	**46 - 55**	**56 - 65**	**66 - 75**	**76 +**
Count	**5**	**76**	**118**	**206**	**312**	**427**	**300**	**151**
During the week								
less than 4 hrs	20%	0%	2%	2%	2%	1%	0%	3%
4 - 8 hrs	20%	16%	14%	14%	10%	9%	6%	3%
8 - 12 hrs	40%	9%	18%	15%	13%	12%	8%	7%
12 - 16 hrs	0%	24%	16%	15%	19%	17%	14%	11%
16 - 20 hrs	0%	22%	12%	14%	17%	18%	24%	25%
20hrs +	20%	29%	39%	39%	38%	42%	48%	49%
Weekend								
less than 4 hrs	20%	3%	3%	1%	4%	2%	0%	2%
4 - 8 hrs	0%	8%	8%	9%	5%	7%	5%	3%
8 - 12 hrs	60%	17%	13%	16%	12%	11%	9%	5%
12 - 16 hrs	0%	14%	15%	13%	14%	14%	13%	11%
16 - 20 hrs	20%	30%	20%	16%	23%	23%	27%	20%
more than 20 hrs	0%	28%	40%	44%	43%	43%	45%	59%

Table 27. hours spent at home during the week and weekend, by gender (n=1603)

Gender	**Man**	**Woman**	**Non-binary**	**Prefer not to disclose**
Count	**501**	**1079**	**11**	**12**
During the week				
Less than 4 hrs	3%	1%	9%	0%
4 - 8 hrs	8%	10%	9%	17%
8 - 12 hrs	16%	10%	9%	8%
12 - 16 hrs	17%	15%	0%	17%
16 - 20 hrs	22%	17%	27%	17%
More than 20 hrs	34%	46%	45%	42%
Weekend				
Less than 4 hrs	2%	2%	9%	8%
4 - 8 hrs	6%	6%	0%	8%
8 - 12 hrs	15%	10%	9%	-
12 - 16 hrs	17%	12%	0%	-
16 - 20 hrs	24%	22%	27%	42%
More than 20 hrs	36%	48%	55%	42%

Table 28. Hours spent at home during the week and weekend by cultural background (n= 1592)

	Aboriginal and/or Torres Strait Islander	Born in Australia (not Aboriginal and/or Torres Strait Islander)	Migrant (not born in Australia)	None of the above
Count	308	809	321	179
During the week				
less than 4 hrs	1%	1%	2%	3%
4 - 8 hrs	12%	8%	11%	9%
8 - 12 hrs	12%	12%	10%	15%
12 - 16 hrs	17%	15%	17%	15%
16 - 20 hrs	13%	20%	21%	17%
more than 20 hrs	44%	44%	38%	41%
Weekend				
less than 4 hrs	3%	1%	3%	3%
4 - 8 hrs	7%	5%	8%	4%
8 - 12 hrs	10%	12%	9%	16%
12 - 16 hrs	13%	12%	17%	13%
16 - 20 hrs	21%	24%	25%	18%
More than 20hrs	46%	46%	38%	45%

Appendix E. Categorisation groups of energy features installed

Row Labels	Count
Air conditioning only	**359**
Air conditioning	350
Air conditioning, None of these options	3
Air conditioning, not sure	6
Ceiling fans only	**131**
Ceiling fans	127
Ceiling fans, not sure	4
Fixed + solar	**114**
Solar hot water system, Air conditioning	18
Solar hot water system, Solar panels	3
Solar hot water system, Solar panels, Air conditioning	5
Solar hot water system, Solar panels, Air conditioning, Ceiling fans	6
Solar hot water system, Solar panels, Air conditioning, Radiator or fixed heating system	2
Solar hot water system, Solar panels, Ceiling fans	1
Solar panels, Air conditioning	49
Solar panels, Air conditioning, Ceiling fans	15
Solar panels, Air conditioning, Ceiling fans, Radiator or fixed heating system	2
Solar panels, Air conditioning, Radiator or fixed heating system	6
Solar panels, Ceiling fans	3
Solar panels, Radiator or fixed heating system	4
Fixed heating	**80**
Radiator or fixed heating system	78
Radiator or fixed heating system, None of these options	2
Fixed systems	**261**
Air conditioning, Ceiling fans	165
Air conditioning, Ceiling fans, none of these options	1
Air conditioning, Ceiling fans, not sure	4
Air conditioning, Ceiling fans, Radiator or fixed heating system	29
Air conditioning, Radiator or fixed heating system	34
Ceiling fans, Radiator or fixed heating system	8
Ceiling fans, Radiator or fixed heating system, not sure	1
Solar hot water system, Air conditioning, Ceiling fans	5
Solar hot water system, Air conditioning, Ceiling fans, Radiator or fixed heating system	3
Solar hot water system, Air conditioning, Radiator or fixed heating system	3
Solar hot water system, Ceiling fans	6
Solar hot water system, Ceiling fans, Radiator or fixed heating system	1
Solar hot water system, Radiator or fixed heating system	1
Not sure	**49**
Not sure	49
None of the listed features installed	**554**
None of these options	548
Not sure, None of these options	6
Solar hot water system only	**34**
Solar hot water system	30
Solar hot water system, None of these options	4
Solar panels only	**26**
Solar panels	26
Total	**1608**

Appendix F. Thematic coding of comments, counts and themes

Node	Count
Affordability	
General commentary on affordability or cost	85
Debt	9
Efficiency	5
Solar	5
Trade offs	13
Unaffordable or financial stress	21
Coping strategies	
DIY or self-adaptations	64
Portable appliances	22
Energy type	
Gas	11
Electricity	3
Health	
Age	2
Health or chronic illness	40
Mental health	5
Housing condition	0
Build or positioning	27
Condition	0
Damaged	15
Old property or systems	40
Insulation	58
Ventilation	14
Overall comfortable	6
Payment plan arranged	23
Preferences	
Aircon	40
Reverse cycling	11
Education	20
Efficient appliances	7
Installed features	22
Payment schemes	19
Solar	107
Thermal comfort	
Cold/Too cold	43
Hot/Too hot	53

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