RACE for 2030

Scenarios for Future Living

SECTION 4: HARDSHIP AND ACCESS INEQUITIES — WEAK POINTS FOR RESILIENCE

HOUSEHOLD AND HOME BUSINESSES RESEARCH:

EMERGING LIFESTYLES, PREFERENCES AND PRACTICES

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Putting people at the centre of the energy transition

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Project team

Research partner

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Acknowledgement of Country

The authors of this report would like to respectfully acknowledge the Traditional Owners of the ancestral lands throughout Australia and their connection to land, sea and community. We recognise their continuing connection to the land, waters and culture and pay our respects to them, their cultures and to their Elders past, present, and emerging.

What is RACE for 2030?

RACE for 2030 CRC is a 10-year cooperative research program with AUD350 million of resources to fund research towards a reliable, affordable, and clean energy future.

Disclaimer

The authors have taken all reasonable care to ensure that the information in this report was accurate at the time of publication. However, they accept no responsibility for any loss or damage that may result from reliance on its contents.

This document presents findings from Section 4 of the main report. To view the complete findings, research design, and sociodemographic overview of household respondents, please refer to the main report. Four section summaries have been produced in total.

Section 1	Consumer Energy Resources (CER) — Homeownership, household type, and income matter
Section 2	Demand-Side Management (DSM) and Household Routines — Home business and working-from-home (WFH) households present opportunities for DSM initiatives
Section 3	Future Smart Appliance Automation and V2G — Connected futures
Section 4	**Hardship and Access Inequities — Weak points for resilience**

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SUMMARY OF KEY FINDINGS

Section 4: Hardship and access inequities: weak points for resilience

ENERGY-RELATED HARDSHIP: CONCENTRATED AMONG YOUNGER, LOWER-INCOME, AND DISADVANTAGED HOUSEHOLDS

- Over 1 in 3 households reported hardship in the past year (38%), most commonly experienced as being unable to afford essentials (15%) or pay electricity bills on time (13%).
- The likelihood of experiencing at least one of the above forms of energy-related hardship decreased as age increased, with over half of 18—34-year-olds reporting hardship, compared with just 11% of those aged 75+.
- Hardship was highest among lower-income households (48% earning <$40k) and declined steadily with income (27% earning >$241k). One-parent households (57%) and residents of aged care (84%), cooperative (76%), and social/affordable housing (65%) reported the highest levels of hardship.
- Aboriginal and/or Torres Strait Islander households (66%) and households with a member with a disability (51%) also reported elevated hardship.
- **Energy hardship was heavily shaped by the interaction of income and housing tenure, affecting middle-income households just as much as low-income renters, demonstrating how energy stress can be linked to broader mortgage or housing cost stress.**

CLIMATE RISK AREAS: HARDSHIP COMPOUNDED BY EXPOSURE

- More than a third of households (36%) self-reported living in climate risk zones, most commonly bushfire (16%), flood (14%), or blackout-prone areas (13%).
- Hardship was more than twice as common among households in self-identified climate risk areas (54%) compared with those outside them (24%).
- **Climate change-induced risk is recognised by a significant proportion of Australian households and is increasing their hardship.**

Section 4: Hardship and access inequities: weak points for resilience

TECHNOLOGIES IN THE HOME: UNEVEN OWNERSHIP LIMITS OPPORTUNITIES TO PARTICIPATE IN DEMAND RESPONSE INITIATIVES, REDUCE ENERGY DEMAND, OR IMPROVE HEALTH AND COMFORT OUTCOMES

- Current ownership of the surveyed technologies was modest: induction cooktops (25%), heat pump hot water systems (23%), and energy monitoring apps (14%), while 12% of households had none of the listed technologies (e.g. refrigerated air conditioners, induction cooktops, double-glazed windows).
- Fewer than 10% of households intended to install any one technology in the next year, with air purifiers, smart appliances, and induction cooktops (each 9%) being the most cited. Nearly half (44%) planned no installations at all.
- **Technology-led demand management may be affected by low interest in and slow uptake of new energy technologies and smart appliances.**

COOLING: UNEQUAL ACCESS TO REFRIGERATED AIR CONDITIONING POSES GROWING RISKS WITH HOTTER SUMMERS

- While 56% of households reported having refrigerated air conditioning, renters (52%), government-assisted residents (64%), cooperative (68%), and aged care households (61%) were least likely to have it.
- Hardship households were less likely to have A/C (49%) than those not in hardship (61%), and the gap was starker in climate risk areas (46% vs 61%).
- **Inequalities in access to air-conditioning are likely to increase health and comfort inequities amidst rising summer temperatures.**

AIR QUALITY: MIXED CONCERNS, NATURAL VENTILATION PREFERRED

- Over half of households (57%) expressed concern about indoor air quality, most commonly allergens (31%), mould (29%), odours (22%), and health-related issues like germs (20%) or cooking pollutants (18%). Bushfire smoke was also a concern (14%).
- The most common way of managing air quality inside homes was natural ventilation, such as opening windows or doors (27%). This was followed by using ceiling fans (16%), closing windows or doors (15%), and using standalone air purifiers (12%).
- Fifty-seven per cent of all households reported concern about indoor air quality, rising in climate risk households (67%) and hardship households (71%). Concern peaked among those facing both challenges, three-quarters of whom worried about air quality.
- **Those with the greatest health risks are the least equipped with the technologies or resources to cope and create additional concerns during extreme weather events such as bushfires.**

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Disparities in energy-related hardship and technology ownership will have direct implications for energy equity and future climate resilience.

Energy-related hardship: young and disadvantaged hit hardest

Over one in three households (38%, n=1898) reported experiencing at least one form of energy-related hardship in the past 12 months.

SFL Q42. Multiple selections.

- The most commonly reported experiences included being unable to afford other essentials such as food or housing (15%, n=747) and being unable to pay electricity bills on time (13%, n=650) or not being able to afford to use heating when they needed it (9%, n=441).
- Smaller numbers of respondents had sought help from friends or family (8%, n=408), community organisations (8%, n=397), or had been on a hardship program (9%, n=424) to help pay their electricity bills.
- Notably, 6% (n=319) reported being at risk of disconnection, and 3% (n=158) had their electricity disconnected due to non-payment.

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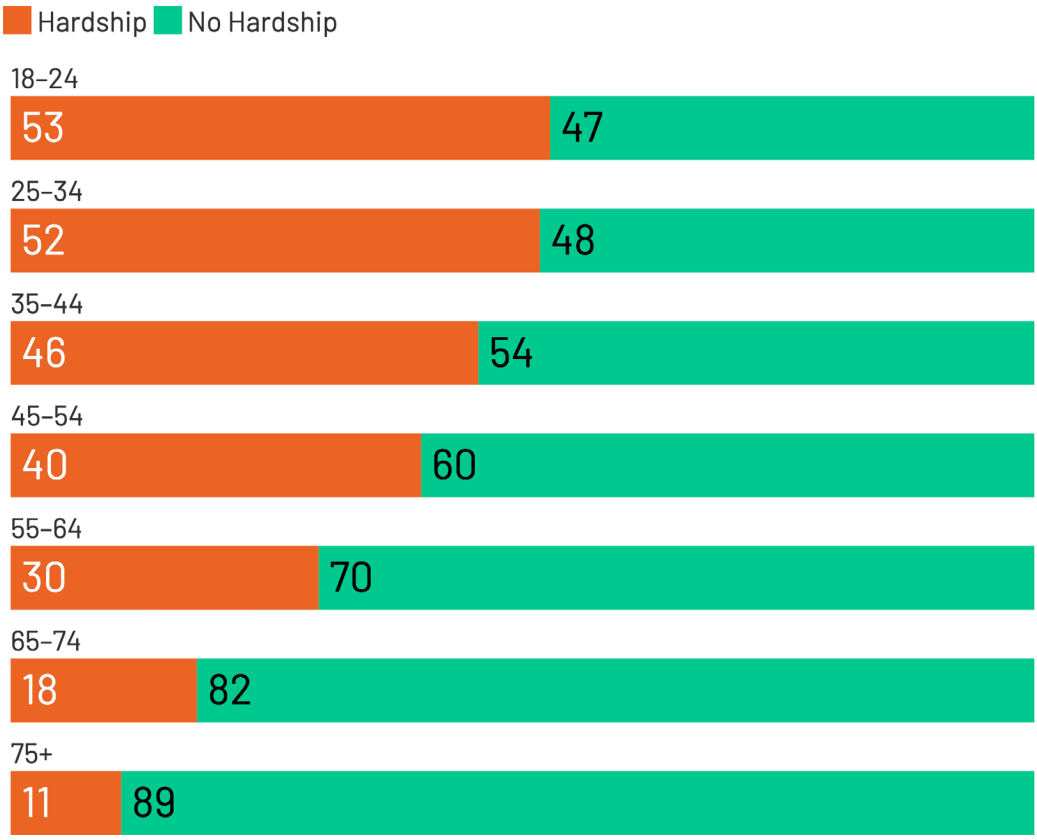
The likelihood of experiencing at least one of the above forms of energy-related hardship decreased as age increased.[1]



% that selected at least one form of energy-related hardship

- Younger adults were more likely than older adults to report experiencing an instance of energy-related hardship.
- Over half of those aged 18—24 (53%, n=330) and 25—34 (52%, n=449) had experienced an instance of energy-related hardship, compared with just 11% (n=41) of those aged 75 and over.
- The prevalence of hardship decreased steadily with age, with 18% (n=124) of those aged 65—74 and 30% (n=233) of those aged 55—64 reporting hardship.

1 The association between energy-related hardship and age group was statistically significant: $x^2(6, n = 5012) = 404.54$, $p < .001$. Moderate effect size, Cramer's V = .28.

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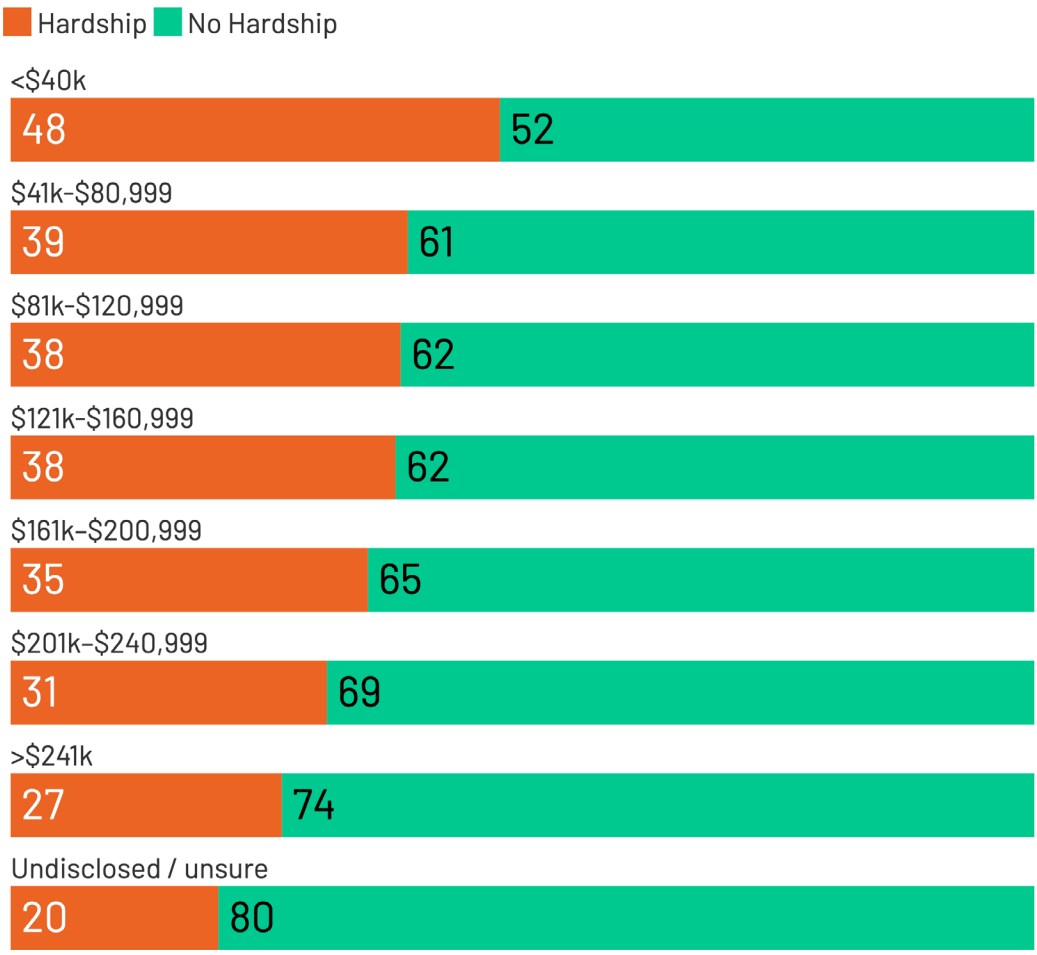
People with lower incomes were more likely to experience energy-related hardship than those with higher incomes.[2]



% that selected at least one form of energy-related hardship

- Experiencing energy-related hardship was highest among those earning less than $40k (48%, n=422) and decreased steadily as income increased, dropping to 27% (n=48) among those earning over $241k.

2 The association between energy-related hardship and income levels was statistically significant: $x^2(7, n = 5012) = 93.68, p < .001$. Small effect size, Cramer's V = .14.

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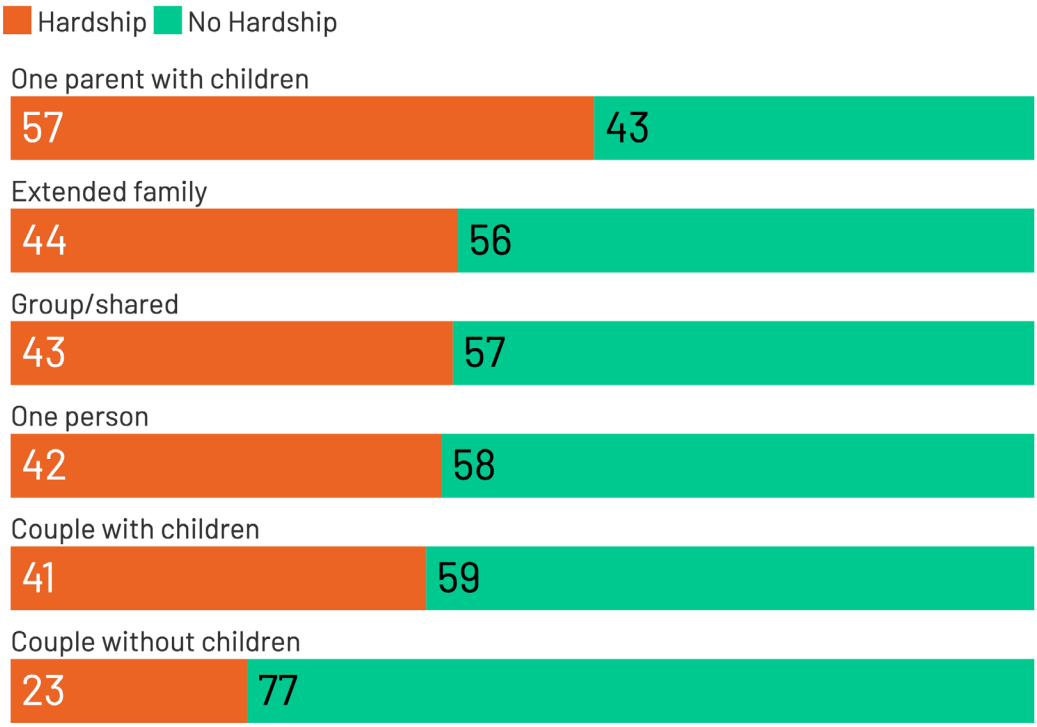
Household occupant characteristics were associated with energy-related hardship.[3]



% that selected at least one form of energy-related hardship

- One-parent households reported the highest rate (57%, n=247) of hardship, followed by extended families (44%, n=164) and group/shared households (43%, n=174).
- In contrast, couples without children reported the lowest level of hardship (23%, n=302).

3 The association between energy-related hardship and household occupant characteristics was statistically significant: $x^2(6, n = 4098) = 208.05$, $p < .001$. Small-to-moderate effect size.

Note: "Other" not included in analysis

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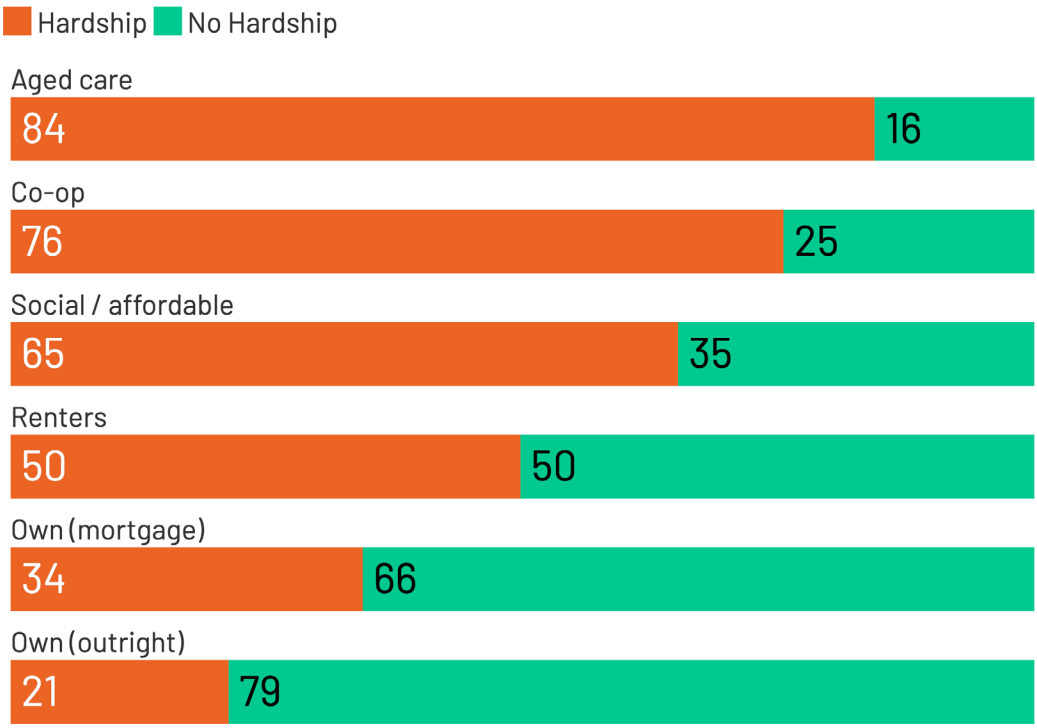
Housing tenure was strongly associated with the likelihood of experiencing some form of energy-related hardship.[4]



% that selected at least one form of energy-related hardship

- Hardship was lowest in outright homeowners (21%, n=314) but most prevalent among those in aged care (84%, n=27), cooperative (76%, n=37), and government-assisted housing (65%, n=129).
- Renters reported higher levels of energy-related hardship (50%, n=897) than households with a mortgage (34%, n=472).

4 The association between energy-related hardship and housing tenure was statistically significant: $x^2(6, n = 5012) = 413.56$, $p < .001$. Moderate effect size, Cramer's $V = .29$.

Note: "Other" not included in analysis

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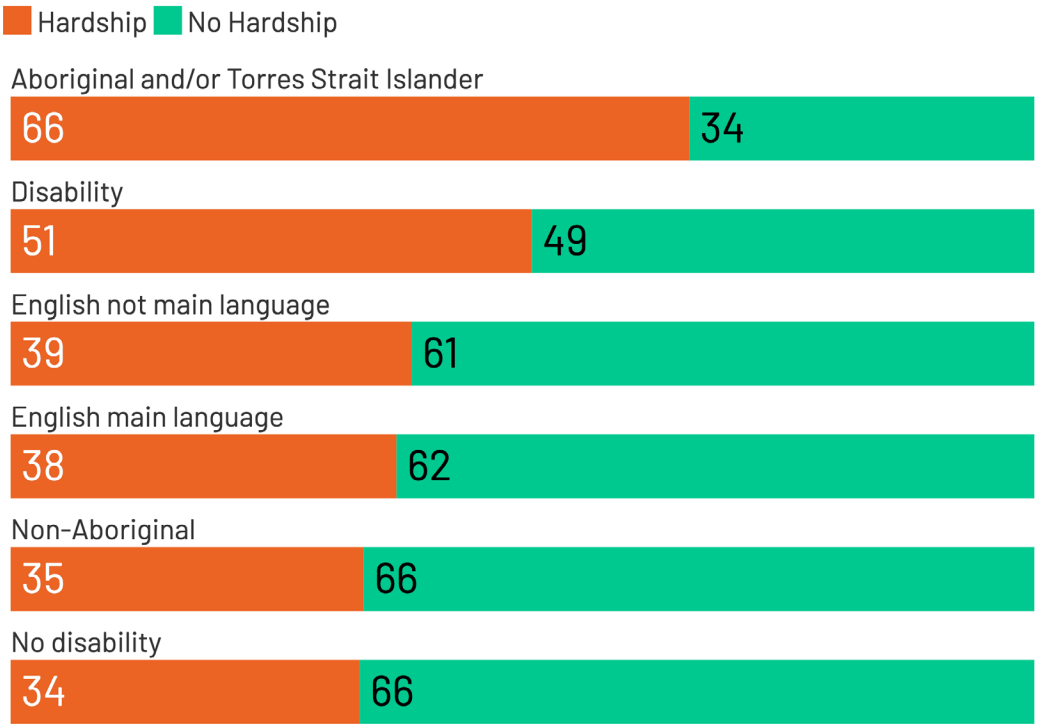
Equity group status was associated with marked differences in energy-related hardship. [5]



% that selected at least one form of energy-related hardship

- Aboriginal and/or Torres Strait Islander households reported nearly double the hardship rate (66%) compared to non-Aboriginal households (35%).
- Households where a member was living with a disability (22%, n=1113; no disability, 76%, n=3818; prefer not to say, 2%, n=82) had elevated rates of hardship (51%, n=566) compared with households without a member living with a disability (34%, n=1301).
- Households where English was not the main language (9%, n=441) had an almost identical rate of hardship (39%, n=173) compared with households where English was the main language (91%, n=4549; hardship: 38%, n=1715).

5 The association between energy-related hardship and disability status was statistically significant: $x^2(2, n = 5012) = 103.12$, $p < .001$. Small effect size, Cramer's V = .14. Results omit "prefer not to answer" responses

The association between energy-related hardship and English as the main language was not statistically significant: $x^2(2, n = 5012) = 0.49$, $p = .784$. Effect size, Cramer's V = .01. Results omit "prefer not to answer" responses

The association between energy-related hardship and Aboriginal and/or Torres Strait Islander status was statistically significant: $x^2(3, n = 5012) = 194.00$, $p < .001$. Small-to-moderate effect size, Cramer's V = .20. Results omit "prefer not to answer" and "don't know" responses.

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Energy hardship was heavily associated with the interaction of income and housing tenure, with renters dominating hardship at low and middle incomes and mortgaged households in higher income ranges.[6]

- At incomes below $80k, experiences of hardship were most prevalent among renters, with over half of hardship cases in these groups coming from rental households. Owners (both outright and with mortgage) reported far lower instances of hardship in comparison.
- Mortgaged households carried the largest share of hardship in the $160—240k range, suggesting that energy stress is linked to broader mortgage and housing cost stress from rising interest rates and energy-intensive lifestyles.
- In the $241k+ income group, a small number still reported hardship. However, this would likely be due to lifestyle or household-size factors rather than income or housing status alone.

6 The association between energy-related hardship, income group and housing tenure was statistically significant: $x^2(6, n = 5018) = 414.30$, $p < .001$. Moderate effect size, Cramer's V = .29.

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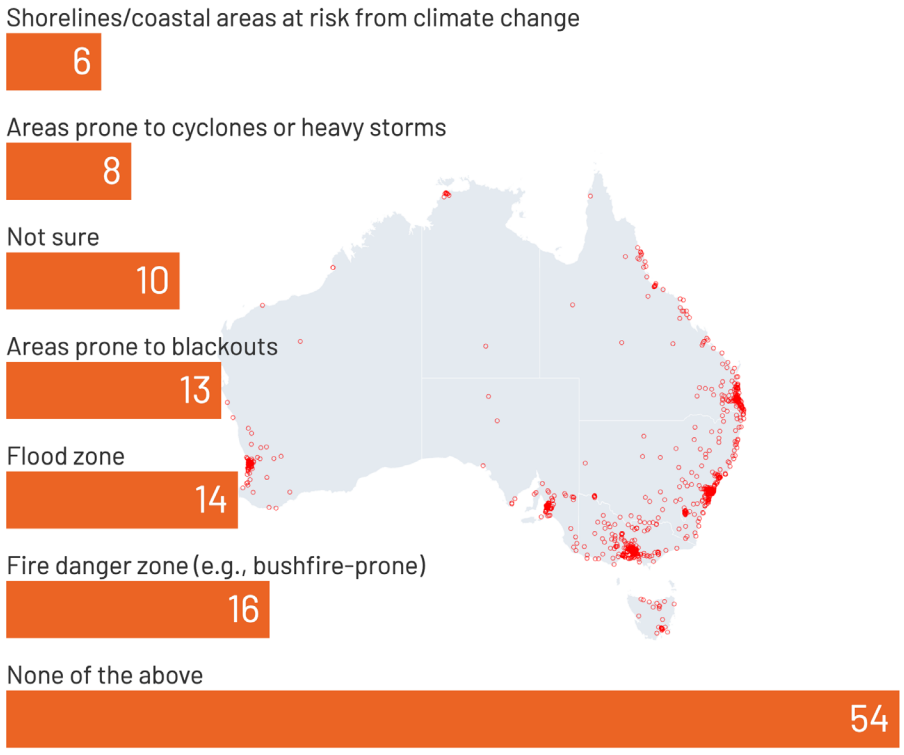
Climate risks deepen energy hardship

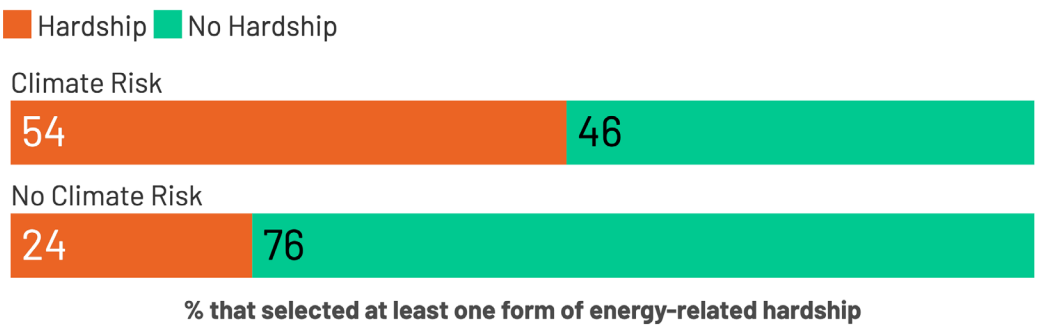
More than a third of households (36%, n=1804) identified their home as being located in an area that is vulnerable to at least one climate-related risk.

Households were asked if they lived in an area that is subject to at least one climate-related risk. The most commonly reported risks were bushfire-prone areas (16%, n=794), flood zones (14%, n=698), and areas prone to blackouts (13%, n=645). Smaller proportions lived in coastal areas at risk (6%, n=284) or cyclone/storm-prone regions (8%, n=375), while 10% (n=523) were unsure about their climate risk exposure.



SFL Q47. Note: the background image illustrates locations of households living in areas subject to a climate-related risk

We found that risks associated with energy-related hardship were compounded by self-reported climate risk vulnerabilities.



Among those respondents who reported their homes faced climate-related risk or were unsure (46%, n=2327), more than half (54%, n=1265) reported experiencing hardship. In contrast, of those not at risk (54%, n=2686), 24% (n=633) reported hardship.

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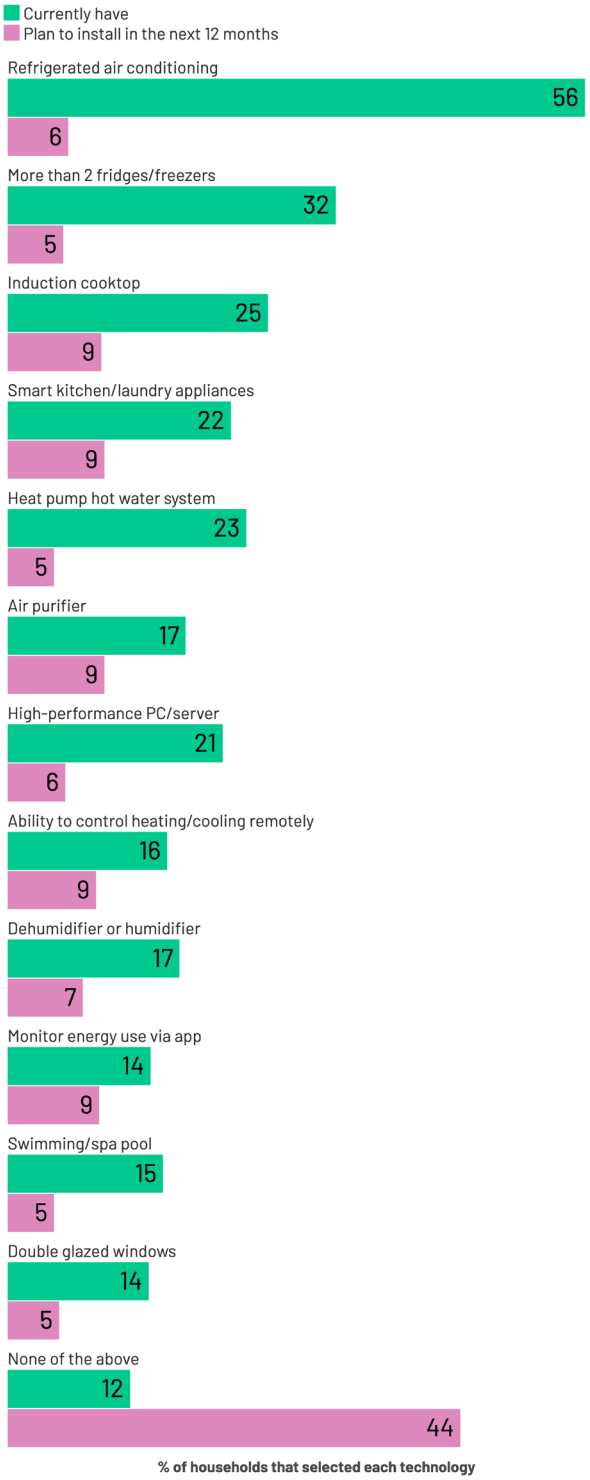
Twelve per cent of households reported having no current or emerging technologies from a list provided, highlighting that more than one in ten Australian households face limited opportunities to participate in demand response initiatives, reduce their energy demand, and improve their health and comfort outcomes.

Technologies in the home: 1 in 10 households left out

Households were asked about some current and emerging technologies that have been found in past projects to be significant in supporting better health and comfort outcomes, improving opportunities to participate in demand response programs, or helping households reduce their energy bills. The survey asked if households already had these technologies at their home and their intentions to purchase or install technologies in the coming 12 months.



SFL Q7&8. Multiple selections.

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- Current ownership of technologies such as induction cooktops (25%, n=1267), heat pump hot water systems (23%, n=1163), and energy monitoring apps (14%, n=696) pointed to uneven levels of digital and electrification readiness across households.
- Overall, the intention to install technologies in the next 12 months was modest, with no single item exceeding 10% planned ownership. Air purifiers (9%, n=470), smart appliances (9%, n=472), and induction cooktops (9%, n=454) were the most commonly selected technologies for future use.
- A substantial percentage (44%, n=2191) expressed no intention to install any of the technologies in the coming 12 months.
- While over half of respondents reported currently having refrigerated air conditioning (56%, n=2814), 44% (n=2199) did not, indicating a wide variation in access to home cooling.

Photo by Izumi Barton on Unsplash

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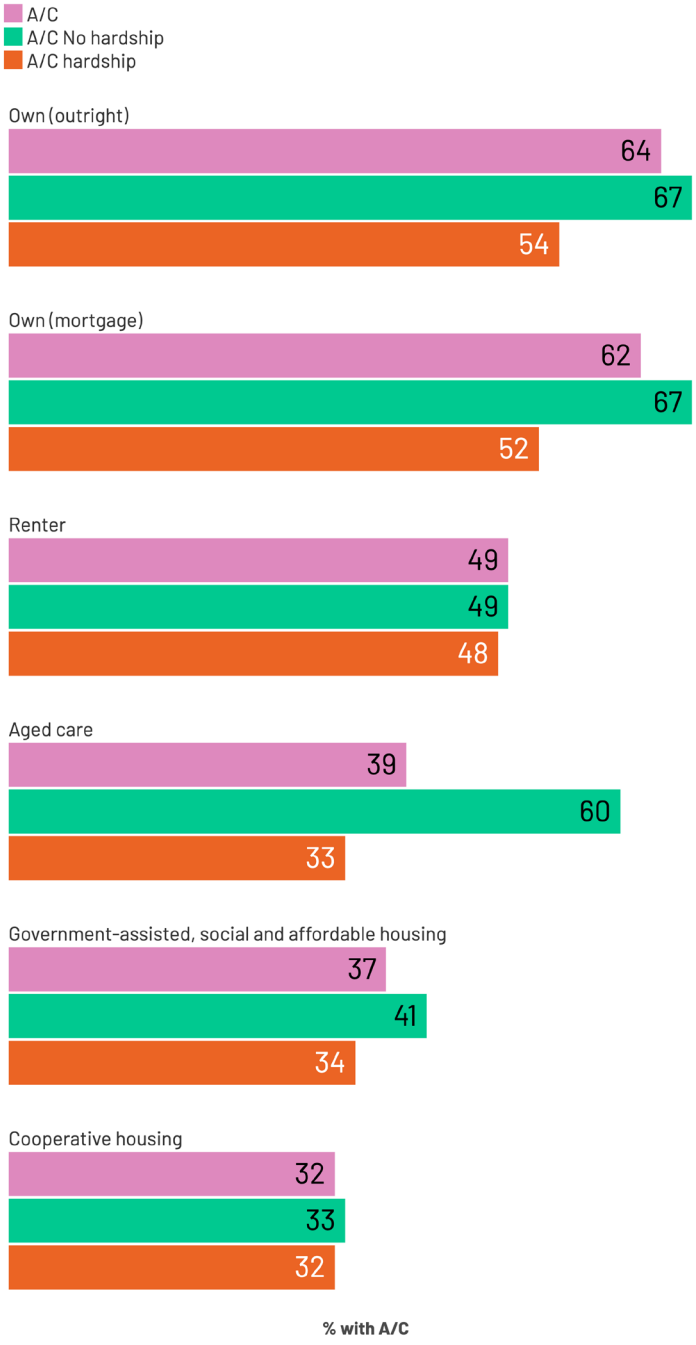
Keeping cool: air conditioning inequities in a hotter future

Unequal access to refrigerated air conditioning existed across different types of households. Households self-reporting hardship were less likely to have air conditioning than those not in hardship.

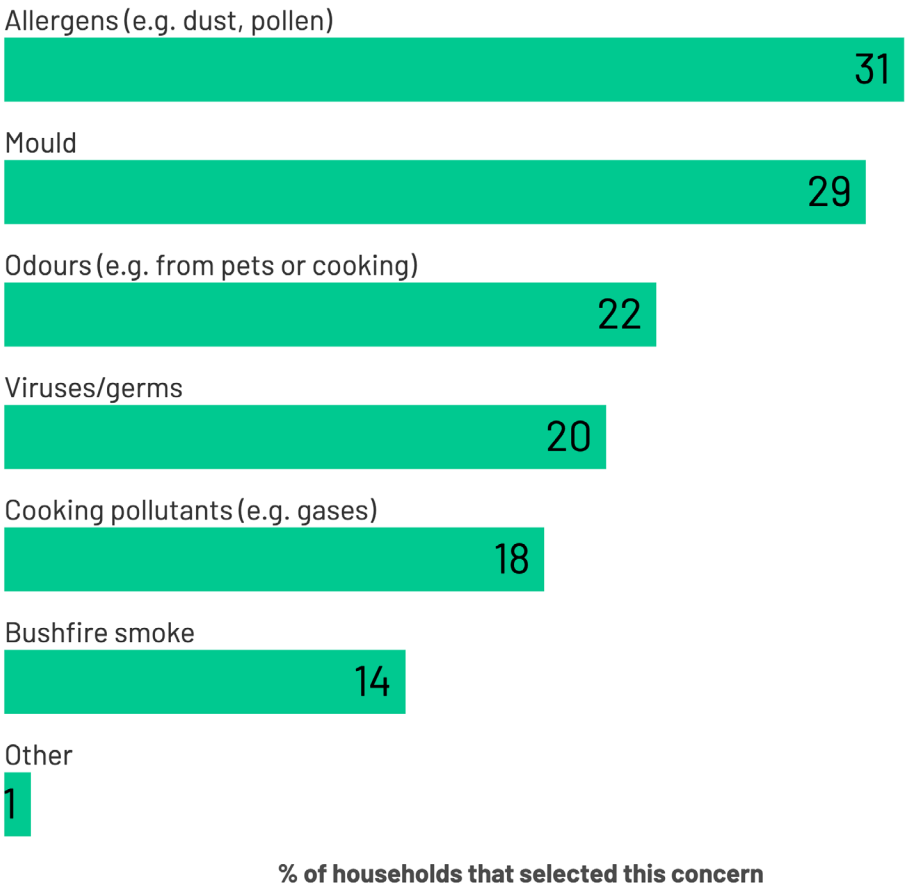


Base: Households that did not select refrigerated air conditioning in SFL Q7. Note: Households that selected "Other" for housing type (n=87) were excluded from the analysis

- A majority of renters (52%) and those in government-assisted, social, or affordable housing (64%) reported not having air conditioning, compared to 36% of outright homeowners and 38% of mortgage holders.
- The disparity was even more pronounced for residents in cooperative housing (68%) and aged care settings (61%), who did not have access to air conditioning.

Air quality: mixed concerns, natural ventilation preferred

Over half of all households (57%, n=2857) reported having concerns about the air inside their homes. Allergens and mould were the most pressing concerns among these households.



SFL Q25. Multiple selections.

- Allergens such as dust and pollen were the most frequently selected (31%, n=1530), closely followed by mould (29%, n=1466).
- Odours, whether from pets, cooking, or other sources, were also a concern (22%, n=1108).
- Health-related worries also featured, with 20% (n=1023) mentioning viruses or germs and 18% (n=917) citing cooking-related pollutants such as gases.
- Environmental factors, including bushfire smoke, were raised by 14% (n=682), while a small proportion (1%, n=47) mentioned other issues such as outdoor air pollution, chemical exposure, and pests.

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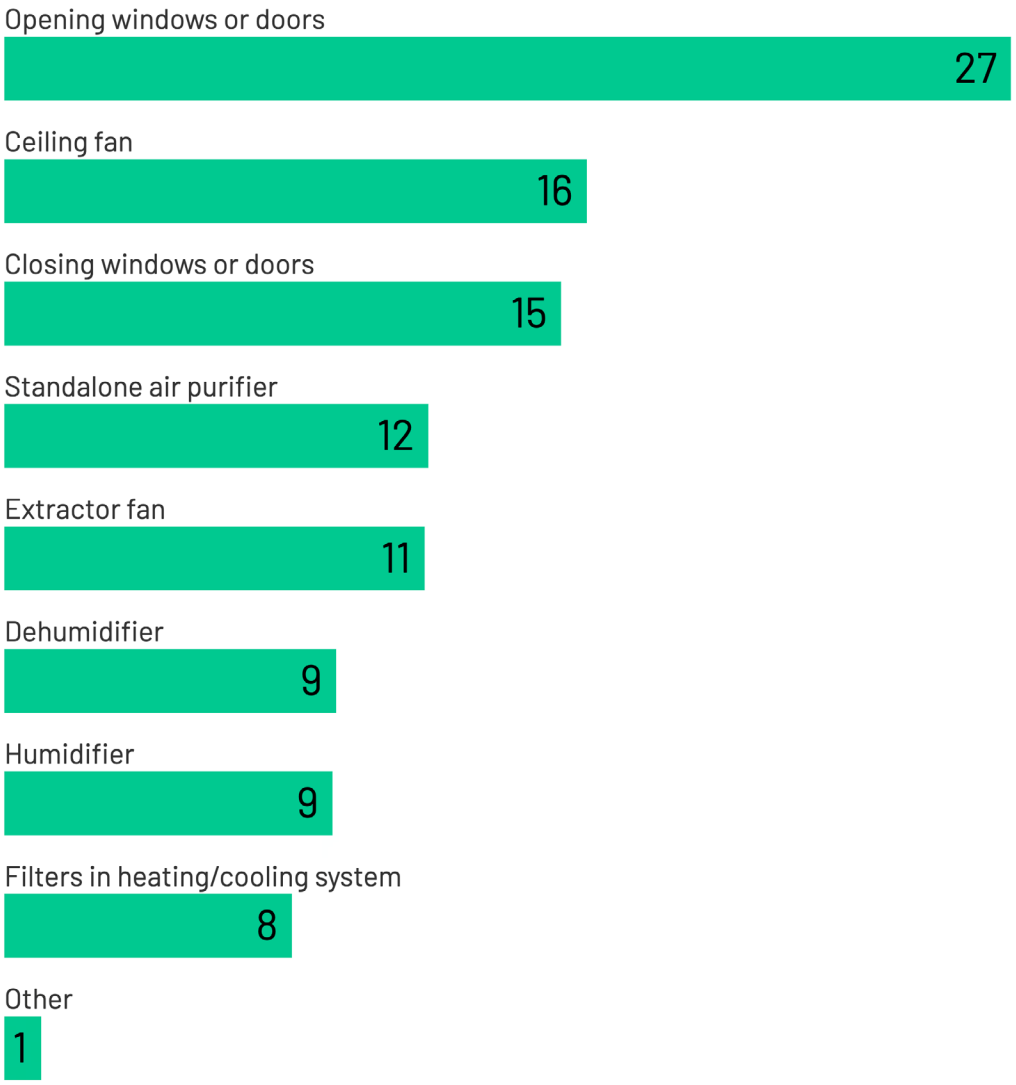
We asked households what they did to improve or control indoor air conditions. There was a strong preference for natural ventilation to improve or control indoor air conditions.



SFL Q27. Multiple selections. Base: Households that selected yes to managing air quality in their homes.

- The most common approach to improving or controlling indoor air conditions was opening windows or doors (27%, n=1370).
- Closing windows or doors was also selected (15%, n=757).
- Other popular methods included using ceiling fans (16%, n=792), standalone air purifiers (12%, n=576), and extractor fans (11%, n=571).
- Some households employed humidity control strategies, using dehumidifiers (9%, n=452) and humidifiers (9%, n=445).
- Filtration systems in heating or cooling systems were also selected (8%, n=393).

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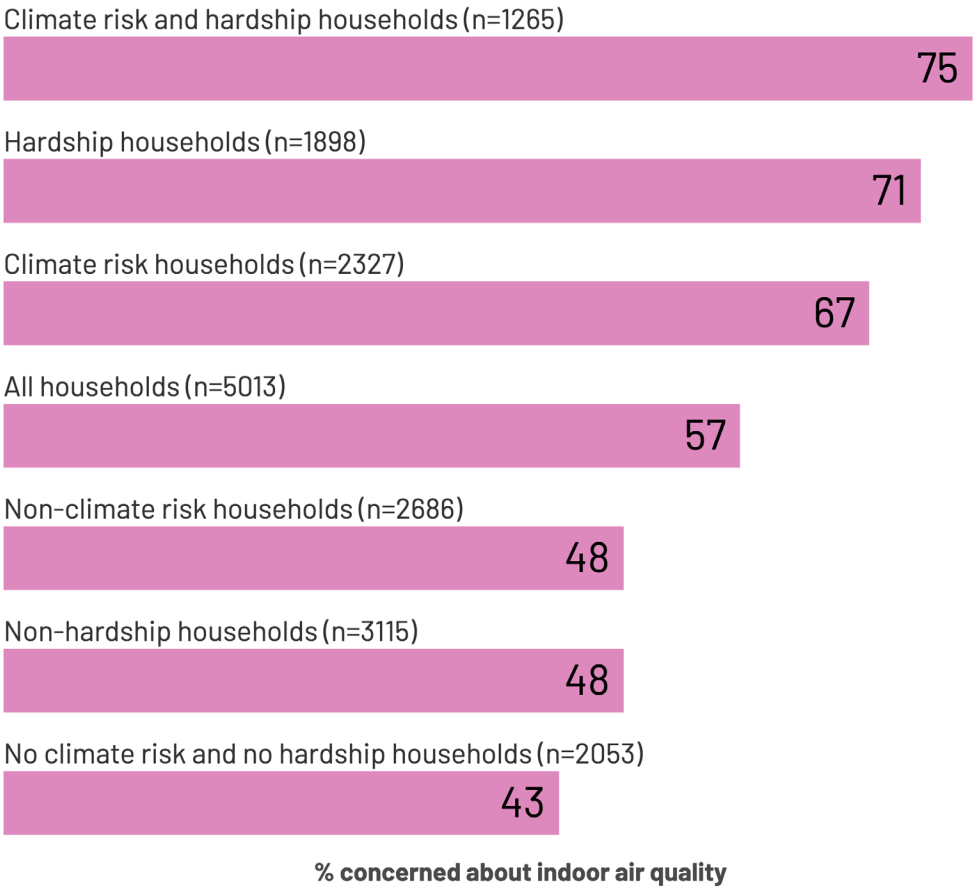
Households facing climate risks[7], hardship, or both were more concerned about air quality than those without these challenges.



7 The total accounts for households who were unsure whether their homes faced climate-related risks (n=523)

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Key implications: technology gaps, hardship, and climate resilience

In the context of intensifying climate pressures and a policy focus on electrification and demand flexibility, the results suggest a need for greater attention to accessibility, affordability, and the varying capacity of households to participate in the energy transition.

Over 1 in 3 households reported hardship; however, energy hardship is widespread and uneven.

- The highest rates of energy-related hardship were among young adults, low-income groups, renters and those in insecure housing, one-parent households, and Aboriginal and Torres Strait Islander households. However, hardship rates remained high across all income brackets, signalling that cost of living concerns are widely affecting households.
- The results show how energy hardship is heavily shaped by the interaction of income and housing tenure, affecting middle-income households just as much as low-income renters. At lower incomes, renters dominated hardship, reflecting well-known vulnerabilities around affordability, insecure housing, and limited ability to make energy efficiency improvements. At middle to higher incomes, however, hardship was not confined to renters, illustrating how energy stress can be linked to broader mortgage or housing cost stress.

Climate risks compound vulnerability.

- Households that reported living in an area vulnerable to bushfire, flood, or frequent blackouts were more than twice as likely to also experience energy-related hardship. While this data is self-reported, the correlation indicates at least a perception of compounding financial and climatic vulnerability that is likely to create challenges for adaptation and resilience.

Unequal access to thermal comfort technologies.

- Renters, social housing residents, cooperative housing, and aged care households were significantly less likely than homeowners to have refrigerated air conditioning, leaving them more exposed to heat-related risks. Structural barriers such as tenure insecurity, limited retrofit authority, and income constraints restrict access to solutions like insulation, double-glazing, or efficient cooling. Without intervention, access to healthy, safe and comfortable air will increasingly become a marker of inequality under changing climate conditions.

Over one in ten households lack key technologies that enable participation in demand response or electrification.

- Despite being widely known and available, only 14% of households reported having double-glazed windows and 23% a heat pump hot water system. Better incentives or subsidies are needed to expand access to energy-related technologies and services to ensure future grid stability and more equitable participation in the energy transition.

Air quality management is uneven.

- While half of households expressed concerns about indoor air quality (dust, mould, smoke, pollutants), many relied on simple, low-cost methods such as opening windows that may become less effective over time under changing climate conditions and emerging health concerns.
- The correlation between air quality concerns, climate risk and hardship indicates potentially heightened future vulnerabilities for households under climate change, which requires further investigation and intervention.

NEXT STEPS

The findings presented in this report are part of a longitudinal evidence base being developed and delivered as part of the Scenarios for Future Living project.

The intention is to run this national survey again in Q2 2026 and Q2 2027 to track these trends over time and to use these findings to inform the ethnographic research, scenarios, qualitative research, living labs, speculative designs, foresighting, and modelling and tool development being delivered across the project's seven work packages.

In turn, subsequent iterations of this survey will be informed by the research from other work packages and consultation with our partners and Industry Reference Group to ensure ongoing relevance and targeted findings which support the project's objectives.

Photo by Martin David on Unsplash

Scenarios for Future Living

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