



‘It’s a lifeline.’

A Long-Term Approach to Improving Home Energy Support Programs for Households Facing Vulnerability.

October 2023

Centre for Social Impact and Uniting Vic. Tas



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IMPACT**

Uniting

Acknowledgements

We acknowledge the Traditional Owners and Custodians of Country. We pay our respects to Elders past and present, to all First Nations Peoples, and to their lands, waters and cultures.

This project was conducted by the Centre for Social Impact, Swinburne University of Technology, in collaboration with Uniting Vic. Tas, CSIRO and GEER.

We acknowledge the consumers and staff of the Energy Efficiency Service, Uniting Vic Tas, and everyone who generously shared their time and experience to inform this research.

This project was funded by Energy Consumers Australia Limited (www.energyconsumersaustralia.com.au) as part of its grants process for consumer advocacy projects and research projects for the benefit of consumers of electricity and natural gas. The views expressed in this document do not necessarily reflect the views of Energy Consumers Australia.

Suggested citation

Wilson, E., Ambrose, M., Qian-Khoo, J., Bedggood, R., Rinnovasi, K., Cairns, M., Goncalves, J. & Maile, S. (2023). 'It's a lifeline': A long-term approach to improving home energy support programs for households facing vulnerability. Centre for Social Impact, Swinburne University of Technology: Hawthorn, Australia.

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Abbreviations

CSI	Centre for Social Impact
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSOT	Community Services Outcomes Tree
ECA	Energy Consumers Australia
GEER	Group of Energy Efficiency Researchers Australia

Executive Summary

Why the research was conducted

Energy Efficiency Services aim to support householders to better understand and manage their energy use and costs, including through changing energy use behaviour as well as maximising access to financial supports such as rebates, concessions, retrofit and appliance replacement schemes. There is a body of research that identifies their value in reducing household electricity use (by a median of 7.9% across programs), as well as contributing to ‘co-benefits’ such as increased health and wellbeing through increased thermal comfort and reduced stress (McAndrew et al., 2021).

Energy Efficiency Services, such as that offered by research partner Uniting Vic Tas, frequently work with vulnerable households and those experiencing energy hardship. Energy hardship manifests in a variety of ways including difficulty paying bills, energy rationing, and negative effects on health and other life areas. Rates of energy hardship are increasing in Australia and are particularly prevalent among those on the lowest incomes, as well as those on income support, people with a disability, and single parent households (Bryant et al., 2022).

In this context, this research investigates the outcomes achieved by an energy efficiency service and deepens understanding about the trajectory of energy hardship and the points of intervention to prevent and ameliorate it. The research provides design-insights into a suitable model for an energy efficiency service.

How the research was undertaken

The research drew on three datasets about households that utilised the Uniting Energy Efficiency Service:

1. household energy use and billing data for 847 households across three States (NSW, Victoria, and QLD) between 2018 and 2022, including data both before and after the Uniting Energy Efficiency Service intervention;
2. interview data from 40 households (NSW and Victoria)
3. survey data from the 40 interviewed households.

The energy use and billing data were analysed by a research partner at CSIRO. The interview and survey data were thematically analysed by researchers from the Centre for Social Impact and ‘journey maps’ were produced to capture the events and intervention points along the pathway of energy hardship that led to and went beyond engagement with the Uniting Energy Efficiency Service.

What the research found

Overall, households experienced a complex set of factors that contributed to their energy hardship. While the Uniting Energy Efficiency Service produced a range of energy, health and wellbeing outcomes, energy hardship often persisted due to a range of factors beyond the control of households.

Drivers of energy hardship

Interview data was analysed using ecological theory (Bronfenbrenner, 1994) to identify the factors contributing to energy hardship at the macro, meso and micro levels of the ecosystem. Macro factors, such as the poor quality of housing stock and low levels of income (particularly of income support), intersected with meso factors such as negative landlord and energy retailer behaviour, which in turn exacerbated individual and familial factors at the micro level, including poor health, disability, family circumstances and insecure employment. Together this set of factors meant that householders were unable to take the actions they identified as needed to manage energy to best support their health and

wellbeing and fit within their financial means. Despite this, householders were proactive in implementing energy efficiency behaviours but often utilised hyper rationing of energy to attempt to manage bills and debt. The majority of the 40 interviews highlighted repeated experiences of hardship, with individuals taking extreme measures to manage energy use while dealing with repeated and prolonged health, personal and financial crises and living in highly energy inefficient housing.

Types of support accessed

Householders sought support from a range of organisations, with some being familiar with government, community service and energy retailer supports (often through repeated use over many years), and others appreciating the linkage to these through the Uniting service or energy retailer (where this occurred).

Householders valued the multiple elements of support they received from the Uniting service, including analysis and explanation of bills and energy deals, advocacy to the energy retailer to solve issues and negotiate suitable payment plans, information about financial supports such as rebates and grants, energy efficiency tips, assistance in accessing retrofit or appliance replacement schemes, and referral to other services. This multi-element support is consistent with evidence on effective energy efficiency interventions at household level (McAndrew et al., 2021).

Energy retailers were most commonly the source of referral to the Uniting service. Householders had mixed experiences of support from their energy retailer. While negative comment outweighed positive, supports that were valued were well designed payment plans and proactive information and support to help access the financial assistance available.

A range of other supports were accessed, often via community organisations. These included government funded financial supports for energy, retrofits and appliance upgrades. Support to address other areas of hardship (physical and mental health, family violence, poverty etc.) were also accessed and valued. Many were familiar with these services and felt somewhat skilled at navigating them, while others felt shame and embarrassment which was overcome by the non-judgemental, tailored approach of the Uniting service.

What are the outcomes of support

A range of outcomes were experienced by householders who received support from the Uniting Energy Efficiency Service. The quantitative energy use data showed that between 56-61% of all households across the three States experienced reductions in energy use following the service, with a median change of between 4.4% and 7.6%, and the largest energy reductions being around 60 kWh per day. However, many households were already using less than the Australian average energy use of 15 kWh/day, including 35% of Victorian households. This suggests little room to reduce energy costs, with a better outcome being the capacity to increase energy use to healthy levels.

While acknowledging these constraints, householders reported increased knowledge of energy efficiency strategies from using the Uniting service and, in multiple cases, they continued to use these some years after the service. Householders also reported financial benefits through access to financial aid and debt relief which reduced their level of financial stress overall. Aligned with this was increased confidence in dealing with energy retailers and understanding billing. Significant psychosocial benefits accrued from support to deal with bills and energy problems, including reduced stress and avoidance of contributing to other mental health or health conditions. Given the cascading issues constructing hardship in their lives, many saw the support as a 'lifeline'.

Implications for making support more effective

Householders offered suggestions for change at the macro and meso levels of the ecosystem, as they could clearly see that their energy hardship resulted from these factors. Consistent with other research

about energy hardship in Australia (Bryant et al., 2022), householders discussed the need for a wide range of activities to:

- increase incomes.
- reduce energy prices.
- reduce debt/ support bill payment.
- make housing more energy efficient.
- make household energy use more efficient.

Overall, householders sought mechanisms that would better embed or automate provision of the cheapest available energy offer and associated concessions, rebates and grants. At present, the system is too complex with multiple sources of support and financial aid whereas energy retailers are well placed to connect consumers to these supports in a reliable and regular manner. While these sources of financial aid were welcome, householders also explained the difficulties in reducing high levels of debt, with some calling for debt waivers.

A major focus of householders for reform was the area of housing quality and the implementation of requirements for landlords, public and private, to increase the energy efficiency of their housing stock. However, in the absence of this, more financial support to tenants and householders to make their own upgrades is needed.

In this context, the Uniting Energy Efficiency Service was highly valued by the majority of householders. The non-judgemental and 'genuine' approach of staff put householders at ease, as did the assurances from staff that they would ensure that bills and options were fully understood, and that further support was available if needed. The information resources supplied, including energy efficiency materials and information on services, were useful but householders felt more resources would be beneficial. In particular, householders wanted more regular check-in or follow up and a mechanism to extend the service to other energy consumers.

Given that the Uniting Energy Efficiency Service is largely working with households already experiencing some level of energy and/or debt crisis, the focus of the service, then, is necessarily hardship, of which energy access and use is a primary concern but where energy hardship is understood to be constructed by a wide variety of factors. This highlights the important role of the service to support households to deal with this range of issues including tenancy matters, access to quality housing, access to appropriate income support, and psychosocial and health support, among others. Because these are contributing factors to energy hardship, unless they are addressed, energy hardship is likely to continue.

With this set of roles, the Uniting Energy Efficiency Service can be seen as both a 'front door' and navigation partner to a wide range of further supports, and as an advocate and influencer for householders across the ecosystem. To achieve this, the service may need to expand its reach to and follow up with households, as well as its focus on related services and supports such as tenancy rights and housing access. Finally, energy efficiency services have a crucial role to advocate for consumers to government and energy retailers, to highlight the systemic factors maintaining energy hardship.

Introduction

Research overview

This research aims to examine the impacts of home energy support services provided by community-based organisations such as Uniting Vic Tas, a project partner. The project involves analysis of energy use and billing data (pre and post service engagement) for households participating in the Uniting Energy Efficiency Service between 2018 and 2022 in three States: Victoria, NSW and Queensland. In addition, the project draws on the experiences of service users through interviews with a sample of 40 householders, and the development of Journey Maps to better elucidate the factors influencing the 'journey' or pathway of energy hardship, and what households did to try and address this issue. The investigation explores the benefits of home energy support programs and highlights areas where supports could be provided or re-designed for greater effect.

Background

Many homes in Australia provide little thermal comfort and these homes are mostly occupied by people who are least able to afford to improve them, such as renters and low-income homeowners (Bryant et al., 2022). The impact on households who are unable to use sufficient energy in the home can be profound. Recent findings suggest that health is a critical issue for many people who are living in sub-standard conditions. With residents more likely to die from cold than heat (Gasparrini et al., 2015) and reporting that they are too cold or too hot at home (Bedggood et al., 2018; Russell-Bennett et al., 2017), both health and wellbeing are unnecessarily compromised. In addition, people are stressed about energy bills, struggle with 'control' (agency) and are living in sub-comfortable conditions (Bedggood et al., 2018). This set of circumstances are part of the experience of what has been termed 'energy stress', 'energy hardship' or 'energy poverty', which manifests as inability to pay energy bills (sometimes resulting in energy disconnection), debt difficulty, energy rationing resulting in negative impacts on health and social conditions, and reduced spending – often resulting in deprivation – in other life areas, including food and medicine (Bryant et al., 2022).

A recent study of Australian households, using multiple indices of energy stress, found that rates of energy stress had risen since 2008, and in 2020 sat at 20% of all households, and almost half (48%) of households in the lowest 20% of income. Among those on income support, energy stress was experienced by 51% of those receiving Disability Support Pensions (DSP) in 2017 and 57% of households receiving Newstart/JobSeeker income support payments in 2019 (Bryant et al., 2022). A range of research points to the multiple factors that result in poorer households experiencing higher levels of energy stress. This includes the higher incidence of these households being in energy inefficient homes (ABS, 2012), of paying higher rates for energy (Colmar Brunton, 2018; Bryant et al., 2022), and of having higher energy use requirements related to disability or illness (Bryant, et al., 2022). Households with at least one member with a disability or chronic health condition were almost twice as likely to experience energy stress than those with members with no condition (Bryant et al., 2022). Renters, particularly those in public/social housing, have high rates of energy stress with 35% experiencing it in 2020 (though this figure reflects a reduction on previous levels due to temporary income support and COVID supplement increases) (Bryant et al., 2022). Energy stress results in almost 1 in 10 households going without heating in 2019-2020 or 16% of those on JobSeeker and 14% of those receiving DSP (Bryant et al., 2022). While those households reliant on income support are more likely to experience energy stress, those employed part time and/or on low wages also experience high rates of energy stress (25-40%) but may be ineligible for concessions to alleviate it (Bryant et al., 2022). Twenty-six percent (26%) of single parent households experienced energy stress in 2020 (Bryant et al., 2022).

Households struggling with energy stress benefit from home energy support. Many community services like Uniting Vic Tas (Uniting) provide home energy assistance to households struggling to pay energy bills and facing energy poverty in order to help them use energy in their homes safely and effectively.

Organisations provide this support by contacting households and working with residents to help them understand bills; learn how to advocate on their own behalf with retailers; know how to reduce energy bills and access concessions, rebates, retrofit or appliance replacement schemes; as well as providing referrals to other services. Understanding the outcomes or benefits of these services and the factors influencing the extent and longevity of benefits is essential to improve future efforts.

However, energy efficiency interventions are diverse and operate in complex environments affecting households. As a result, it is difficult to assess their outcomes and the factors and intervention components that determine these. In this complex environment, McAndrew et al. (2021, p.1) argue that:

there is still a lack of evidence on the types of household energy efficiency interventions that are most effective for conserving or optimising energy, improving household health, well-being, and financial state, while accounting for the complexity and multiplicity of domestic energy use practices.

Aim of the research

Uniting has been providing energy assistance in Victoria, NSW, and Queensland for over 20 years. The aim of the project is to assist Uniting, and the sector more broadly, in designing energy support programs for households facing vulnerability and hardship in future. To achieve this, the study investigates the benefits and gaps of the Uniting Energy Support Service to determine ‘what works’ with households, and what actions are needed to address the drivers and effects of energy hardship.

We expect that the results that inform Uniting’s future energy support programs will also benefit other advocacy and service organisations. The project’s findings provide evidence to help determine the outcomes of the current energy efficiency service, and the activities and ingredients of service delivery that support these. The gaps identified in this research will support the development of new and improved ways of supporting households facing energy vulnerability.

The project focuses on three key questions:

1. Is the assistance provided effective in producing the expected outcomes of lower bills, improved energy management and higher confidence to engage with energy retailers?
2. Are there any other benefits of the provision of assistance?
3. In what ways can energy hardship be best supported/ameliorated?

The project involves a collaboration between researchers from the Centre for Social Impact (CSI, Swinburne University), the CSIRO, and service providers and policy advocates from Uniting.

Household Energy Efficiency Programs

In 2021 a systematic literature review of 160 research papers published between 1990 and 2019, summarized evidence about the effectiveness of household-level energy efficiency interventions, including 27 studies from Australia (McAndrew et al., 2021). This review is a useful capture of both intervention design and outcomes from these programs and is summarized here as a means of succinctly capturing the current state of evidence about these programs.

Interventions were found to comprise a range of activities including:

- Workshops and training
- Digital technology including web apps.
- Information and education
- Retrofits to the building
- Home energy audits
- In-home displays, smart meters
- Pricing strategies – tariffs and rewards
- Policy changes (McAndrew et al., 2021).

Behaviour change interventions have largely centred on provision of information and feedback to address assumed knowledge gaps about efficient energy use. Such interventions have included: a focus on goal setting and strategies to ‘problem solve’ energy use; financial incentives; and motivation through referencing of social norms (McAndrew et al., 2021).

The evidence of effectiveness and program design

Energy efficiency programs are broadly understood to encompass multiple outcomes including efficient use of energy as well as financial and wellbeing outcomes for individuals and households. As defined by Butler et al. (2016):

energy efficiency is using energy wisely and economically to sustain everyday life, live comfortably and support wellbeing (Butler et al., 2016, p. 152 quoted in McAndrew et al., 2021, p.1).

McAndrew and colleagues’ (2021) review found that outcomes of energy efficiency interventions for households included energy use and bill reduction, increased energy security, improved health including reduced hospitalization and temperature related deaths, increased economic productivity, and reduced financial stress. Additionally, outcomes included improved comfort through using more energy or uptake of renewable energy (with no reduction in energy use). The focus on non-energy benefits or ‘co-benefits’ including knowledge, empowerment, confidence, positive attitude, and stress is also a finding of Bedggood et al.’s (2018) Australian study of low income households receiving energy efficiency interventions.

Of the 153 studies of household interventions reviewed by McAndrew et al. (2021), 133 of these reported a positive impact. Most (100) interventions focused on electricity reduction with a median reduction outcome of 7.9% across studies. Most programs utilized only one intervention activity type with few combining multiple elements, whereas the inclusion of multiple activities in interventions was correlated with higher outcomes in relation to energy reduction (McAndrew et al., 2021).

Information-based interventions were the most prevalent across studies, thus accounting for a substantial portion of outcomes. This is consistent with a review of a recent Low Income Energy Efficiency Program (LIEEP) that found that information provision was effective particularly when tailored and delivered from a trusted source (Energy Consumers Australia, 2020). Despite being the most

prevalent type of intervention across studies, the longevity of outcomes from information-based programs has been found to be not sustained (Bird and Legault, 2018 cited by McAndrew et al., 2021).

McAndrew and colleagues (2021) provide concluding advice for the design of energy efficiency programs based on their study findings:

Interventions in energy efficiency need to be designed to take account of the multiplicity of outcomes and broaden their goals to encompass household well-being. Our findings illustrate that a multi-activity approach reported more success than single activities. ... Other measures of success also need to be clearly articulated and measured, such as improved household health and well-being, thermal comfort, air quality, increased productivity, energy security and improved social capital (p.8).

Finally, the dominant focusing of household energy efficiency programs at the level of the individual consumer/household fails to account for the macro environment which shapes, even controls, the factors affecting energy use. To address this, programs should be 'multi-level' as well as 'multi-component' in activity (McAndrew et al., 2021). This is consistent with other studies that question the capacity of behavioural intervention in a context where household energy use is the net result of many factors:

... the type of dwelling itself, and the family type occupying that dwelling, could influence the effectiveness of such projects. For example, older homes built before any energy efficiency standards were introduced will consume more energy ... Those living in rental properties ... invariably occupy older, inefficient homes, which have less efficient appliances. Thus, behaviour change programs are important, but must be considered in light of the limitations of the characteristics of the dwelling itself, and the limitations of what tenants can change in those homes (Perenyi et al., 2019, pp.2-3).

This commentary highlights both the diversity of activities that should be included in household energy efficiency programs as well as the multiplicity of outcomes. These findings are an important frame for this study, and for the Uniting Energy Efficiency Service it assesses.

The Uniting Energy Efficiency Service

The Uniting Energy Efficiency Service has been in operation for over twenty years and currently provides a service to householders in Victoria, NSW, QLD and South Australia, with a service user base of around 80 customers per month from each participating energy retailer. There are three main referral sources of households to the Uniting service:

- Energy retailers.
- Community Organisations (financial counselling, Emergency Relief, etc.).
- Other businesses (i.e., distributors).

Following service provision by Uniting to a household, energy retailers can re-refer their clients which occurs typically after 6 months.

The Uniting service is funded largely as a single touch point (either face to face in the service user's home or over the phone), though some service users receive multiple touch points, and follow up with all service users is a routine part of the service. Following the advent of COVID-19, all service delivery switched to phone-based which resulted in increased access to regional and remote households (as face-to-face services to these areas was costly and therefore previously limited).

The Uniting Energy Efficiency Service delivers support through the following activities:

- Helping service users to understand the level of energy use in their home.
- Helping to manage energy use through behaviour change strategies or, in some instances, through support to access retrofit programs (where available), i.e., to replace high consumption equipment (such as refrigerators) with more efficient items.

- Helping to find the best energy plan.
- Helping to link to or apply for available concessions and grants.
- Helping to negotiate with energy retailers, often via a conference call with the energy retailer and customer (which is of particular help to customers with language barriers).
- Referral to other relevant services, such as Emergency Relief, food banks etc.

Support is tailored to the needs of the household and each instance of service is unique. For example, some service users do not struggle with their energy usage however need help applying for grants/concessions whereas other service users have adequately accessed financial support but are struggling with their energy use. While the service is offered across multiple States of Australia, the service design remains relatively constant. Levels of hardship appear relatively consistent across States, despite different energy policies regulating energy retailers and the levels of support they are required to offer customers experiencing hardship.

The program design of the Uniting Energy Efficiency Service is captured in a Theory of Change developed by Uniting (Figure 1).

Note: the figure includes a range of service program areas. The Energy Efficiency Program is denoted by pink font and boxes.

Energy Efficiency Program Theory of Change

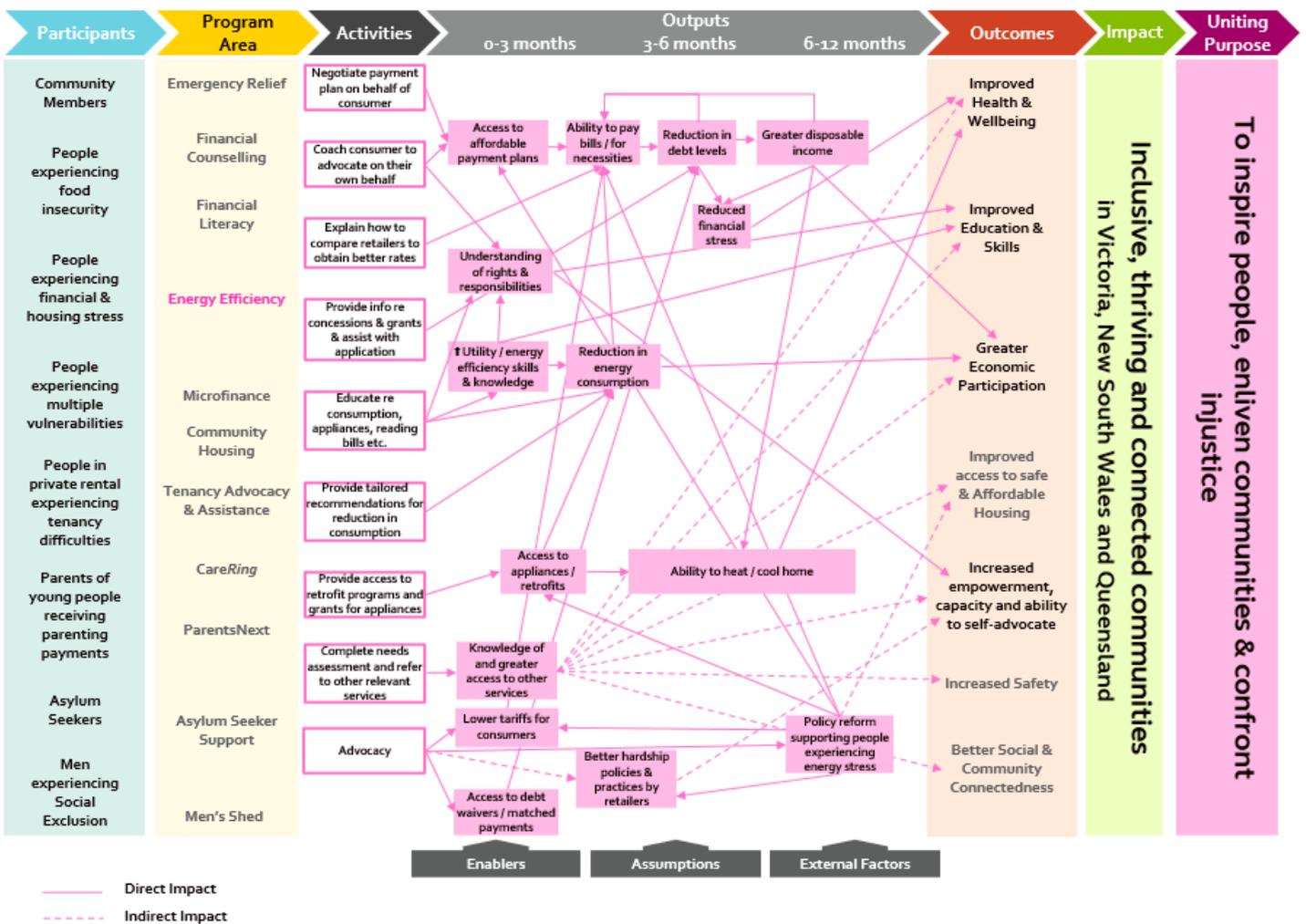


Figure 1. Theory of Change for Uniting Energy Efficiency Service

Research Methods

Research Design

To determine the impacts, benefits, and gaps of energy support programs with a view to using the insights to improve such programs, a mixed-methods, quasi-experimental approach was used involving the collection of both quantitative and qualitative data.

Three data sets were utilized:

1. Household energy use data provided by the energy retailer for a large sample of households across three States;
2. Interview data from householders who had received the Uniting Energy Efficiency Service;
3. Survey data from householders who participated in interviews (point 2 above).

Each of these data sources and methods of data collection and analysis are explained below.

The project obtained ethics approval from Swinburne University Human Research Ethics Committee.

Methods

1. Household Energy Use Data

1.1. Data sampling and collection

A key objective of the project was to examine energy data both pre and post the date of provision of the Uniting Energy Efficiency Service (the intervention) for each household. Intervention dates occurred both pre and post the COVID lockdown date of 1st March 2020, so the sample was segmented into households receiving a service before COVID or during COVID.

Household energy consumption data was collected via a participating large energy retailer for households identified by Uniting as previously receiving support from the Energy Efficiency Service. Researchers aimed to access 24 months of energy use data as follows:

- NSW: 300-500 households: energy use data 12 months pre- and 12 months post-Uniting Energy Efficiency Service visit/call
- VIC: 300-500 households: energy use data 12 months pre- and 12 months post- Uniting Energy Efficiency Service visit/call
- QLD: 300-500 households: energy use data 12 months pre- and 12 months post- Uniting Energy Efficiency Service visit/call.

The consent to provide energy use data had already been provided by households as part of the Uniting Energy Efficiency Service. Retailers/distributors had obtained this consent previously in order to refer the household to Uniting for assistance. Researchers extended the period of this data so it covered two years (where practical and possible) and received the data in a de-identified format from the energy retailer. A waiver of consent was approved by Swinburne Human Research Ethics Committee for this extension of data.

The final sample consisted of energy consumption data for:

- 415 homes in NSW,
- 201 homes in Victoria, and
- 231 homes in Queensland.

Most of the data was from 2019-2021 (Table 1). The participating energy retailer generally only retains energy data for three years, so data pre 2019 was not widely available.

Table 1. Energy data by years

Year	NSW	QLD	VIC
2018	0.20%	0.08%	0.33%
2019	28.27%	49.70%	39.52%
2020	27.18%	25.58%	33.61%
2021	33.99%	19.18%	22.41%
2022	10.37%	5.46%	4.14%

The meter reading date was used to establish whether the energy data was pre or post the intervention date. In NSW and Queensland, because the energy data covers multiple days, some of the days covered may straddle the intervention date. In this case, this data was assumed to be post intervention data as the meter reading date occurred at the end of the data period.

Table 2 shows the energy data distribution for these various cohorts within each State.

Table 2. Energy data pre/post COVID and pre/post intervention

State	Pre COVID		During COVID		Total
	Pre-Intervention	Post-Intervention	Pre-Intervention	Post-Intervention	
NSW	14.20%	23.29%	34.98%	27.53%	100%
QLD	21.54%	37.43%	23.40%	17.62%	100%
VIC	18.14%	25.62%	32.74%	23.51%	100%

Energy data provided covered both energy consumption in kilowatt hours (kWh) and energy cost in dollars. The energy cost data covered both peak and off-peak energy costs as well as any concessions and discounts that households were entitled to. The supply charge was also listed separately. No tariff information was provided.

1.2. Data Analysis

A researcher from the CSIRO undertook analysis of energy use and billing data. To compare the data between the cohorts listed in Table 2, daily consumption values were calculated. For Victorian data, nearly all the data was daily smart meter data so an energy consumption value for each day was provided as part of the data set. For NSW and Queensland data, an average was calculated by dividing the energy consumption value by the number of days covered by that data. In both States, meter readings were less frequent and consequently covered a longer period. In NSW, the average number of days covered by each energy data point was 35 days, while in Queensland it was 36 days.

A small number of homes had solar photovoltaic (PV) panels installed to generate electricity. 9.5% in Victoria, 4% in NSW, and only 1.3% in Queensland. Meter consumption data from houses that have PV systems installed will often only be the net value, that is, the energy imported from the grid. Any energy obtained from the PV array and used within the house is not included and consequently the actual total energy consumption value for that house is unknown. Consequently, those houses that had PV systems installed were excluded from the main energy consumption data analysis but included in the billing cost analysis.

A subset of 40 households were selected for detailed interview as part of this study. These households were in NSW and Victoria only and were selected based on homes with best available energy consumption data within each of the four cohorts listed in Table 2. The objective was to have an even distribution between the cohorts, i.e., 10 households in each. Table 3 lists the split achieved. Four of the houses in Victoria have PV systems installed and for the analysis of these interview households, these homes were included. Additional analysis was undertaken to ensure that homes with PV were not causing bias with the results.

Table 3. Count of interview households

Group	No PV	Have PV	Total
NSW Pre COVID Intervention	11	0	11
NSW During COVID Intervention	11	0	11
VIC Pre COVID Intervention	5	2	7
VIC During COVID Intervention	9	2	11

All data was de-identified prior to full analysis after the subset of 40 households had provided consent to participate in interviews (described below). Multivariate data analysis was used to identify changes in energy use (and bills). Since data was de-identified, analysis of other variables was not possible (such as household characteristics or dwelling features).

The base threshold energy levels were used as a threshold indicator to delineate between households increasing energy use for their wellbeing (likely low energy use base) with households using less energy. Energy use comparisons were also made to average Australian daily energy use.

2. Interview data from householders who had received the Uniting Energy Efficiency Service

2.1. Data sampling and collection

Researchers from the Centre for Social Impact conducted in-depth, qualitative interviews. Forty (40) households were interviewed from NSW and Victoria to capture the household situation and experiences in regard to energy hardship and vulnerability. The sampling strategy originally aimed for:

- NSW - 20 households: 10 who received assistance in person and 10 who received assistance by phone (noting that some participants will have received support via the phone before and during COVID-19).
- VIC – 20 households: 10 who received assistance in person and 10 who received assistance by phone (noting that some participants will have received support via the phone before and during COVID-19).

A list of households with best available energy consumption data within each of the four cohorts listed in Table 2 above was generated from the analysis of energy data. Using the contact details already obtained by Uniting as part of service delivery, Uniting staff contacted those on the list via phone or other contact method. To invite potential participants to interview, a Uniting staff member called households from each cohort starting at the top of the list (best energy data to minimal accepted energy data) and worked their way down. A phone number was called up to 3 times (if was not answered) over a week, and if no response (or the number was disconnected), the next household on the list was contacted. Contacts of households who were interested in participating were then passed on to the CSI team (with consent from these households). A CSI researcher contacted households in a follow-up call to make an appointment for the interview and sent a text message reminder on the day prior to the interview.

Household recruitment and interviews commenced from the second half of October 2022 and were completed in early December 2022. The Uniting team contacted a total of 226 households across the two States. As shown in Table 4 below, on average one in two (56%) households responded to the phone calls. Of those who responded, approximately half agreed to participate initially. The CSI team followed up with 60 households and conducted 40 interviews.

Across the sample, the two pre-COVID groups were the most difficult to reach and the Uniting team had to contact 69 households in VIC and 70 in NSW to meet the target of 10 households in each State. Only one in five contacted households from these two groups agreed to participate initially and of these (28)

10 ended up withdrawing. Finally, a total of 18 households who received supports from Uniting in the pre-COVID period were interviewed.

On the other hand, the two during-COVID groups saw higher response rates, especially in Victoria. Of these two groups, approximately one in three contacted households agreed to participate initially (among which 10 withdrew). Finally, a total of 22 households who received supports from Uniting in the during-COVID period were interviewed.

Table 4. Household Interviews Overview

	# Households called (A)	# Households responded (B)	% Reach (B/A)	# Households initially interested (C)	% Initial positive responses (C/A)	# Participants withdrawn	# Interviews completed
VIC-Pre	69	31	45%	13	19%	6	7
VIC-During	37	25	68%	16	43%	5	11
NSW-Pre	70	39	56%	15	21%	4	11
NSW-During	50	28	56%	16	32%	5	11
	<i>Sum</i>	<i>Sum</i>	<i>Ave</i>	<i>Sum</i>	<i>Ave</i>	<i>Sum</i>	<i>Sum</i>
	226	123	56%	60	29%	20	40

Reasons for no or low response rates appear likely to include:

- the late time of year (Oct-Dec) where other demands might place a higher priority on time,
- other priorities at the time (many cited ‘commitment constraints’ according to the Uniting staff),
- not recalling the service received from Uniting (which would have been 1-4 years ago in some cases),
- reluctance to give feedback to Uniting,
- change-of-mind/cancellation.

Interviews targeted the main person who pays energy bills in the household, though all household members were invited to participate at the discretion of the main participant. ‘Aided recall’ was used during interviews to help participants remember what they received during the Uniting Energy Efficiency Service visit/phone call. Aided recall included prompts, either verbally or visually, to stimulate memory of aspects of the service previously offered. Consistent with Uniting policy, interviewees were provided with an incentive in the form of a spending voucher of \$80.

With consent, interviews were audio recorded.

2.2. Data analysis

Interview data was auto transcribed from Microsoft Teams then cleaned for accuracy by checking with the audio recording.

Interviews were analysed thematically against key research topics:

- The incidents and factors that contributed to the household experiencing energy hardship
- The services and supports sought and received (including from the energy retailer, governments, community services and the Uniting Energy Efficiency Service)
- The valued aspects of supports and those that were not helpful.
- Other supports that would have helped.
- Outcomes or benefits from supports, if any, and longevity of benefits.

Themes within each broad topic area were identified.

In addition, Journey Mapping was used to reveal the experiences of households before and since receiving home energy assistance. A key purpose of journey maps is to reflect a process or experience people go through to highlight key moments in their experience. A map may reveal experiences that were positive or negative, or situations that have improved or worsened. This information can then be used to inform the design and delivery of improved services with a view to improving people's future experiences, interactions, or situations (Følstad & Kvale, 2018; Berman, 2020). This method helps reveal the key benefits and how they were obtained and sustained (or not). This allows unpacking of the pathway between points (barriers/enablers) and the major steps along the way to reach an objective (in this case, energy-related and other benefits). This produces landmarks in the journey, and what is needed at each landmark, which provides service organisations new opportunities to design and deliver the type of support that is needed, at the time it is needed.

To inform the journey map method, a literature review of over 35 journal articles and grey literature on the application and efficacy of journey mapping was undertaken. Journey maps have been typically used for commercial purposes in a business context, whereby companies map the interactions customers have with the organisation and its services, or in buying or using its product. This helps the organisation identify areas where their service is lacking, poorly timed, or mismatching what the customer needs at the time. The maps therefore highlight gaps in service delivery, which if attended to, will bolster customer satisfaction (Shiratoria, Trevisana & Mascarenhas, 2021).

Journey maps display pivotal events (touchpoints) within a larger experience and track the nature of the experience at each point (Howard, 2014; Ludwiczak, 2021). In this project, touchpoints represent pivotal moments or turning points in the household's experience. This includes, but is not limited to, interactions with Uniting as well as any other events that occurred in the household's journey that impacted their experience of energy hardship. In this way, the impact, and duration of impact of Uniting's services can be mapped while also capturing any other relevant aspects influencing this experience.

Previous projects utilizing journey maps have adopted the interview method as used in the current project (Panzer, Bryant, et. al., 2017; Silvert & Sanagorski Warne, 2019; Lindsay, Proyer & Walters, 2015; Følstad & Kvale, 2018). This method allows rich stories to be gathered from participants, supplying the context and complexity of their journey that can be later mapped reflecting turning points and the reasons for key changes.

A journey map was produced for each of the 40 interview households. A timescale or timeline is provided at the bottom of the diagrammatic map to capture the chronology of the experiences. Key incidents are marked with a dot, with narration as to what each is. Symbols are used to indicate common incidents of interest to this research such as the delivery of the Uniting Energy Efficiency Service, or engagement with the energy retailer. Incidents are connected with a line (path) that is adjusted up or down into experience zones denoting positive (green) (at the top of the map) or negative (orange) (at the bottom of the map) experiences related to energy access and energy hardship. The emblems representing various factors are placed on the map at relevant time points.

The set of 40 Journey Maps became a set of 'texts' that were further analysed looking for common themes, made more apparent by their visual nature, such as key drivers of energy hardship and suggestions for improved support. Exemplars of journey maps are used in this report to explain the factors and experiences of energy hardship.

3. Survey data from householders who participated in interviews

3.1. Data sampling and collection

All interviewees were sent a short outcomes survey as a mechanism to explore how the program contributed to a range of outcomes.

An online survey of six questions was distributed through Uniting's Client Management System once each interview was concluded. The survey asked about: outcomes (changes in life areas); the contribution of the Energy Efficiency Service to outcomes; barriers to outcomes; and areas for service improvement.

The Community Services Outcomes Tree (CSOT) – a framework of 12 domains and related outcomes for capturing the outcomes individuals experience as a result of community services – was used as the outcomes framework for this portion of the study (<https://communityservicesoutcomestree.com>). CSI researchers worked in collaboration with Uniting Energy Efficiency Service representatives to determine the outcomes that were used in this survey.

Seven outcome areas were included in the survey. These outcomes were aligned to four of the twelve CSOT outcome domains.

Table 5. Selected outcomes for the householder survey

Outcome (used in survey)	CSOT Domain
1. Understanding how to save energy around the home	Learning, skills, and development
2. Understanding about the support available from your energy company	Services & government benefits
3. Understanding of government supports and concessions that you can access	
4. Access to services (e.g., other community services)	
5. Having confidence to speak up and ask for help	Choice and empowerment
6. Knowing how to manage your money	Finance
7. Financial worry	

Unfortunately, only 6 of the 40 interviewees completed the survey. This may have been due to the added burden of a short survey following on from a lengthy interview where householders may have felt they had provided sufficient information already.

3.2. Data analysis

Descriptive statistics were generated for quantitative responses to show prevalence of response. The small amount of qualitative data was analysed by comparing to themes already generated in the interview data and importing these thematic codes to describe the responses.

Due to the small number of responses, both qualitative and quantitative data were used to triangulate with other data sources and reported in an integrated way in this report.

Summary of main data sources

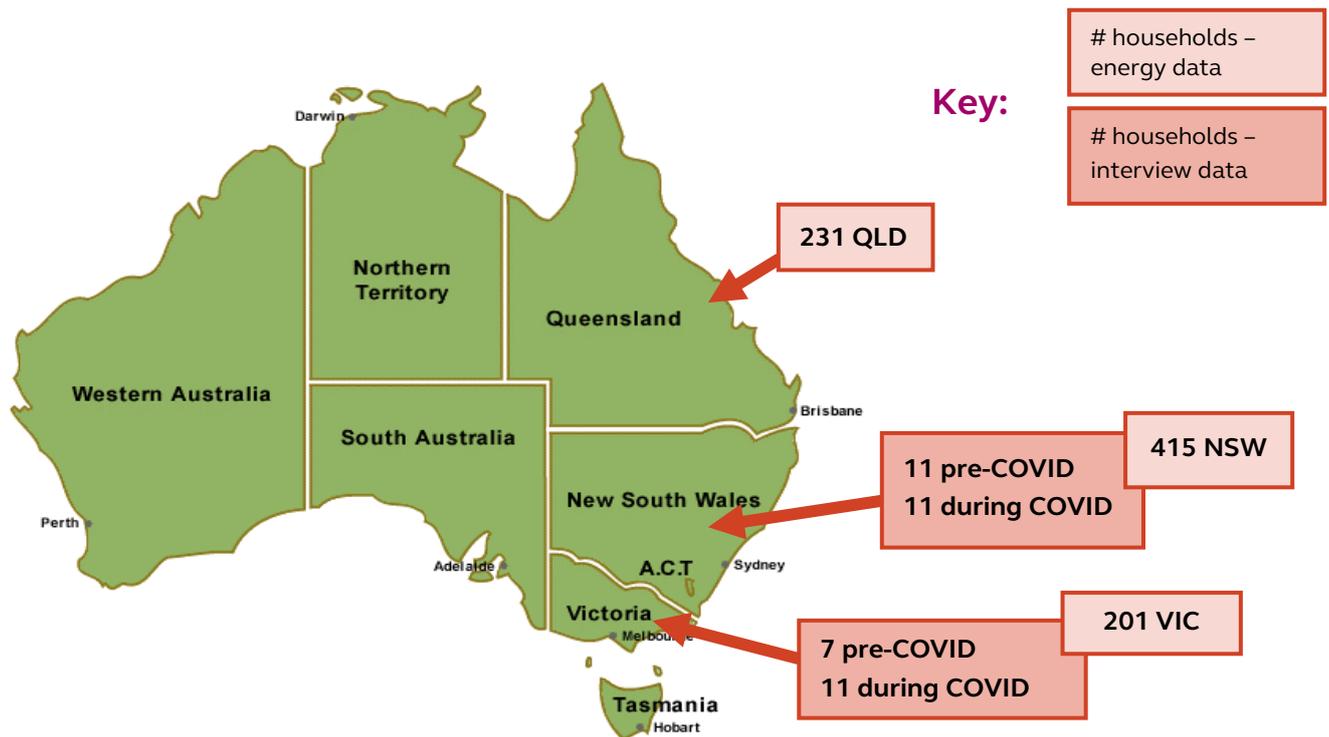


Figure 2. Summary of interview and energy data across States

Summary of key elements of research design

The unique aspects of this project include:

1. Evaluation over a long-term period: Obtaining information about a long-term program to determine whether it is working – evaluation of benefits usually occurs in the short-term, but this project involves participants who received assistance up to 4 years ago.
2. Combining quantitative and qualitative data across multiple data sources to explore the nature of outcomes and the contributors to them.
3. Journey mapping as a way of presenting qualitative findings which highlights key points of opportunity to improve interventions to address energy hardship.

Results

This section reports findings across all data sources and seeks to describe the experience of energy hardship and intervention. It commences with an exploration of the causes of energy hardship apparent in the data, then moves through the experiences of receiving various supports, the outcomes of those supports, and the preferred design of supports.

Drivers of energy hardship

Almost all of the forty interviewees explained the complex set of circumstances that contributed to their energy hardship. One way of understanding these circumstances is through an ecological lens (Bronfenbrenner, 1994), which seeks to identify the elements at different levels of a social ecosystem that influence human experience. Using this approach, energy hardship can be understood to be constructed by factors at the macro, meso and micro levels of the broad social ecosystem in which householders sit.

At the macro level, energy hardship was affected by drivers, such as increasing energy prices, low levels of income (particularly for those on income support payments), and poor quality housing stock. Similarly, meso level drivers, such as landlord or energy retailer behaviour, also contributed to ongoing and entrenched energy hardship. Finally, multiple micro (or individual and familial) level drivers played a significant role in energy hardship. These included personal illness, injury or disability, death of a partner, carer responsibilities (for children or others), and loss of employment, among other things. In any single case, drivers across this ecosystem combined to create a set of circumstances beyond the capacity of the individual to effectively address, despite their best efforts.

Macro drivers

A consistent theme in the data is the **poor quality of the housing stock** available to interviewees. In the main, older housing was draughty with gaps in walls, doors, and floors; poorly or not insulated; with inefficient or absent heating and cooling systems. Such descriptions are numerous in the data, with the following extract a good example.

My house [public housing] is an old weatherboard house. So, it's ancient. 90% of the windows in my house are the original glass. So, they're now super thin. I'm fighting at the moment to get the windowsills repainted that, I offered to do about four years - three years ago, and got told, 'no, we'll do it'. ... even if they came around and put - I'm looking at buying some - it's like a contact and you put it over your windows, and it holds the heat in and keeps the cool in as well. It repels the heat from outside. It's similar to a double glazing. And that's not super expensive. That would help a lot of people. And if my doors fitted the frames right, instead of having an inch gap... If my front door fitted the doorframe, if it didn't have an inch on one side higher than the other side... I've only got one heater through the house, which is this massive AC [Air Conditioning] system, right... it's a split system. To warm my house, the kitchen door has to be closed, the bathroom door has to be closed, ... the living room closed. But with those gaps - and I've bought that rubber stuff you put at the top and all the rest of it - but because the gaps are so big, it just ends up bashing it off, because I've got it at the top and bottom of the door. Once the living room is boiling, I open it [the door] and it'll go a bit into my room but I've got two other rooms at the end of the hall and you're lucky if it takes the chill off. And you've got to keep it on 24/7. To do that, we've got little electric column heaters

on timers, in my girls' room, so that's using more bloody power. I use the electric blanket on my bed...The girls will get an electric blanket to keep their rooms warm and keep their beds warm (Samantha, VIC, during COVID).

Similarly, **increasing energy prices and/or high cost energy deals** from the retailer also contributed to energy hardship and created significant stress for interviewees who feared for the future when costs were likely to increase further.

I'm on a payment plan because I can't keep up with it, even though I do turn things off at the main. I try to have really short showers, I don't use the lights at night. I make sure the lights are switched off. I do everything I possibly can not to consume the energy, but it doesn't matter what you do; it just doesn't stop it being so expensive.... you're not comfortable in your home because you don't want to use anything... you can't live. You can't live (Alyssa, NSW, during COVID).

Underpinning energy hardship were the low incomes of interviewees in this sample, predominantly due to extremely **low income support payments**. Despite doing all they could to reduce energy consumption and cutting back on expenditure in other areas of life, many reported that they simply had insufficient income to cover energy costs.

I got told that my bill would be \$220 a fortnight, and I said, 'I'm only getting \$294.65 a week..' (Ben, VIC, during COVID).

They [Energy Retailer] wanted a lot more money than that [in the payment plan] and I said, 'Well, when you only get a pension and you're restricted to [so much], you've got to split that money around to house payments, you've got to spread them around for the [kids], you've got to spread them round to credit cards and bills'. I live with barely nothing (Alexis, NSW, during COVID).

I'm only on an invalid pension, and I'm paying \$200.00 a fortnight out [on energy payment plan] so I can stay ahead. And I'm finding that really hard. And one bill could be, like not the last one, three bills ago it was \$1,300.00, and then it was \$1,500.00, and now it's \$1,700.00. ... I always get worried now, and just sort of work myself up thinking, 'Have I got enough, have I got enough?' (Tash, NSW, during COVID).

Meso drivers

A frequently discussed meso level contributor to energy hardship and associated impacts was the **role of the landlord and the tenancy arrangements** in place including public/social housing and private rental.

Tenancy arrangements and landlord issues were varied. In several cases, the landlord was responsible for dishonest practices, such as setting up undisclosed energy usage that was calculated against the tenant's bill. In one case, this involved running power leads from the tenant's property for use in the landlord's shed.

The landlord's got a line running from the power box here over to his shed...I've got the police on it and all. ... We've been fighting with him for about a month or so. ... last week [he] went to push me into a big heap of steel in his shed... When we got the first bill, that was pretty high and I just thought 'there's something wrong here' (Brent, NSW, during COVID).

In other cases, dishonest practices have involved illegal metering systems.

Yes, it [Uniting service] was brilliant. It turns out that the landlord had done a dodgy, so I was actually on a shared electricity meter, so that's why my bills were coming in at about two grand a month, because I was sharing it with a family of six next door (Stacy, NSW, pre-COVID).

In this case, while Uniting supported the tenant to gain reimbursement of energy costs, the landlord later retaliated by not renewing the lease.

In other cases, private landlords and tenancy managers refused to make changes to faulty and inefficient heating, cooling, and hot water systems, or installed poor quality, inefficient or second-hand items to address the issue.

The real estate won't replace the air conditioning, even though it breaks down due to heatwaves. And it's a really, really old air conditioner, so it does use a lot of power. During the summertime, we're talking 40+ degree days, I have to have the air conditioning running all summer basically, sometimes at night. Most of the time I can turn it off [at night] but I got to wait until the temperature gets down to 18 degrees, otherwise the heat radiates through the roof and it just gets really hot. So once it gets to 18 degrees I can open the windows up and let the air in... and that's normally like 11 or 12 o'clock at night. My energy bills are high here, and... the charge is higher here ... because we're in a regional area (Jayden, NSW, pre-COVID).

I'm talking huge bills. It was an old farmhouse, and when I first went into it there was no heating or cooling, and the owner - an old lady - put in some sort of fan heating thing, which chewed the electricity, and then she put in a wall unit through the window, an air conditioner, a through-the-window one. But you couldn't turn it down because it was a second-hand one ... And as I said, the bills just got higher and higher and higher. Oh, I was hysterical. I've spent three years busting my arse to pay off electricity bills (Kylie, VIC, during COVID).

Interviewees described their increasing energy debt being at the mercy of private landlords who failed to support tenants to responsibly manage energy consumption. While in some cases the tenants were able to build effective relationships directly with landlords, some found tenancy management by real estate agents to be 'lazy and inefficient'.

I can't save power in my rental, because they've got these [downlight] halogen lights... When you're in a rental you don't really have much choice... five years ago we owned our own house. So if I wanted to do something that would make us more energy efficient, put solar in, I could do that. But I can't do anything in a rental... They're [real estate tenancy managers] terrible, they really are! (Summer, NSW, pre COVID).

As described above, interviewees' circumstances often meant that they were forced to accept poor quality housing, or tenancy conditions that were not beneficial to them. One interviewee reported that they had had difficulty accessing private rental and were forced to accept a property that came with a pool. A condition of tenancy was pool maintenance that included mandatory operation of a pool pump that was identified as the source of very high energy bills.

I was going through a lot of stress at that time as well and I was telling them [Uniting] about the landlord and the electricity and how the electricity was [costing] nearly \$900

... and he [landlord] wouldn't fix the pool pump ... In order to keep the pool maintained, which is part of the tenancy, it was a requirement to have to run it. But how do you run something you want us to maintain, and you don't want to fix it? (Allanah, NSW, during COVID).

Similarly, tenancy experiences in public or social housing also contributed to energy hardship. Interviewees commonly reported refusal to retrofit public housing by the housing manager, delays in any agreed retrofitting, like sealing gaps, and when tenants invested their own funds in retrofitting they were told they would bear the full costs of all maintenance of these upgrades to public housing stock (even those they could not take with them if they moved).

[It's] really hot upstairs because we've got bedrooms upstairs right under the roof, there's no insulation. And I did some improvements– downstairs I installed an air conditioner and I've got just fans from K-Mart for upstairs, but you can't do much because there's no insulation up the top. It's an oven. So in the summer, when it's really bad, we go downstairs in the lounge and we just live there with the dog. However, then I did question [Public] Housing about it, because it's their property, ... it's just like no point. Housing but no housing. I had to provide all these letters for my sons [to justify requested housing improvements on medical grounds]. ... It's been months and months and just getting someone to have a look and just put some very little fans in the roof, ... or put some insulation ... it's a huge process. And if you're paying money for this, you should be feeling comfortable. So I don't think that they have any interest in you being comfortable. They're just happy: 'Yeah, yeah, got this. You got it occupied. You got it now, capped for a price when you're a low-income earner. You should be happy that you got it'. Well I am happy because it's security. In a private market, you can be kicked out any time they're selling the property, right?... But the windows are very shonky and like I said, there's no insulation up the top so no matter how much you try to prevent the heat coming in – you know now I have installed curtains, I paid for the curtains. They are the block out [ones]. So they do help as well. Like I said in the evening, it's an oven upstairs (Alice, NSW, pre COVID).

Where I live, it can get below one [degree] in the winter. You run out of hot water by about 6 o'clock at night, at the latest. And then the water is stored but it's that cold that it's constantly reheating itself. [Tenant organized own replacement hot water system to save energy costs] and now I've been told by the Department [of Housing] if something happens to it or there's a problem, I have to pay for it. It doesn't matter [that you have paid for own retrofitting and] if you're trying to cut down the energy bills, you're trying to do the right thing (Samantha, VIC, during COVID).

I wish they'd [Public Housing] have come out to maybe have a look at the house and see what's going on and work out what next, so to speak. I even said something even back then when I heard about split systems and all that, I asked them about it and they said I would have to install it [myself] at the time. And they said if I leave I'd better take it out and put it back to the way it originally was (Brayden, VIC, pre COVID).

Energy retailer behaviour towards clients was also a major contributor to householder stress and energy debt. Many of those on payment plans reported pressure to increase them from the energy retailer, often well beyond what could be afforded.

I could only afford a certain amount a fortnight and the electricity company was telling me, 'In order for you to pay off your electricity bill, you need to actually be making \$80 payments a fortnight'. And I was, like, 'I can't even afford that'. So, I was struggling (Alannah, NSW, during COVID).

They [energy retailer] just keep on ringing me and hassling me and I just tell them I can't do nothing about it because I'm on Newstart. And they're like, 'You can pay this much every fortnight', and I'm like, 'Well, I don't have any money. I got paid on Friday and I'm broke today. I've got nothing'. I've got nothing. I don't know how I'm going to get food, I'll have to go to Salvocare and get them to help me get some food. ... They [the energy retailer] come to me and say, 'Well, you can pay this amount otherwise it's going to get cut off' (Bryce, VIC, during COVID).

Originally, I started off on \$60 a fortnight [payment plan] and then they [the energy retailer] sort of wanted to put it up a fair bit and I said, 'Look I can't afford it. If I go up that high, it's a matter of paying it or feeding myself' (Teagan, NSW, during COVID).

In this last case, despite the dire situation for the householder, the energy retailer persisted with a payment plan increase though at a slightly lower amount. One interviewee in rural NSW reported that she could not afford the increase in payment plan instituted by the energy retailer which led to the loss of the payment plan when she failed to deliver the required level of payment. Similarly, another consumer reported having her energy disconnected after missing one payment on the payment plan.

A few years ago I had a bad experience with them [energy retailer] where I was screaming down the phone... They cut my electricity off and I'm on a payment plan but I missed one payment. I wasn't aware of it and they cut it off and they wouldn't put it back on. And I lost all my food in the freezer, I lost everything. And I was a single parent, – and I lost everything (Alyssa, NSW, during COVID).

Interviewees also reported issues in getting the energy retailer to address queries about unusually high bills.

I'd been arguing back and forth with the electricity company about the fact that there was no way the bills were coming in that high for such a tiny little place, and getting nowhere. ... [It was] a couple months of constant arguing over the fact that the bills shouldn't be that high before I was referred to someone... They couldn't see logic from the fact that you'd say it's a one-bedroom place, why are the bills \$3,000. It worked out that we were 'using' enough electricity for, I think it was, like eight people. And they were just more interested in obviously pulling in the money, which – we don't use that much electricity and they want the money for it - but not looking at resolving the issues themselves (Stacy, NSW, pre-COVID).

They [energy retailer] frustrate me to tears because they don't accept that they could have possibly made a mistake, it's always your fault. 'You mustn't be telling us the truth' and 'it couldn't be that high if what you're telling us is the truth'. But I don't lie, it doesn't get you anywhere and they're the ones that read the meters and that, so they can tell if I'm lying. They just frustrate me to tears (Annalise, VIC, during COVID).

Similarly, many reported a range of other billing problems that created unexpected debt. For example, one person received a bill purporting to correct what the energy retailer claimed was three years of under-charging.

They didn't give a rat's what we said. ...they said they'd been undercharging us for about three years. They tried to recoup all that money in the three years and the Ombudsman said, 'No, you can't do that' (Ben, VIC, during COVID).

Multiple interviewees reported the stress of trying to deal with a worrying issue but only being able to speak to a call-centre operator with insufficient English, little knowledge of local geography and conditions, or whose accent made it hard to understand, especially for those with hearing impairments.

When I questioned it [high bill], I didn't get anything. So I've been trying to deal with it for ages, and it's just been extremely stressful ... They keep emailing me, and I reply to the emails, and then someone phones me up that speaks terrible English and can't even talk to me properly, and I put the phone down. Because I refuse to speak to someone that can't even speak proper English... it gets me nowhere. It's like they're reading off a script, and they're just not listening to what the problem is.... And I'm happy to pay what I owe, but I will not pay it until they correct my bills. And they're not responding, and they're not being very helpful at all (Summer, NSW, pre COVID).

Several interviewees reported difficulties in having their energy retailer changed without consent, resulting in high bills and difficulties in finding out how to revert to their original provider/plan. In one instance, this took 12 months to correct.

Micro drivers

The personal circumstances of interviewees and their families had a significant impact on ending up with the experience of energy hardship. In most cases, multiple elements combined or cascaded to foster the conditions that led to energy hardship.

As identified in the literature, many interviewees had experience of **physical or mental illness or disability**, of their own and/or that of family or household members. This was identified a factor in the subsequent energy hardship.

... unfortunately I do suffer with mental health issues and there's times I can't even afford my medication [and also cuts back on food] (Alyssa, NSW, during COVID).

Just being unemployed at the time, mostly, and it's just my mental health wasn't the best at the time so it was really a bit of a struggle on both fronts. And then not really - not really understanding it [the energy market] properly as well, through how it all works (Venessa, VIC, pre COVID).

I was going through a really bad time. Hubby had ... a very bad motorbike accident some years ago and had to have his back fused and it makes it difficult for what kind of work that he could go for. It was a case of he wasn't working. We had not long moved up to [rural area] at the time and I hadn't really established myself as far as work. I thought I was going to retire but it turned out that I didn't. I ended up having to start cleaning houses and stuff like that to make ends meet or put food on the table... We did have a mate that was staying here, who's passed [died] now, he was also going through a hard time. He had shocking rheumatoid arthritis and a heart problem. He was homeless and being who we are, I just thought 'well we can stretch it to a third mouth if we have to'...

Anyway, it was quite a rough period and very hard. I'm a positive person and it was just very hard because my husband and this mate of ours, they were very bad depressing, like depression – I just felt like I was juggling too many things in the year trying to make ends meet ... each time I've had to ask for help, I guess I've been pushed to the limit (Nicole, NSW, during COVID).

I got sick in 2017, and I was renting, and I unfortunately had lost my job; I got a heart problem - ... and I had to lose my job and lose the place that I was renting, and I'm so-called homeless for nine months, and all my furnishings and everything had to go into storage. And the storage company shut my fridge up, and it became mouldy, and then when we opened it all the seals went on it, all broke, because it had been shut up for 9-10 months (Kylie, VIC, during COVID).

And I think it was due to COVID, I wasn't working at the time. I've got two children, both on the [Autism] spectrum. I've got the youngest one at childcare; he's only four. He's at home with me two days. So yes, I've got to – access speech and OT [Occupational therapy], some you have to pay out of pocket, some do get covered from government funding, NDIS packages (Aliana, NSW, during COVID).

I'm on a pension and over the last two years I have been treated for two lots of aggressive cancers. And as a result, living on the pension and having two years of medical expense, I found myself in a position where I was struggling to meet my overheads and one of them was the energy bill, which went from a staggering \$500 to about \$1,000, and that jump was mainly because of the unusually cold winter that we had and wet winter that we had and my using the central heating (Ryan, NSW, during COVID).

At that time, I wasn't on a financial hardship [plan] and there was just no way I could pay bills out of the Centrelink income. I was also really unwell, in and out of hospitals, and taking lots of painkillers and so your judgement is impaired, and so any help is good help (Carrie, NSW, pre COVID).

Especially with suffering with depression and menopause. My whole ability in life has changed for the worst for me and I'm trying to deal with it (Summer, NSW, pre COVID).

The presence of illness or disability also brought with it specific energy needs for heating and cooling to manage the condition. Several interviewees talked about the need for heat and for hot showers to assist with rheumatoid arthritis. Other conditions similarly required energy use for heating and cooling:

Because I have chronic fatigue syndrome so I can't get cold or I get really sick and my heating is on all the time so that has to be a priority. I just scrimp in other ways because that is very expensive - the heating (Hannah, VIC, during COVID).

When it comes to warmth, I can't compromise on that due to my circulation problems, so I've got to have the nice warmth in the house... the heating was the biggest problem, because I couldn't handle the cold ... because once it gets too cold, I can't cope – my body just goes straight to freeze, and then that's not very comfortable (Molly, VIC, pre COVID).

While the majority of interviewees were receiving government income support, others were employed but on low or unstable incomes. **Changes in employment and income levels** was a common trigger for spiraling debt and energy hardship.

In the job I do, it chops and changes all the time, because I'm a support worker for disabilities and mental health people in their homes. And all you need is for one of them to go into a facility or to go into respite or to die, poor dears, and it affects your whole finances so much. It varies (Annalise, VIC, during COVID).

In some instances, energy hardship was strongly linked to **family situation**. For example, one interviewee, a retired widow on a pension, lives in a nine person household of three generations of family members. Her energy bill is regularly in the order of \$1500 per quarter which, while being beyond her income, is not unreasonable for the number of people in the household. While she tries to minimize energy use, she is also wanting to provide a positive environment for her great grandchildren:

I've got a little 3-year-old great-grandson as well here, and his sister and little brother, and the little 3-year-old the other day – I didn't want to put Christmas lights up, because of the cost - and he just came up to me the other day, he said, 'Nanny, I sad'. I said, 'Why, darling?' And he said, 'We got no lights'. Well, that was it – now the front of the house is done up like a bloody airport. ... Yeah, I want to do it for him. I think, 'Oh well, next bill will be just another'... I thought, 'Oh well, if it goes up, it goes up'. Just to see the smile on his face that night when we put them up with lights, yeah (Tash, NSW, during COVID).

Similarly, another person – though usually living alone – provided shelter to her best friend and her son with a disability when they lost their house due to flooding. This caused energy bills to increase.

My best friend was in the Rochester floods just recently, and her and her son arrived here with two rabbits, one cat, one dog, one bird, and they both sleep at night time with fans on them. So I had a fan running in the spare bedroom for her, and a fan running in the lounge room for him, and they were here for a month and then they went. And then she came back because she was put into a couple of caravan parks, and she was only allowed to stay for 10 days in the caravan park, and then had nowhere to go. But he watches TV all night and has a fan running all night and then during the day (Kylie, VIC, during COVID).

Several interviewees also reported how they had taken on debt from other family members when they defaulted.

I was left with a \$900 bill from my daughter's father who basically left the home when she was born, so I was going through a lot of stuff and ... I was really stuck because he left me with that nearly \$1000 bill and then it was hard to try and move forward - getting more bills in the future and stuff like that (Allanah, NSW, during COVID).

Intersecting drivers of energy hardship

The methodology of Journey Maps captured these multiple elements well. Below a series of case studies are presented to elucidate the circumstances that construct and maintain energy hardship. Notably, these case studies show how, in each case, energy hardship is created then exacerbated by multiple factors operating at the micro, meso and macro levels of the ecosystem. In most cases across the 40 interviewees, energy hardship was triggered by one or more incidents that took the individual from coping financially to being unable to meet energy expenses.

Carrie, NSW

Carrie had worked full time all her life and purchased her own home in the 1990's. In 2019 she became seriously ill and could not work, commencing unemployment benefits. Over three years she had multiple surgeries but was deemed ineligible for a Disability Support Pension. Being at home all the time, she started to receive 'terribly high' energy bills. She sought help from a local community organization who supported access to Energy Accounts Payment Assistance (EAPA) vouchers, but finally called her energy retailer when payment difficulties mounted. Her energy retailer referred her to Uniting who arranged a \$30 per fortnight payment plan with the energy retailer, and suggested a government appliance buy back scheme, which she accessed to replace her power-hungry older fridge and freezer. Uniting also supplied an energy efficiency (EE) kit with EE tips, and information on No Interest Loans and other support services. Over two years, the payment plan moved her debt to credit. However, with recent increasing energy prices, she notices her bills rising again. In desperation, she has cut the cord to her dryer.

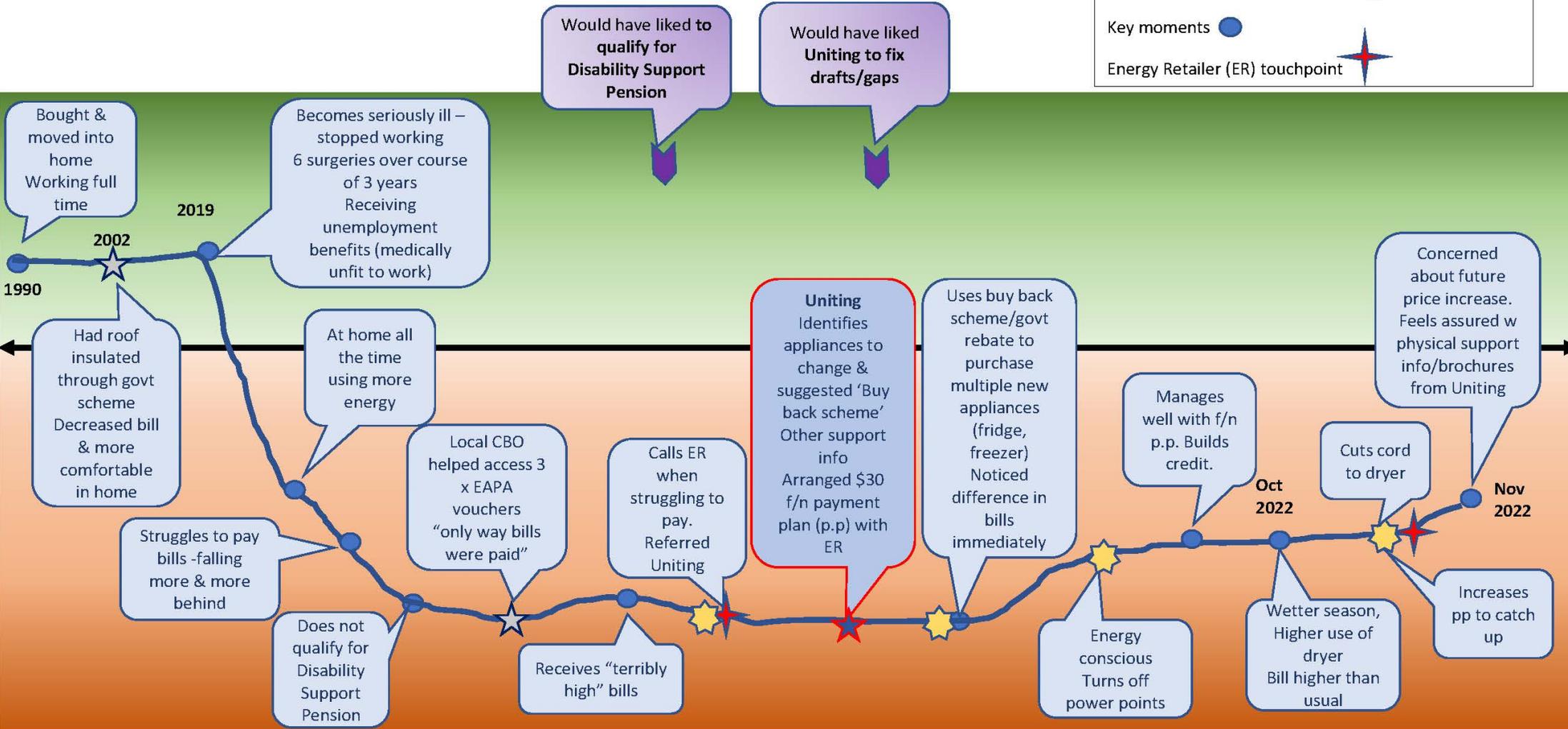
As I said, I was so seriously ill – you don't have six operations in three years and not be really not good, and going constantly to doctors, and specialists, and X-ray, and everybody, and having needles in your neck to numb the pain until you can have surgery on your spine. I think that was a very traumatic time for me because I've always worked, I've worked all my life, and I'm 57 and it's only been the last three years that I've physically not been able to look after myself and I had to ask for help. So, I was really not coping, and the only way my energy bills were getting paid, at that time, was via that EAPA system and the vouchers. They [community service] paid for some of my scripts as well ... I'm suddenly at home all the time instead of being at work all the time. That was another thing. See, I was usually out of the house for at least 40 hours a week, at least, and suddenly you're home 24 hours a day, seven days a week, except when you're in hospital, and so obviously I'm watching movies, it's a totally different lifestyle to what I'm used to... Yeah, that was a major lifestyle change, going from somebody who's worked since I was 12, and I'm 57, and as I said, the last three years I can't work at all, so it has been hard (Carrie, NSW, pre COVID).

Journey Map

Participant name: 57 years, Carrie, NSW, Pre COVID

Householder Info: lives alone, home owner, unemployment benefits, energy inefficient home

- Coping strategy 
- Uniting's Service 
- Community Based Organising (CBO) touch point 
- Support that would have helped 
- Key moments 
- Energy Retailer (ER) touchpoint 



Lachlan, rural Victoria

Lachlan is a single person living in rural Victoria on a property he purchased from his parents. He has been a long term carer for both his parents while working full time as well. Due to multiple surgeries, he became unable to work and experienced a sudden drop in income. Not long after this, his parents passed away and he assumed sole financial responsibilities for bills in the house. With multiple bills coming in, hard on the heels of funeral costs, he accrued an energy debt of around \$1600. About this time, he was denied the Disability Support Pension due to a technicality in relation to the selected treating physician completing the application. With Uniting's help, he accessed several government grants which enabled him to catch up on other bills and reduce stress. However, in the middle of Covid, more high energy bills came in and he arranged a payment plan with his energy retailer, but at a level beyond what he could afford. As a result, he adopted extreme budgeting measures, though he had little room to decrease energy use.

I'm not working, and I was waiting for surgeries, and then COVID lockdowns. And then shortly before that Mum passed, so I had the funeral costs, and every other bill was coming in... And living out of town so far... because the fuel out here's a bit more expensive ... I'm waiting for two surgeries. I'm on the waiting list at the moment for two, possibly three... And because I've got ADD [Attention Deficit Disorder] and I've also had mental health issues... [but denied DSP], they sort of broke me, and I just don't have the will to push it. They broke me on that [denial of DSP]... And living so far out of town, and when you go shopping, it's the fuel costs out here, there's no bus service or anything, so you don't have any choice... When you're by yourself – I don't live with anyone – you still pretty much get the same bill if there's two or three people living in the house. You've still got the fridge running, you've still got a TV running, you've still got certain lights running, you've still got a hot water system running. You're not splitting the bill with a second person or a third person. That's the hardest part if you live by yourself, you've pretty much still got the same power bill as if a family's there. Might be a couple of hundred bucks difference, but that's about it. And you've only got the one wage or the one pension or whatever it is... You still have the service fees, they're all the same, which is pretty high up anyway, and then you've got the actual usage (Lachlan, VIC, during COVID).

Journey Map

Participant name: Lachlan, VIC, During COVID

Householder Info: Regional/rural, 1 person household

Coping strategy 

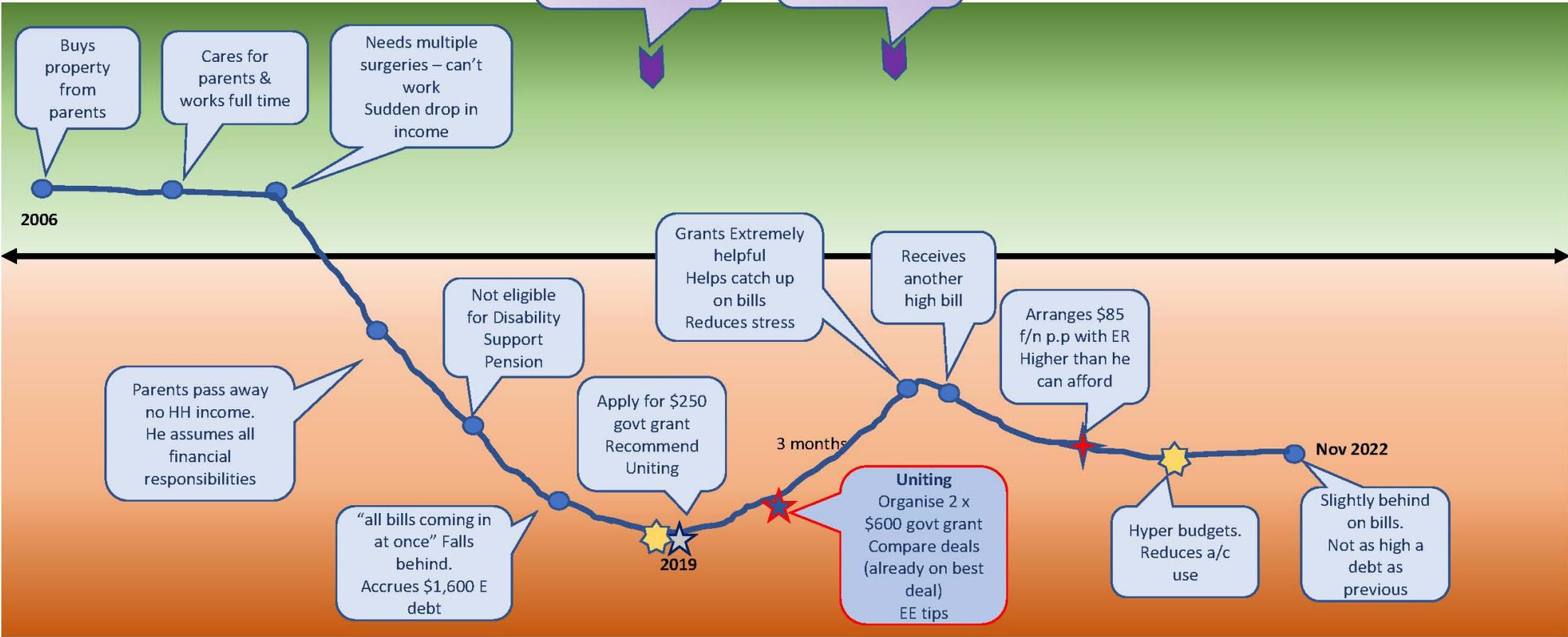
Uniting's Service 

Community Based Organising (CBO) touch point 

Support that would have helped 

Key moments 

Energy Retailer (ER) touchpoint 



Samantha, rural Victoria

Samantha is a grandmother living in public housing, having previously lost everything she owned in a house fire. She receives a carer's pension and kinship payments to support her ongoing carer role to her grandchildren and great grandchildren. She lives in a four person household, which expands most weekends and some days of the week with the regular care of grandchildren. Her 18 year old grandson, who has Autism, is one she regularly provides care for. Because the family lives in rural Victoria, Samantha needs a car of sufficient size to transport her grand and great grandchildren to kinder and to disability services. She estimates that this is about 800 kms per week. While she needs a large car, which is expensive to run, so she can transport her large family, ideally she would like a small car to use when not transporting children, so as to save on fuel costs. However, she feels that she has little capacity to action this as were she to trade in or sell her car, its value is less than the remaining loan on it. The role of carer has meant that she has also provided financial support to her family members, such as paying her daughter's accrued parking fines of \$4000. While she has accessed No Interest Loans, she regularly uses high interest loan providers to make ends meet or for special occasions like Christmas. She is a savvy energy user and is vigilant about the star rating on all appliances. However, her public housing is of poor quality, with a faulty hot water system. Her application to install solar hot water was rejected by her housing provider. With so many children in the house, and her Autistic grandson having specific energy uses (described below), she cannot reduce consumption. Currently her trajectory is one of increasing cost of the payment plan with the energy retailer, despite her income not increasing.

My 18-year-old grandson comes up here, my Autistic grandson. He'll bring his switch. He'll bring his phone. He brings his little laptop. My phone lasts me all day and sometimes into the next day. He has to keep recharging his phone. He has to keep recharging his computer. Then he doesn't turn the TV off at night. He falls asleep with the TV on. He can run up a power bill like you wouldn't believe.... I had to replace a washing machine the other week. I go through people like Rent4Keeps. And I did that with my fridge. I know the government is trying to stop a lot of that now. But for people on pensions, that's the only way – you can't do overtime on a pension. And for people on a base rate pay, I know the interest is super high. But then again, you just suck it up and accept it, because it doesn't matter what you have to buy on a pension, their rates are always higher than if you're working, because they know you've got nowhere else to go (Samantha, VIC, during COVID).

Journey Map

Coping strategy 

Uniting's Service 

Community Based Organising (CBO) touch point 

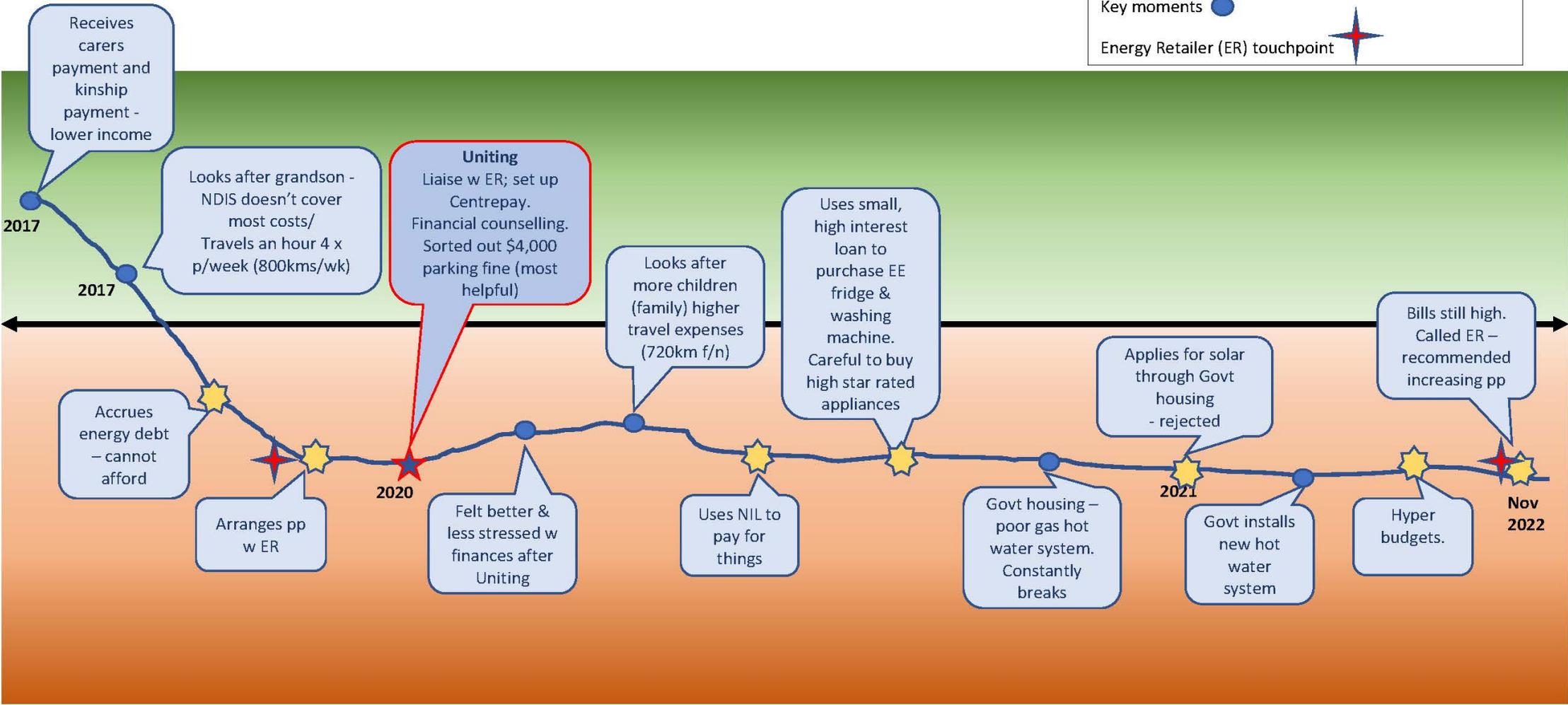
Support that would have helped 

Key moments 

Energy Retailer (ER) touchpoint 

Participant name: Samantha, VIC, During COVID

Householder Info: Regional/rural, Govt housing, carer's pension, 4-person household plus regular additional care for great grand children



Montana, Victoria

Montana owns her own home and receives a Disability Support Pension due to her ongoing condition of Bipolar and other mental health conditions. Her disability has caused significant debt, to the extent where she nearly forfeited the mortgage. She has needed financial support at times over many years and has maintained a payment plan with her energy provider over this time and accessed relevant government grants repeatedly. Despite her limited finances, she has tried to support her daughter by paying for counselling after her daughter was a victim of crime. During Covid, her Disability Support Pension was cut off for a period of 6 months, her debts mounted, and she needed food relief to survive. While things have evened out now, she fears for the future when her partner will have reduced income as he retires and goes on the pension.

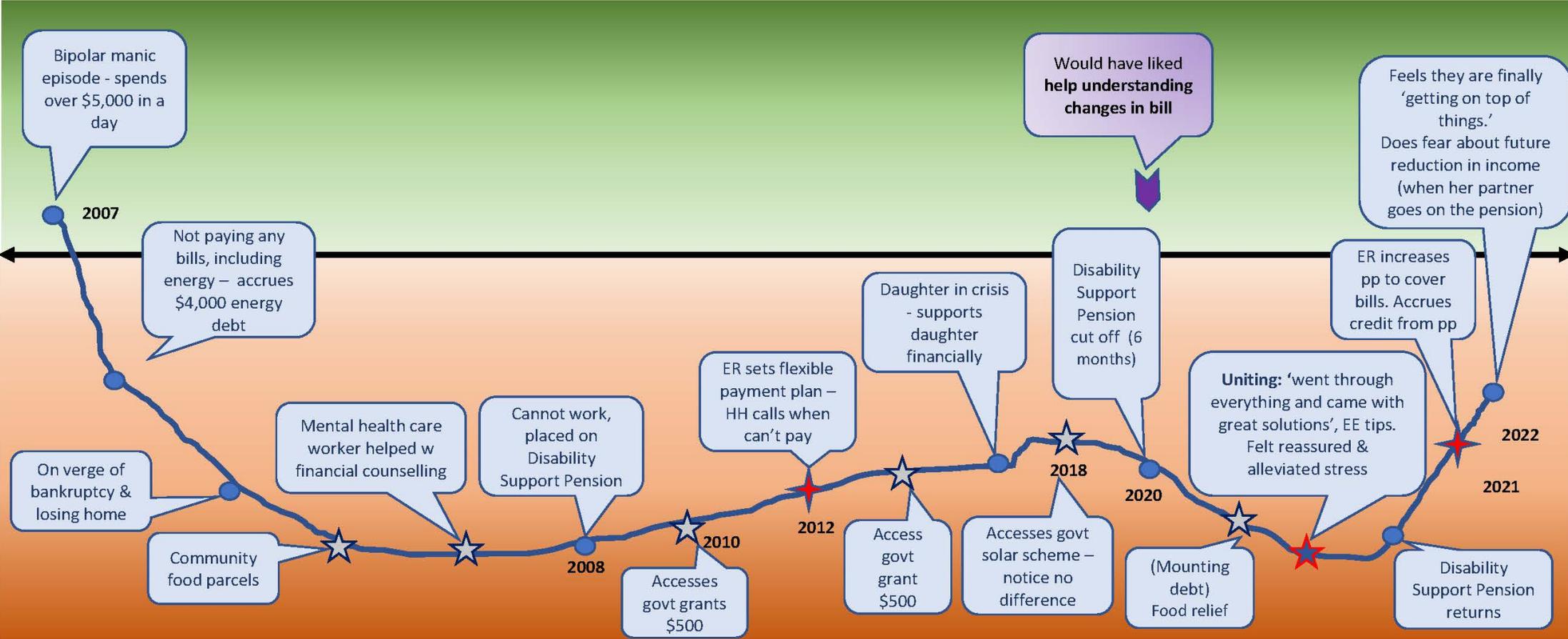
In 2007, we nearly lost our house because I had bipolar, and at that stage ... I got post-traumatic stress disorder. Anyway, what I was doing was I was in charge of the bills, which was the last person who should've been in charge. I wasn't paying any bills, but I was going and spending money - like there was one day I went and spent nearly \$5,000 in just one day at the shops, scared my daughter silly that she's still - 15 years later - traumatised because she was so scared about it all...I landed up in the hospital because I had a panic attack, and they got the mental health team involved ... who then got a financial advisor or financial person involved. They helped me write letters to all the different places. And one of them were the energy services, both the gas and electricity, that totally got out of hand....And that's happened numerous times because of my bipolar. ... Recently I think the last time was my daughter actually was a victim of crime, and she needed money for counselling. And because I'm actually on permanent total disability now - because of my bipolar, I can't work, and so I was trying to help her out, which was causing me going backward [on energy bill payment] (Montana, VIC, during COVID).

Journey Map

Participant name: Montana, VIC, During COVID

Householder Info: Family of 3, Disability Support Pension

- Coping strategy 
- Uniting's Service 
- Community Based Organising (CBO) touch point 
- Support that would have helped 
- Key moments 
- Energy Retailer (ER) touchpoint 



What was the nature of the support received by the household?

Householders sought and received support from a range of organisations to address both their energy hardship and related issues. Many interviewees had accessed a range of services over a period of many years.

Uniting Energy Efficiency Service

Consistent with best practice cited in the literature (McAndrew et al., 2021), interviewees reported a range of interventions provided by the Uniting Energy Efficiency Service. These included:

1. Analysis and explanation of energy bills and check on best rate/deal.

They [energy retailer] make the bills so complicated that you can't understand - they're not simple - so it's not easy and it takes a bit of time to constantly be checking things and ringing around and checking on the internet and making sure you're on the right plan and all that kind of stuff (Hannah, VIC, during COVID).

He [staff member from Uniting] did help me. He stayed in contact with me and he was wonderful, just to talk to at that point...I was glad that he knew what he was talking about, because they [the energy retailer] confused the shit out of me. There was no point me ringing the electricity company and trying to go through the bill with them, because they're too hard to understand- this kilowatt or what a watt is. I don't get it- I don't know, and he [Uniting person] understood the bill really well and he could see there was a problem (Miranda, NSW-rural, pre COVID).

I think the major thing for me was how to read the bill and what were the hours for me to reduce my bill by washing and dishwasher and all this stuff. So it was really helpful for me (Alice, NSW, pre COVID).

2. Advocate to energy retailer for better deals, meter checks and appropriate payment plans (including negotiating reductions in payment plan terms)

- often through 3-way phone call
- support complaints to Ombudsman.

The main thing was at that time [energy retailer] was wanting me to pay a lot more per fortnight than what I could afford to pay, and they [Uniting] sort of helped by saying if that's the amount that I had told them [energy retailer] that I could pay, that they [Uniting] could correspond with them [energy retailer] and tell them no, that they've got to accept the payment (Teagan, NSW, during COVID).

I just think the main thing that helps people, like it did with me, was those people who cared enough to say, 'I'll call your electricity company. Let me talk to them' and 'I'll apply the EAPA vouchers for you on there and you don't do anything', or just being able to access that - if it wasn't for that I don't even

know where I would be to get my electricity bill down because you're just never going to win on those things (Allanah, NSW, during COVID).

The most beneficial thing was she [Uniting staff] got everything sorted out for me, so I could manage all the payments (Samantha, VIC, during COVID).

3. Information about and assistance with accessing grants and rebates

They [Uniting] told me about the energy relief grant ... They were really helpful (Annalise, VIC, during COVID).

4. Provide relevant energy efficiency tips

Such as:

- using only one load of washing
- washing during off peak energy times
- blocking off house to heat only some rooms
- turning off switches.

I'm more knowledgeable and I'm implementing what I learned into practice, like the time when I am using energy and how I use it less (Alice, NSW, pre-COVID).

5. Suggest or assist with retrofits and appliance upgrades

They [Uniting] jumped in and helped me with the fridge, and I don't know how I could thank the lady enough. I was just so excited and happy I got something that might help reduce ... the usage. I was so excited... they bought me a complete new one and it got delivered... I couldn't believe it. I was so excited... I noticed - like, my bill just recently, it said it was a decrease of 23 per cent (Alexis, NSW, during COVID).

They [Uniting] sent me out a heated blanket to save having the heater on so much (Sarah, VIC, during COVID).

6. Undertake home assessments of appliance consumption

I've my handwritten notes from the phone conversation I've got where I went through the whole house with him [Uniting staff member] and wrote down every appliance I had in the house, and he told me what I was doing (Carrie, NSW, pre-COVID).

7. Provide information about and referral to support services, including other sources of financial relief.

He's [Uniting] given me things like the New South Wales Debt Hotline, the eco vouchers, he's listed every support service that I could be able to access if I need it. So, I think it's above and beyond what I was expecting (Carrie, NSW, pre-COVID).

Uniting were very good, they assisted me emotionally and with food and vouchers and that as well. It was very good (Nicole, NSW, during COVID).

The vast majority of interviewees reported receiving multiple components of support provided by Uniting, consistent with evidence on effective interventions cited earlier (McAndrew et al., 2021).

Energy retailer

Almost all interviewees had already had contact with their energy retailer in relation to energy hardship, either recently or in the past or both. In many cases, it was the energy retailer that referred the consumer to the Uniting Energy Efficiency Service.

The majority were already utilizing payment plans, prior to contact with Uniting, with many having been on these arrangements for years. For some, payment plans had worked well to both pay down debt as well as to 'get ahead' and, in a few cases, even build up credit. For some, but not in all cases, payment plans also acted as a safety net against disconnection.

The chap that I was with [from the energy retailer], he was really good. He worked out a payment plan for me and we sorted that out, so there's not problems... I was worried because it was a lot more than that. I kept getting reminders like 'Your bill is overdue; you bill is overdue'. But the chap explained it to me and I didn't realise that if you're on a payment plan, they will never cut your electricity off because you've put your hand up and asked for help. Like you've asked them to work out a payment plan with you, and the fact that it's coming direct from Centrelink to them, not into my account and then me paying it. Yeah, he explained to me and I said, 'Oh, I didn't know that' and he said, 'Well, we don't advertise it' (Nicole, NSW, during COVID).

If I couldn't make a payment they would accept that as long as I made some payment, or made contact with them. So I did all that, and yeah, occasionally I have to ring them and say, 'I can't make a payment this fortnight', and they're pretty good with me now... I can ring the customer advocacy team if I'm really in strife (Kylie, VIC, during COVID).

Well-designed hardship support and payment plans, with guarantees against energy disconnection functioned to reduce stress, enabled households to manage their income across multiple bills, and to maintain energy payments. Several interviewees discussed a particular type of payment plan with additional benefits. This was found to be of great value but was not available on an ongoing basis in all cases.

Origin had a 'power on' program, where they had matched – I think if I had paid one \$70, they had matched two, one payment to my two or three that I had made. So it was a pretty good payment plan, but I think that only went for a certain amount of time. It wasn't – I don't think it was a year (Aliana, NSW, during COVID).

Seven of the forty interviewees had found the energy retailer particularly helpful, and a further portion had established a positive working relationship (usually around payment plans) after an initially rocky start. The hardship department or customer advocacy team was identified as offering a range of support and being helpful and understanding.

They were really good. I spoke to them, just through their chat feature on their website. Then I got referred to the hardship department, and they were really good, very, very helpful (Bradley, VIC, pre COVID).

I find that if you get in touch with them as soon as you can and let them know what's going on, most of them, the people that I've spoken to, have been quite reasonable (Nicole, NSW, during COVID).

Two interviewees explained that the energy retailer had been responsible for proactively identifying concessions or rebates for the consumer.

If our bills were a bit on the high side and my husband phoned and said, 'Look, we can only pay this [until we get the] next pension'. They'll say, 'Okay, let me see if there is any sort of subsidy here'. And they check the account and if we haven't had the amount given to us, they say, 'Did you realise that this amount can be given to you for you to pay bills that you're having difficulties with?' (Bella, VIC, during COVID).

However, more consumers criticized energy retailers for not being proactive in following up or offering concession and rebate entitlements (discussed later).

Other sources of support

Interviewees accessed a range of government support programs including retrofit schemes (for example to install solar power systems), new-for-old appliance buy back schemes, bill review programs, and free energy consumption meters for appliances. All of these were seen to be beneficial and, in some cases, such as installing solar power or gaining new energy efficient appliances, had a lasting impact over multiple years.

I've had the toilet, I've had the insulation done, and now had the fridge freezer replaced so it's more energy efficient. So, I try to take advantage of any scheme that the government is putting ahead (Carrie, NSW, pre COVID).

A range of schemes exist to credit energy account holders with differing amounts of money. Some interviewees were aware of these programs and regularly sought to have these credits applied to their energy bills. Many interviewees, however, accessed these schemes via an intermediary, most usually a community service provider (such as Uniting, Salvos, Vinnies, Brotherhood of St Laurence). Alongside payment plans from retailers, these programs were the main way that householders with accumulated debt could gain any ground in paying down this debt.

In addition to linking to eligible rebates and grants, support from community service providers included referrals to other government funded retrofit or appliance replacement programs. Community services also provided food, clothes, appliances and hygiene products.

Some interviewees showed reluctance or even shame in accessing support services. For example, one person explained:

I felt very humble and embarrassed that I had to ask for help. Because I worked in Sydney in Community Nursing for 20 years, I know how many people ask for help and what happens there. For me to actually have to ask for help, I felt quite awkward about it. I was on the other side of the fence... I only go and ask for help when I'm really pushed to the wall (Nicole, NSW, during COVID).

However, others had a positive attitude towards what was sometimes seen as a knowledge and skill set in knowing how to manage in difficult times through accessing all available support.

Did the support make a difference?

Energy use – quantitative energy data

Decreased energy use

Energy use data of all homes (847) within this study was compared before and after the Uniting Energy Efficiency Service. Energy use decreased in the period (of up to 12 months) after the intervention. Table 6 shows the average daily energy consumption both prior to the appointment intervention date and after the appointment. It shows that reductions in the average usage were seen, especially in Queensland where there was a 10% reduction (i.e. 2.5 kWh per day). Victorian homes saw a 6.3% reduction (1.3 kWh/day), but in NSW only a very small reduction of 0.6% (0.2kWh/day) was observed. Energy use patterns vary due to climate and different prevalence of energy types for heating/cooling in each State.

Table 6. Average daily energy consumption pre and post appointment date (kWh)

	Av. Daily Energy Use (kWh)		
	NSW	QLD	VIC
Pre-Appointment	33.7	24.9	20.5
Post-Appointment	33.5	22.4	19.2
% Average Daily Energy Use Reduction	0.6%	10%	6.3%

Data was also analysed for the subset of the 40 interview households and shows that the small interview sample does not match this pattern. For most households interviewed, average daily energy consumption saw little change post the intervention (see Appendix 1). Interestingly, household energy use pre COVID in both States is lower than during COVID. This large difference, especially in NSW, is not seen in the complete dataset and appears to be a quirk of the interview sample.

While Table 6 shows the average reduction in daily energy use for the whole sample of households, Table 7 shows the median reduction, as well as the largest decreases and increases in energy use among households by State. Overall, the median reduction in energy use sat between 0.7 kWh/day (Victoria) to 2 kWh/day (NSW), or 7.6% reduction in daily energy use. The largest reductions seen by an individual household was around 60kWh/day in each State.

Table 7. Energy change post intervention date

	NSW	QLD	VIC
Median Energy Change (kWh/day)	-2.0	-1.0	-0.7
Median % Energy Change	-7.6%	-4.4%	-5.7%
Largest Energy Reduction (kWh/day)	-62.0	-68.5	-58.5
Largest Energy Increase (kWh/day)	100.4	59.2	37.1

Figure 3 shows the distribution of these changes for each State and shows a dominant spike around the median for each State with a relatively even distribution either side of the spike. While between 17-27% of households (varied across States) did not receive any change in energy use post intervention, between 56-61% of households (varied across States) reduced their energy use. Taken together, around three-quarters or more of householders either reduced energy use or had no change following the Energy Efficiency Service, meaning that the service had a mainly positive (for over half of the cohort) or benign effect.

Figure 3. Daily energy change post intervention distribution

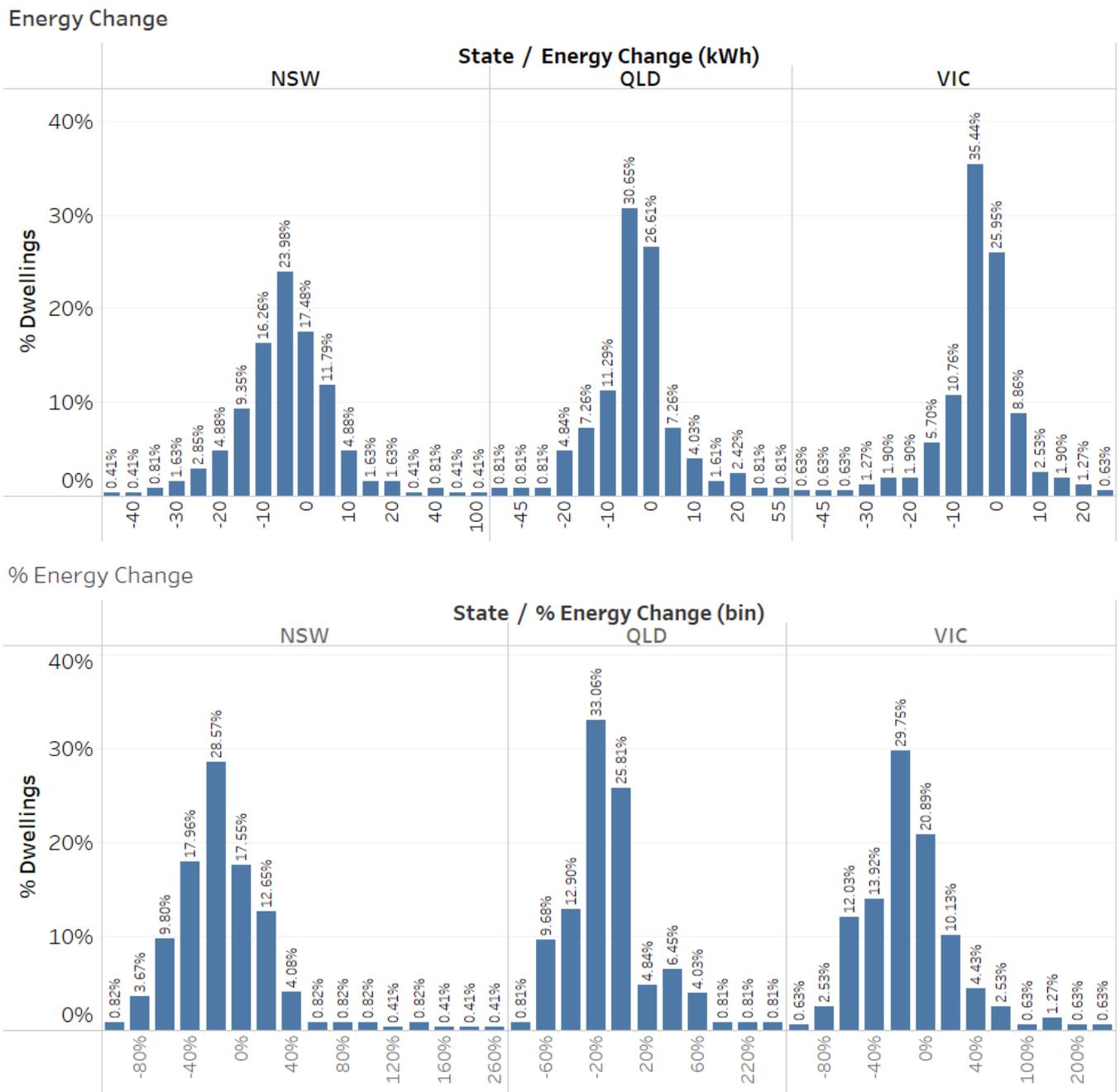
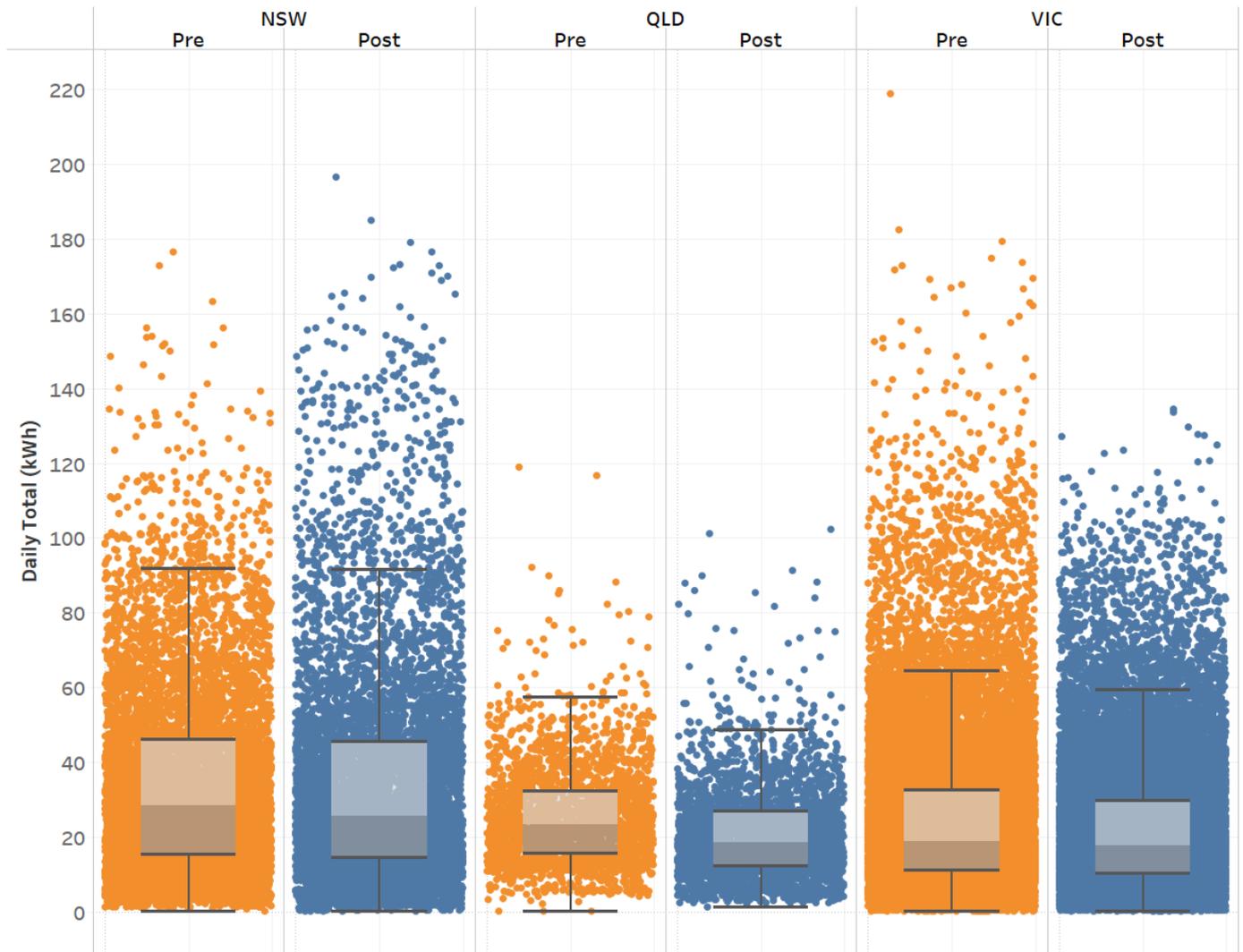


Figure 4 is a box and whisker scatter plot for each daily consumption value for each house, both pre and post the intervention date. It is interesting to note the change in the scatter pattern, particularly in NSW and Victoria, for those homes that showed well above average consumption. Victorian homes show a tightening of this upper grouping with no home exceeding 135kWh/day after the intervention. This might indicate that those households that had very high energy use benefitted the most from the appointment and were able to reduce their consumption. However, in NSW we see the opposite happening. After the intervention we see a greater proportion of data points with the very high consumption values. Unfortunately, there is no data to further explain this.

Figure 4. Daily energy consumption pre and post appointment date (kWh)



Decreased energy costs

Billing cost data was also analysed across the total sample of householder energy data (n=847). The overall amount that a household is charged generally consists of a range of costs, including peak and off-peak energy consumption as well as a fixed daily supply charge. Many households will also receive various discounts, concessions, and rebates to lower their costs and households with PV may receive credits for energy that they have fed back into the grid. Combining all the costs, discounts, rebates, and credits together allows the actual cost charged to be determined. Like the energy consumption data, this cost can be converted into an average daily cost to allow comparison.

Given that part of the Uniting Energy Efficiency Service focuses on assessing the energy deal of each household, recommending cheaper deals, and supporting households to access all concessions, grants, and rebates for which they are eligible, then it is expected that an outcome of service may be reduced energy costs through this means, as well as reduced energy consumption.

Table 8 lists the daily average costs for each State both pre and post the intervention appointment date. As seen in 7, where a reduction in energy use was observed, a reduction in costs is also observed. For houses without a PV system, there is a 21.2% reduction in NSW, 9.3% in Queensland and 12.0% in Victoria. As would be expected, homes with PV installed see a lower average cost than homes without PV, although caution is warranted with these differences due to the low number of homes in the study that had PV. However, it is important to note that alongside reduced energy consumption or increased access of cheaper energy deals and rebates/concessions, changes in average energy costs might also be due to changes in retail prices.

Table 8. Average daily total charge pre and post appointment date

Appointment Date	NSW		QLD		VIC	
	No PV	PV	No PV	PV	No PV	PV
Pre	\$7.07	\$7.03	\$5.48	\$3.64	\$5.24	\$5.00
Post	\$5.57	\$4.57	\$4.97	\$3.62	\$4.61	\$4.13
% Reduction in Average Daily Cost	21.2%	34.9%	9.3%	0.5%	12.0%	17.4%

Below average energy use

In each of the three States, daily energy use averages in 2022 were lower than they had been in 2019 (Table 9). This analysis represents broad trends of energy use over successive years. Households across the sample received intervention at different time points in this set of years. In pre COVID 2019 the average daily energy use was 23.9kWh, while during the two main COVID years of 2020 and 2021, the daily average was 20.1kWh and 22.3kWh respectively. The 2022 data shows a daily average of 21.3kWh with variations across States likely related to differences in prevalent heating sources (such as higher use of gas in Victoria vs higher use of reverse cycle heating and cooling in NSW and QLD).

Table 9. Daily average energy use by year (kWh)

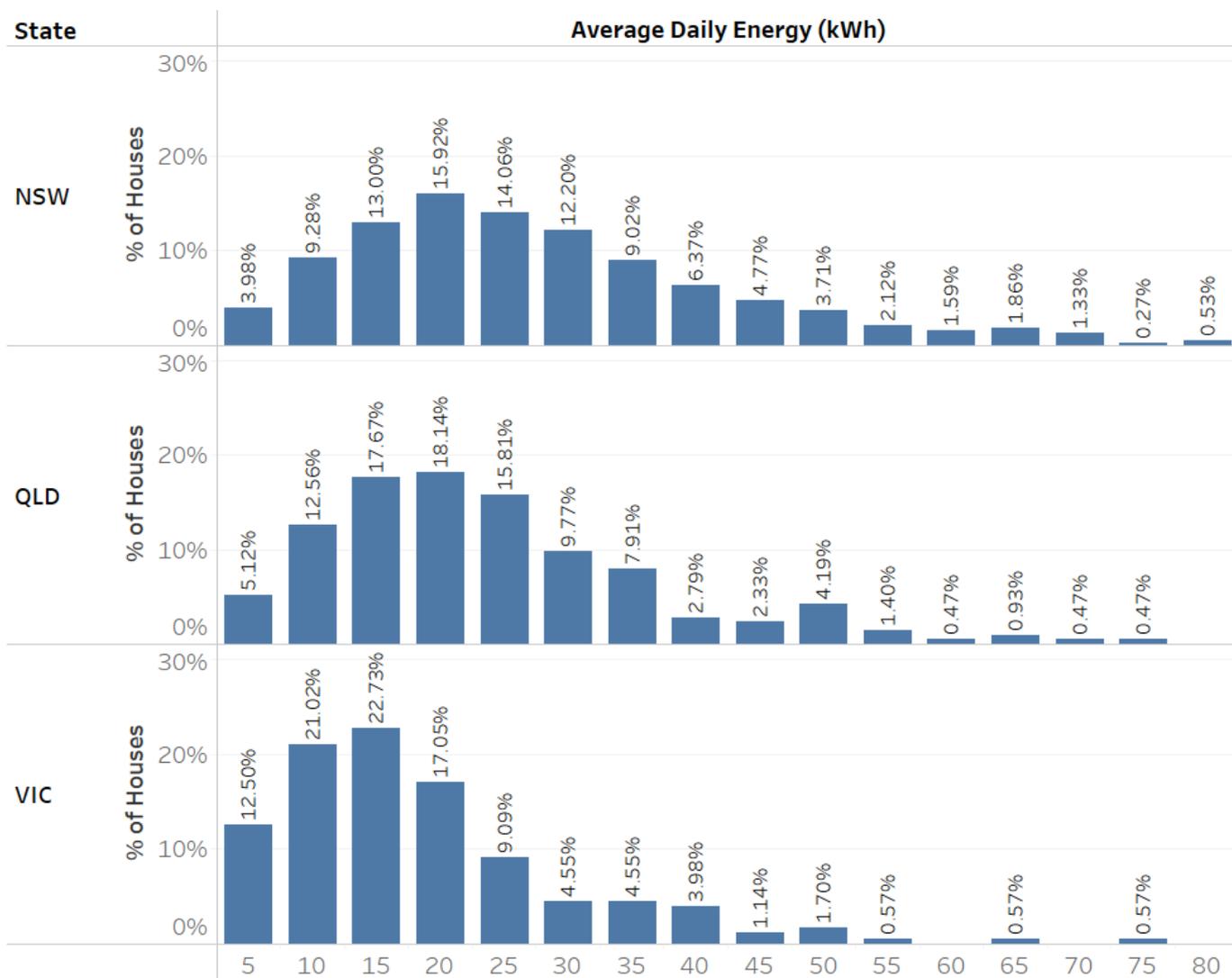
State	2019	2020	2021	2022	All Years
NSW	34.8	32.0	34.2	32.3	33.6
QLD	23.2	27.1	20.8	17.5	23.4
VIC	22.6	17.6	18.3	17.7	19.9
All States	23.9	20.1	22.3	21.3	22.2

Daily average energy use data enables an assessment of relative energy use of this cohort in comparison to average energy use of all Australian consumers. This provides data on the proportion of households in the sample who are using lower than average energy and therefore might be experiencing energy hardship.

Figure 5 shows the distribution of the average daily energy use in each State. In Victoria, 12.5% of homes use 5kWh/day or less, while it is 4.0% and 5.1% of homes in NSW and Queensland respectively. This is very low consumption and well below the Australian average of 15kWh (Frontier Economics, 2020). Such low consumption rates are concerning and potentially indicate households that are suffering energy stress. Especially considering that many of the homes in this project are old and most likely not energy efficient. 1.5kWh/day is what a typical refrigerator uses (Harrington, 2018) so assuming all homes in the study have a refrigerator, this leaves very little energy for other uses. Based on a calculation of all households using 14.9kWh/day or below, 35% of the Victorian sample use less than the Australian average of 15kWh/day, along with 18% of QLD and 14% of NSW households (excluding those households with PV). With more than a third of all Victorian households using less than the Australian daily average, it is clear that under-use rather than over-use is the substantive issue for many households.

Conversely, a smaller proportion of homes had very high daily consumption values, especially in NSW. 22.5% of NSW houses had an average daily energy use of more than 40kWh. Winter in NSW has high consumption values due to the high reliance on electricity for winter heating, so this may be leading to high overall averages for some homes.

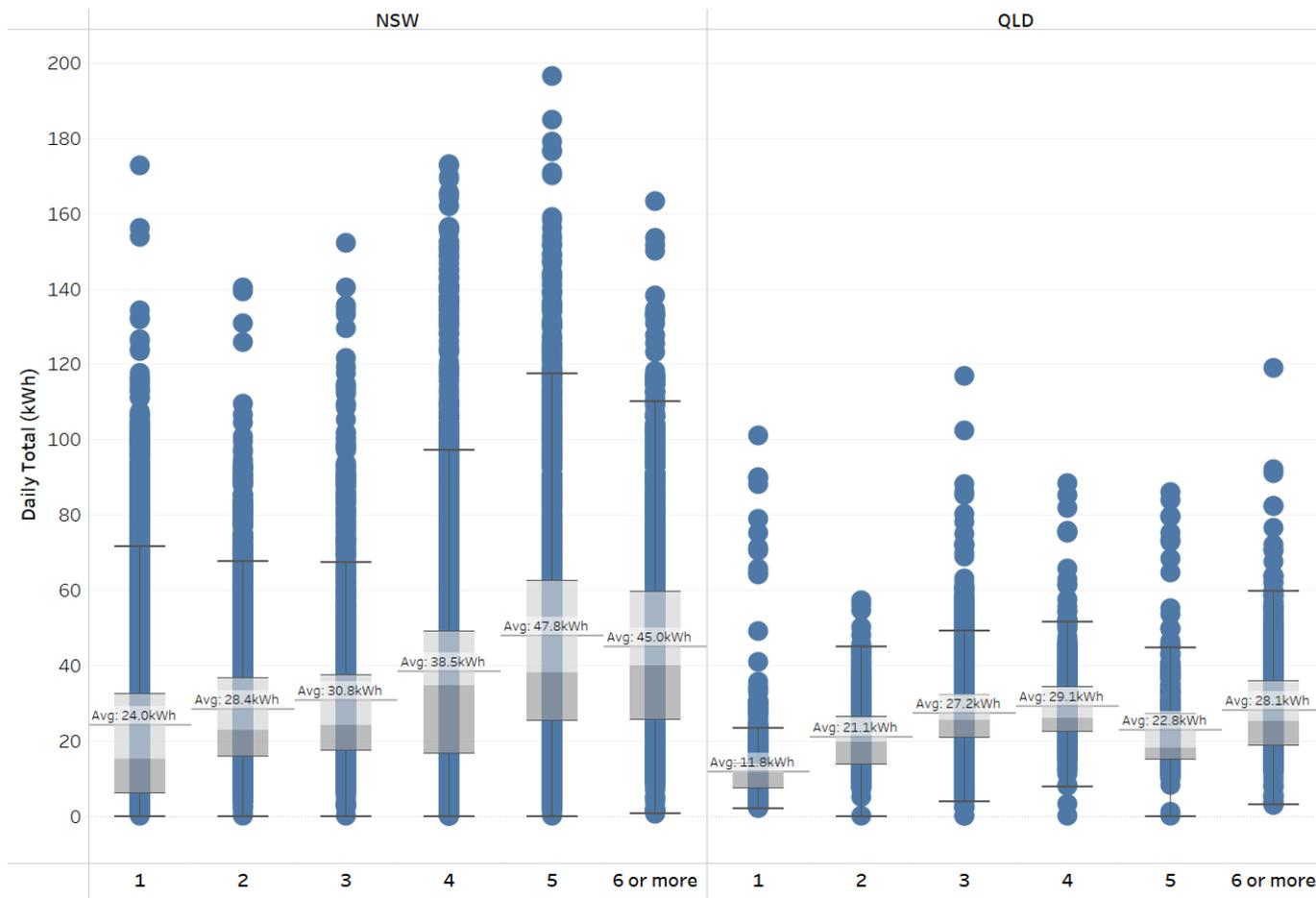
Figure 5. Average daily energy use distribution by house and State (kWh)



Occupancy energy use

Additional data was available on various characteristics of each household and analysing energy data using these characteristics can give further insights to energy consumption patterns. For example, Figure 6 shows the daily energy use of households based on the number of occupants in each household. This data was only available for NSW and Queensland homes, but shows that as household size increases, so does energy consumption. This is to be expected and not overly surprising, but it is important to note that the increase is not linear. That is, a five-person household does not consume five times the energy of a single person household. Indeed, in both States the average energy consumption only doubles between a single person household to a large household of five people. Much of the energy use is fixed regardless of how many people are in a home. Refrigeration energy is generally not impacted by occupancy number and even heating, cooling and lighting energy is often not greatly impacted. This means that energy costs often have a greater impact on single person households than on households where the cost might be able to be shared. This point is echoed in the qualitative interview data.

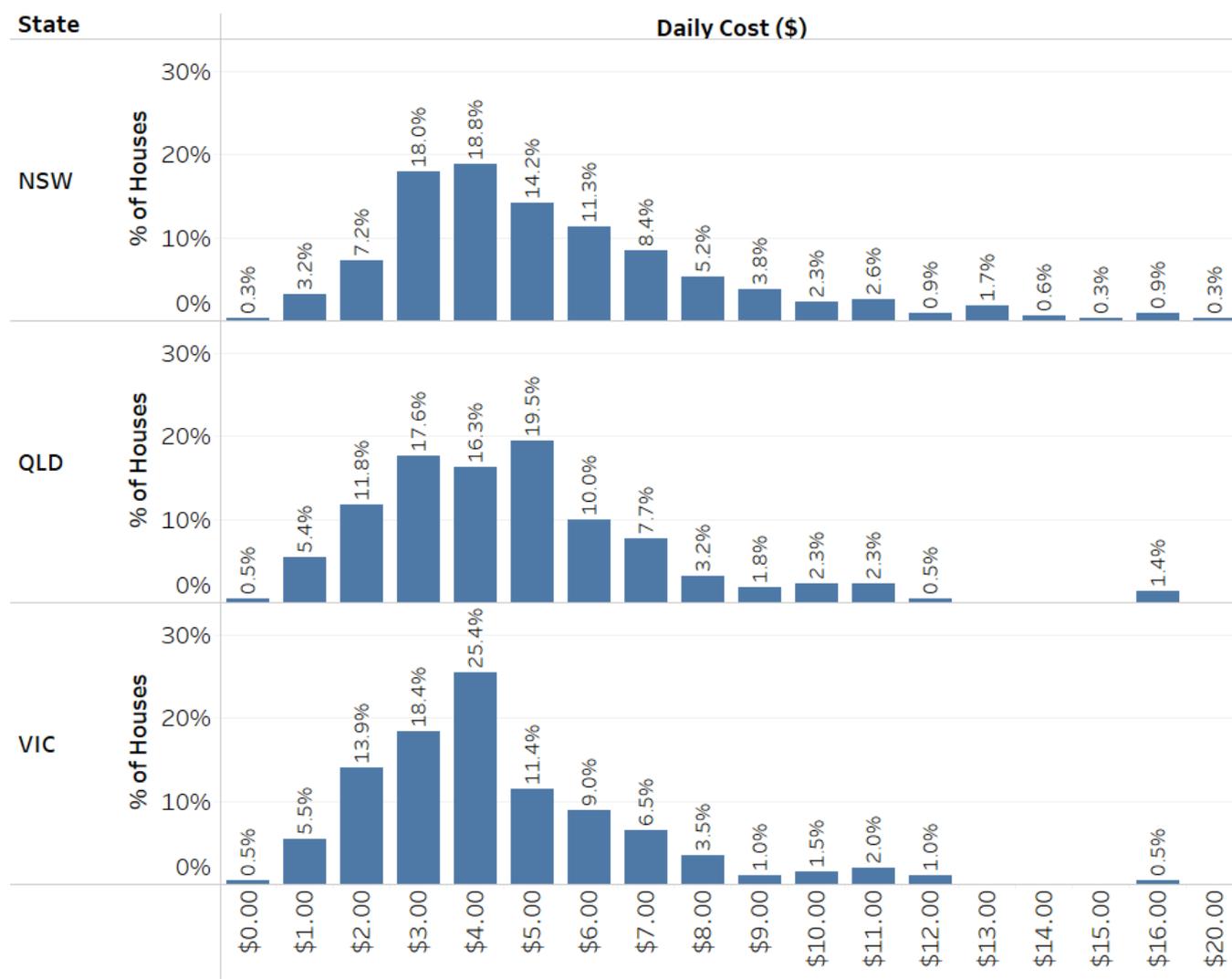
Figure 6. Daily energy use by number of occupants



Energy costs

Figure 7 is the distribution of the average daily total costs for each house by State and shows that in NSW 27% of homes had average daily costs of seven dollars or more, while in Queensland and Victoria 19% and 16% of homes respectively had costs of \$7/day or more.

Figure 7. Average daily total cost distribution by State



Energy use - interview and survey data

Improved energy management and lower energy bills

Across the forty interviews, householders provided many examples of increased knowledge about energy efficiency and managing energy choices and entitlements. Eighty-three (83%) of those who completed the outcomes survey post-interview, identified that their understanding of how to save energy around the home had gotten a lot (33%) or a bit (50%) better. Knowledge ranged from how to read bills, assess cheaper energy deals to assessing the efficiency of appliances. This was echoed in the interview data.

It was quite helpful, because he [Uniting staff] actually asked me to have a look at the stickers on each appliance, and told me exactly ... He actually broke it down to specifics and said, 'well if you can just have a look at your TV, how many watts is it?'... So he said, 'Look for this sticker and it would say this'. So he actually told me how much each appliance costs to run (Aliana, NSW, during COVID).

The phone call wasn't rushed; he [Uniting staff] was very, very thorough, where I completely understood – I didn't get off the phone feeling confused or overwhelmed. I understood everything that had been said... [And still uses tips today several years later] ... It's quite a bit [impactful], because without that information I would still be leaving

power points on; I would be having blinds open, the sun's coming in at the hottest time of the day, which you don't even think of if you're not home... The person that I got, that explained things so clear and detailed, I could just relate (Aliana, NSW, during COVID).

I made a lot of changes. It's helped me quite a lot (Post-interview survey).

Many interviewees discussed that the knowledge they had gleaned via the service had become embedded in their day to day practice.

Now that I'm aware of it, it just becomes second nature that I do all that. If I wasn't aware of it, honestly, I don't think I would have done it, but because I now know, I do it constantly. So, I'd say it has been quite beneficial for me. I would say I was a bit more confident in using the appliances. So, if there's a breeze, I'm aware of these things, whereas I don't even think I was aware of it before. It didn't even click to do these things (Aliana, NSW, during COVID).

I'm more knowledgeable and I'm implementing what I learned into practice, like the time [of day] when I am using energy and how I use it less (Alice, NSW, pre COVID).

One person explained the outcome as an empowering one:

I felt like our electricity had gone down, so it actually gave me a positive outcome because I was sort of finding my own solutions as well. So instead of someone telling me what to do, it was making me think, 'Well, hang on. This is what I can do as well', so yeah. Just like counselling, it empowered me type of thing (Montana, Vic, during COVID).

While the majority of interviewees readily remembered the service and reported that they continued to use energy efficiency strategies (such as turning off lights etc.), interviewees suggested that these strategies alone rarely appeared to have a significant effect on energy consumption and bills, though slight decreases in bills were reported. This is consistent with the analysis of quantitative energy data reported above. Those who reported more substantial changes in energy consumption often attributed this to replacement of key appliances such as fridges and freezers, or ceasing use of some appliances.

In many instances, a lack of energy reduction outcomes may be related to existing energy under-use (as suggested by the quantitative energy data showing a significant proportion of the sample were using less than the national average). Many interviewees reported that they were already using behaviours of extreme rationing of household energy. However, while the householder may be able to stoically cope with such deprivation, several also noted that they could not reasonably ask this of family members with special needs such as disability, health conditions or small children.

What I have done since then of course is I've reduced the use the of the central heating in the house and I'm focusing just on isolating myself in the kitchen- television area with one simple gas radiator heater and ... What I'm hoping is that my frugal effort to keep away from the central heating side of the heating will reduce my electricity consumption... the mere fact that I don't enter probably four fifths of the rooms in the house simply because it gets cold ... It's limiting my ability to enjoy the house. ... if people can't afford to keep their homes warm or for that matter, isolate themselves like I've had to do in virtually just one area of the home, well, that's not living, is it?... The disappointing thing for me is that when I do have guests in the house, like my children and my grandchildren, it's usually over a weekend, and over that weekend, I've really got to run the central heating virtually all day. If I don't, they won't come back and visit me during the winter. It just gets too cold (Ryan, NSW, during COVID).

I try to not use [appliances]– like say summertime, I try not to put the air conditioner on unless I've really got to. Say if my daughter comes over with the grandkids which are only very tiny and it's just too unbearable for them, then I'll put it on ... but other than that we just use a floor fan... A lot of times I need to put it on as well because I had a stroke and sometimes I need it for my own comfort as well (Teagan, NSW, during COVID).

Many interviewees reported substantial use of strategies to minimize energy use, even before the Uniting service.

I used to do three loads of washing in a 10-kilo machine a day. I now don't wash – the nights my husband goes to work he takes my washing and puts it through the work machine...I've only allowed one fan in the house and that's for my disabled child. He's the only one that's allowed a fan. No one else has any fans. If it's a really hot night we allow a ceiling fan, everyone can lay under it in the lounge room, otherwise, no, tough luck. I make the little kids share the bath. I only cook at night-time... I've tried everything I can to cut [energy]... I've turned the chest freezer off, I don't even use any power. ... I've actually had the power switched off from two of the rooms, got no power in them. We've actually had the whole lot, the lights, everything turned off so that there's no power going into those rooms at all ... Our pantry, which had my chest freezer and my appliances in, we took all the power out of that room. ... I've got no power in my bathroom. ... [Uniting] said, 'For the amount of people in your house you actually don't use that much power' ... [Also cut back on other areas of life] no entertainment, no extras, no celebrations, nothing (Lily, NSW, pre COVID).

Like Lily, other consumers also reported re-organising their energy use to only use main appliances like washing machines, hot water systems, stove/oven at night during off peak, cheaper energy periods. In some cases, interviewees ensured that any new energy efficiency appliances that were purchased had timers to automate use during the 'wee hours of the morning when the cost wasn't as much' (Nicole, NSW, during Covid).

In most instances of extreme energy rationing, consumers reported little effect on their bill.

Basically did as much as I could around the home to cut back on electricity use... In summer, it'd get quite hot because it'd get up to 42 degrees in a tiny little place, so that was a bit of a shit, because we weren't wanting to use the air conditioner, not with a \$3,000 bill coming in, it wasn't worth it. There was nothing else to cut down on, to the point we stopped using the stove at the point, because it was electric as well. ... [We] made as many changes as we could; we couldn't make any more changes anymore. And they were still coming in at the same high rate price anyway (Stacy, NSW, pre COVID).

Overall, in situations where energy use was already tightly rationed, there was little capacity for further reduction. This tallies with the quantitative analysis of energy data that shows that a proportion of households are using well below the national average in energy consumption and are likely already experiencing energy deprivation.

They [Uniting] try [to be helpful] but it's not – you can't really save when there's nowhere to save at least they reassured me that we were doing the right things (Lily, NSW, pre COVID).

Other impacts of service - Non-energy benefits

While the Uniting service had outcomes related to energy, the data reveals that there are also other non-energy benefits. These include financial benefits, psychosocial benefits, and increased access to services.

Financial benefits

A benefit frequently talked about by interviewees was that of decreased financial stress. Householders responding to the post-interview survey reported outcomes in relation to reduced financial worry, with 67% reporting that their worry had reduced (50% noting this was a lot better).

Uniting were wonderful. I had one meeting with them and they assisted me towards both bills [gas and electricity] that were outstanding... they were paying part of the bill. I thought at the time they were going to be about \$200 on each for that quarter, but in Uniting's case, they were able to double that for me. That was a great contribution. That took a lot of pressure off me (Ryan, NSW, during COVID).

Some householders reported now being able to identify and access relevant financial assistance such as rebates and grants, where these were previously unknown to them. Sixty-seven percent (67%) of those completing the post-interview survey reported that their understanding of government supports and concessions got a lot (50%) or a bit (17%) better.

Just going through it all, just helping out. Because I've never used any of them before, like the grants or anything like that. I wasn't aware I was entitled to it because I don't go looking for it anyway. But now I just look on the Vic Gov website, it's there (Lachlan, VIC, during COVID).

Mechanisms like access to rebates and grants, and other mechanisms such as ensuring all relevant concessions were being activated, made a material difference in addressing accrued debt. Given that in many cases only minimal levels of energy reduction were likely to be attained, as substantial energy rationing was already in place, debt payment mechanisms were of critical importance in changing the household's hardship experience. 'Paying the amount owing' was identified as an important 'other' outcome by one respondent on the survey, and the access to the EAPA vouchers was the 'main thing' that Uniting did that contributed to desired outcomes.

They [government grants] probably helped me for a full six months, before the bills started to crank up again (Bradley, VIC, pre COVID).

While in many cases, interviewees were experiencing ongoing financial stress, in some cases the intervention to address the energy debt enabled householders to better manage other bills and debts. Fifty percent (50%) of survey respondents reported improvements in knowing how to manage their money. This was further explained in the interview data.

It made life a lot easier for me. And everything else was a lot more manageable (Samantha, VIC, during Covid).

So they [Uniting] just relieved that so I could pay other stuff off. I got on top of everything at the time. It's nearly two years since then. I got on top of everything. I was able to get on top of the water, get all my rates paid up ... Pretty much straight away it started helping because I stopped stressing about the power bill and I was able to just concentrate on the next bill, whatever it was (Lachlan, VIC, during COVID).

Increased confidence to engage with energy retailers

Another outcome area investigated by this research was householders' increased confidence to engage with energy retailers. Again, this is a complex picture as most interviewees had substantial histories of

engagement with energy retailers and lengthy experience of energy hardship. However, some interviewees did highlight outcomes in relation to their own expanded confidence and capacity to understand energy choices and to negotiate with energy retailers independent of other support. Fifty percent (50%) of householders who completed the post-interview survey reported increases in understanding of the support available from energy retailers, with 50% also reporting increased confidence to speak up and ask for help (though one person said their confidence to do so had gotten worse).

Once they [Uniting] were able to physically go through it [the bill] with me, I certainly learnt a lot... so I've moved in with my partner, even into the last couple of units, [my knowledge] helped us both manage and get on top of things really quickly and really easily. And even being confident about calling the energy companies as well... even if they tell me - the energy company told me something, like random to understand, and if not I can ask the relevant questions to make sure I do understand it as well... I think that education that I did have [via Uniting], that did help (Venessa, VIC, pre COVID).

Psychosocial benefits

When participants were asked to enumerate the benefits, they received from the program, 27 out of 40 participants (68%) reported that the visit by staff was helpful for them in different ways. These psychosocial benefits included providing assurance, building confidence, and easing stress.

Interviewees indicated that high energy bills were stressful and led to anxiety and depression.

I kept stressing at that point... [If I didn't have to worry about energy bills] it would take much weight off my shoulders. At the moment, I feel like there still is a fair amount of weight on my shoulders (Brayden, VIC, pre Covid).

It's almost like torture. You're thinking, God, I'd better turn the heater off because it's costing me money...that is the mentality being drummed into us ... every now and then I'd look at it [the energy bill] and then I'd start getting the shakes and the sweats... god, the frustration and the sleep lost over those sorts of things is woeful. Absolutely dreadful (Chloe, VIC, during COVID).

The Uniting service reduced stress and anxiety, and offered a more positive outlook.

One of my problems is with depression. I can get so down in the depression. And with money, - it looks like it's never-ending. And it just gets you down and you just don't want to face it type thing. With having part of the debt [due to accessing a government grant]- not all the debt - but part of the debt paid off, it just gave me that extra oomph to - well, I'm nearly there type thing... Actually, it helped me mentally (Montana, VIC, during COVID).

But Uniting were very good, they assisted me emotionally ... by the time I left I felt a lot more positive (Nicole, NSW, during COVID).

Interviewees reported that their interaction with Uniting staff helped to reduce their stress and worry. One householder noted that they were not 'stressed out as much' (Samantha, VIC, during COVID) after they started to talk to Uniting staff. Another reported that 'all the help [they received made them] a lot calmer' (Ben, Vic, during Covid).

Some householders reported that the visit by Uniting staff boosted their confidence by assuring them that someone cares about what they are going through, and that help is available when needed.

[Uniting staff were] very caring and very good at what they do, and I know in the future – when people are struggling and that, they’ll be able to help them get through the harsh winters, and even through the harsher summers with the power and that. So, they’ll help other people in the future when they need some help with their bills (Molly, VIC, pre COVID).

This notion of feeling reassured by the services, information received, and the approach used was reiterated by several interviewees.

*They [Uniting] reassured me that we were doing the right things (Lily, NSW, pre COVID).
...they [Uniting] weren’t judgmental or anything. They weren’t, ‘Oh, yeah, here we go again, this is another person that needs help’. They were quite good and to the point that I think I was actually crying when they gave me some assistance (Nicole, NSW, during COVID).*

One person noted that they felt that the service was something they can ‘fall back on even though the electricity is scary...I think it’s a good backstop that I’ve always got there’ (Carrie, NSW, pre Covid). This feeling of underpinning and available support was also referenced by others:

Uniting was great because they said, ‘You’ll get this help all the time’ (Ben, VIC, during COVID).

I think it would help lots of people just to say that someone is there to give them a hand if they need them (Alice, NSW, pre COVID).

Some householders also felt that their interaction with retailers was reassuring, and it gave them confidence that the retailer was willing to help them if needed. For instance, one person reported that their retailer told them,

‘You’ve been with us quite a while, and we’ve never had a problem with you’. ... I thought that was nice to know. And he was quite good. As he said, if anything happens and I can’t cope with that amount, to get in touch with them immediately, and they’ll return to the original (Nicole, NSW, during COVID).

Such a sentiment was also extended to other services:

When I went for the Cost-of-Living thing [via a community service], I walked out of there feeling good because I felt like someone cared about pensioners and was guiding us on the right road. they make you feel comfortable even though you’re feeling very uncomfortable when you go in and have to ask for help. By the time you walk out, you’re feeling quite reassured (Nicole, NSW, during COVID).

As described earlier, the vast majority of interviewees narrated long histories of hardship and energy billing issues. Despite their best efforts, householders had not been able to bring the spiraling cost of energy use under control. For these individuals, the Uniting service represented a port in a storm.

Just being able to access that [Uniting service] - if it wasn't for that I don't even know where I would be to get my electricity bill down (Allanah, NSW, during COVID).

It [the Uniting service] was just a lifeline when I really, really needed it... it didn’t cost me anything, and it was just such a relief (Carrie, NSW, pre COVID).

Overall, participants felt that the visit paid to them by Uniting staff had value beyond helping them reduce their electricity bill or providing them with some tips to conserve energy. The interaction with

Uniting staff was 'important' to participants as they saw it as a way of connecting to someone or knowing that someone else cared about their hardship. It provided the assurance they needed to know that help was available, built their confidence for the future and reduced their stress and anxiety.

Access to services

While interviewees reported already high engagement with a range of services across the trajectory of personal and energy hardship, some noted the value of the Uniting service in connecting them to other services. Eighty-three percent (83%) of those completing the post-interview survey reported that their access to services got better (with 33% feeling it got a lot better) following the Uniting service. Several interviewees commented on the provision of new information about services by Uniting.

...they were so helpful and so understanding [and offered food and other vouchers] (Ryan, NSW, during COVID).

... and there's lots of information, like other support services, and no interest loan schemes. ...he's given me things like the New South Wales Debt Hotline, the eco vouchers, he's listed every support service that I could be able to access if I need it (Carrie, NSW, pre COVID).

Valued elements of the support provided by the Uniting Energy Efficiency Service and ways to improve the service

Overwhelmingly, interviewees reported positive experiences from engagement with the Uniting Energy Efficiency Service.

I think it was phenomenal, I would literally recommend it to anybody... it's something I'll always keep [the written notes and information] and refer back to because there's things in there that are just really helpful (Carrie, NSW, pre COVID).

But as far as whatever Uniting did, they did everything and more, really, with helping with everything with the house electricity bill and everything. They made the biggest input. ...they were telling the electricity company, 'This is all you're getting and this is what you're going to have to do until they get back on their feet' (Ben, VIC, during COVID).

[This was] the first time I've ever had any assistance with energy bills. I didn't know what to expect and I was pleasantly surprised... I couldn't be more satisfied. No, I don't think they could [improve] (Ryan, NSW, during COVID).

Interviewees repeatedly discussed valued elements of the program, explored below. In the main, suggestions for improvement sought to enhance or sustain these.

Non-judgemental, genuine approach

The approach used by Uniting was one of deep understanding of the circumstances of householders which accepted rather than judged the issues householders presented with. This theme was consistently repeated across the interviews, with householders commenting on how comfortable they were made to feel, where the discussion was knowledgeable and informed as well as compassionate and showing genuine care for the person.

I found it ... belittling to me that I had to go and ask for help ... They weren't judgmental or anything. ... they're genuine, the genuineness, their realism, they make you feel comfortable even though you're feeling very uncomfortable when you go in and have to ask for help (Nicole, NSW, during COVID).

I didn't feel judged by him [Uniting staff]... It just felt like – I don't know what the word is, but it just felt natural, having that conversation (Aliana, NSW, during COVID).

I think they were very understanding and they were very compassionate (Ryan, NSW, during COVID).

Support that was not time limited

While the model of the Uniting service is based on a single, main touch point, some householders reported either being offered follow up or receiving a follow up call or visit. Some were reassured by the option to re-connect with the service if needed.

They were so helpful. The lady [from Uniting] came over and she made sure - she said she wouldn't leave until I understood everything completely, and to call them back if I had any questions (Bradley, VIC, pre-COVID).

Despite the assurance of follow up in some cases, very few people reported that they had received follow up from the Uniting service. Those who did valued it, and those who didn't frequently suggested that this would be a beneficial addition to the service.

I was really happy with them [Uniting]. The lady was wonderful, friendly, great approach. There was no other better thing that I could have wished for from them except maybe if there was – it was available maybe once a year, just a phone call and just 'Oh let me check that for you. Yeah. I think you could do better with this,' just like a little follow up (Alice, NSW, pre COVID).

A follow up call would be helpful – rather than leave it the person to make a repeat call if needed because people lose the number or get busy (Aliana, NSW, during COVID).

[A] semi regular check in would be good [every 3-4 months] (Brock, NSW, during COVID).

Not surprisingly, several people mentioned accessing the Energy Efficiency Service several times, often in different housing. Given that being a renter is a factor that is predictive of energy hardship, it is not surprising that householders reported different energy issues in different housing, requiring support.

I think a little bit more engagement after the appointment as well, so it wasn't left in the lurch. And I guess coming up with different tips and ideas and that sort of stuff about what to do next or what to look at if having to move or anything like that as well (Venessa, VIC, pre COVID).

Resources to aid retention of energy efficiency knowledge and strategies

Several householders commented on the value of the information and energy efficiency tips, and wanted this information captured and provided in a more permanent form, such as a booklet or video. One person wanted a small booklet with the power usage of common appliances. Another sought wider information:

Probably the information book with the calculations and the math with the energy, just so I could really permanently understand it. I was writing it down, but my writing is pretty messy. Even like a video... that runs over the bill, how to calculate it, budget. Just a short one, like not a long one, just something that gets to the point, maybe with some animation to keep people interested... Probably a little quiz as well, so after you watch the video, like a little quiz, just to cement the information (Bradley, VIC, Pre COVID).

This kind of suggestion highlights how seriously many householders approached the task of learning how to best manage their energy choices and usage. Several discussed returning to notes they had taken

to brush up on information and some remembered receiving hard copy information in the mail as a follow up, which they found useful.

... the last page of the information he [Uniting staff member] sent me was like pictures of appliances to use instead of [low efficiency appliances]– it was like pedestal fans (Carrie, NSW, pre COVID).

More widely available

As discussed above, interviewees greatly valued the Uniting Energy Efficiency Service, along with supports they received from energy retailers and other community services providers. These supports were the key mechanism to reducing debt and enabling adequate energy use for comfort.

I think that this should be made [more] available – I don't know that many people know about it. I didn't know about it when they [energy retailer] referred me to them, I'd never heard of it. I thought it would be that I paid a fee, and I didn't realise it was free. I think it needs to be more widely accessible for more people because there are so many people – like my elderly friend, she lives in a Department of Housing unit, she just sits there in the dark because she doesn't want to put the lights on.... [or] put the heater on (Carrie, NSW, pre COVID).

As Carrie goes on to explain, currently there is an element of 'luck' in accessing support, rather than clear mechanisms in place to ensure that all those likely to need support are given direct access to it.

I feel very lucky that I was offered that opportunity to speak to Uniting, but I think the thing is, I feel – and I don't know why it is, it's not widely publicised, or it's not offered, I don't know why more people aren't given the opportunity to speak to somebody, especially with the economy at the moment with the prices of energy going up. I think more people need more education on ways to save money with regards to electricity... But I think some people are either just trying, like my friend is, to go without, and she's nearly 80 years old, and it's unfair because if more people were offered the opportunity to speak to somebody that could say, 'No, you can cook a meal, you can turn a light on'... I just think that if you kept it plain and simple in the information like [Uniting staff member's] information that he sent to me, then more people, I think, would benefit from it (Carrie, NSW, pre COVID).

Support that would have helped: gaps to engendering long term solutions for householders

Given that householders were largely taking every action available to them to reduce energy consumption, their suggestions for the provision of relevant supports (other than the Uniting Energy Efficiency Service) focused largely on the macro and meso levels of the ecosystem, to bring about substantial and sustainable change.

Interviewees' strategies sought ways to better embed mechanisms to ensure households were provided the cheapest energy available, access to financial relief entitlements and information to support energy efficiency strategies. Additionally, they identified the need to improve housing quality and enable retrofitting and upgrades. Many of these solutions were felt to be the role of energy retailers.

Put succinctly, these strategies all seek to make payment of energy bills attainable.

I just wanted somebody to help me pay the bill, that's all (Ally, NSW, pre COVID).

Ensure households are provided with all bill reduction entitlements, cheap energy deals and energy efficiency information

Throughout the data are stories of householders finding out about various forms of financial assistance (concessions, grants, rebates) in relation to their energy use. Many commented on their previous lack of knowledge of these and consequently a strong theme for change was the development of mechanisms to ensure all energy consumers were informed about potential bill reduction and payment entitlements.

People should be made more aware of what's out there to help them [concessions and grants]. Instead of, like some of these old people, they struggle and basically some of them came to the choice of either eating or paying their power bills. And they weren't aware that there was help out there because [energy retailers] and all these places don't make it aware....the actual energy providers don't sell them very well. I think they need to care about their clientele a bit more because, without the clientele, they wouldn't have a job (Annalise, VIC, during COVID).

Like Annalise, many interviewees placed the responsibility for this information management with energy retailers, noting that this is an area they are not undertaking well.

[What could the energy retailer do differently?] Listen. I don't believe they listen completely. Ask more about your personal situation. Not once did they ask me if anything personal had happened to me to make it harder to pay bills at the time.... not once did [the energy retailer] suggest that [Energy Relief Grant]. You just think, 'No, they just want you to struggle' (Annalise, VIC, during COVID).

A range of strategies were suggested for active, mass communication to energy customers about these support options and entitlements.

The companies [energy retailers] should ...send out pamphlets to people with their bills [about grants and relief etc.] (Jessica, VIC, pre COVID).

Additionally, interviewees suggested that energy retailers should be more proactive in monitoring for potential hardship and then providing relevant information about financial relief. This might include monitoring for unusual rises in energy use or billing.

I do believe that these energy companies should have some system in place where a red flag would alert them to the fact that a bill has gone from \$500 a quarter to \$950 a quarter. Why? And have one of their officers ring to discuss the matter with the client. After all, we are clients of that energy company (Ryan, NSW, during COVID).

Keeping abreast of the cheapest energy offers was considered very difficult by many householders, either because of the complexity of the bill or due to the many commitments or issues they are juggling in life.

You need to go to college to learn how to read your bill! Or to understand it at least... And then they send you an email changing things, and you think, well, I didn't know what it was in the first place. I can't understand it (Summer, NSW, pre COVID).

As a result, interviewees suggested a regular mechanism of automated review of the energy price charged each household:

If someone was able to just find the best one [energy deal]. The [price comparison] thing they advertise all the time, it's all bullshit. I tried that. It's not what they say it is. So if someone was to call up, I don't know, once a year and just check up and just say, 'Hey,

how are you going? ... we just came up with this [deal]' Instead of me doing all this research – and they knew better ...It would be a huge help (Alice, NSW, pre COVID).

Energy retailers should also be more proactive in supporting householders to understand and monitor their energy use. One interviewee highlighted that a potential benefit of this would be greater consumer empowerment to select the best energy retailer, which would drive competition among retailers.

If they [energy retailers] had also the videos like that to explain energy consumption. Honestly, all the energy companies should have a little guide for people, especially going through hardship, on how to track the energy... f you could make it, like an app, ... just to make it an exciting thing to track, just like how people track their steps every day with an Apple Watch and all of that. ... It will be a good way to keep competition amongst the other energy companies as well, because they've all got different prices and stuff. They [householders] could compare their daily energy consumption, depending on their demographic and what household theirs is, whether it's a single household, or a two person (Bradley, VIC, pre COVID).

Another interviewee also felt that the responsibility for education regarding energy efficiency tips lay with energy retailers and that this should be improved.

If they [energy retailers] had stand-up pods [in shopping centres], like they do when they're selling their electricity or when they want you to change company, they have people that are ultra-friendly and chatty, and pull you over to let you change your electric company... But if when the next time I went to the shopping centre someone like that was there, and said, 'hey, how's it going? Can we help you with anything? Do you need to understand your bill?' That would be amazing. But that's never going to happen, ... But for me, as an older Australian, I think that would be a fantastic idea. Somewhere where you could actually go and talk to someone and get help to understand your bills, and what you're paying, and what – where you should be – what you should change, what you shouldn't change (Summer, NSW, pre COVID).

Increase discounts and rebates available to low income households

Interviewees offered a range of suggestions as ways to better target discounting of energy costs. In the main, these suggestions were aimed at energy retailers. Several people suggested focusing on specific groups like pensioners- where existing concessions were seen to be inadequate, or single people – where there are no current discounts to offset the difficulty of covering fixed and usage charges on a single income.

Other interviewees suggested periodic, ad hoc discounts and debt waivers. While payment plans assist in managing payments they do not address accumulated debt or high bills, and waiving even a portion of the bill was considered to be of assistance. One person drew on her experience with telephone companies who sometimes offer bill reduction:

Maybe they [energy retailers] should give some help like going, 'Okay, how about we'll help reduce some of the bill?', like they take some of the cost off the bill. Sometimes phone companies, when things are tough, they go, 'Well okay, we'll reduce your bill and we'll take \$200 off the bill' or something, but they [energy retailers] won't do that. They don't give you any grace. They won't do that, like they make millions and millions of dollars and they won't give you any grace. They want every last cent. They don't care (Samantha, VIC, during COVID).

Other interviewees hoped for debt cancellation, where the whole debt is removed and the consumer can ‘start again’.

But there's no such thing as just squashing it and then start again fresh (Alexis, NSW, during COVID).

The circumstances of some consumers meant that they had accrued debt through no fault of their own (for example, in meeting tenancy obligations to run energy inefficient equipment) or had inherited debt (for example from ex-partners who had left them with debt). Debt cancellation in these circumstances was felt to be particularly warranted.

Incentivise off peak energy use and low consumption

One way that interviewees identified to assist householders to manage energy bills in an environment of high energy prices, is to extend off peak energy either by making it cheaper or extending the hours of its availability. As described by one consumer, staying up late and re-orienting energy using activities such as clothes washing to take advantage of off peak energy prices is a burden for householders. To encourage people to change habits, off peak energy should be cheaper as an incentive.

Because we mainly do everything at night, so we'd like the off peak to actually be beneficial. You do everything at night thinking you're saving ...like you're staying up to get all this stuff done... [so the energy should] be even more cheaper because you're up at [at late hour] (Lily, NSW, pre COVID).

Similarly, householders felt that their frugal and highly rationed energy use should receive a financial bonus. A discount might be applied to households that showed a lower than average energy use per head.

Give a genuine discount to those that are doing the right thing (Lily, NSW, pre COVID).

Information and financial support to do energy efficient retrofits and appliance upgrades

Not surprisingly, given so many households blamed their energy hardship on poor quality housing, many interviewees suggested strategies targeting increasing the energy efficiency of housing and appliances.

Many householders discussed the benefits of solar power, and some had been able to install solar systems in their home, usually with the assistance of government grants. A key suggestion in this regard was to increase financial support for solar installation given it is otherwise not affordable.

I just can't afford the outlay [to install solar] even with the government incentives, it's just not feasible at the moment that's for sure. I do try to keep up with the times, and I realise all these things are good for the environment and I want to do that (Carrie, NSW, pre COVID).

Other interviewees recognized additional barriers to solar access, including the nature of the dwelling and the landlord. One person sought innovative strategies to support apartment dwellers to access the benefits of cheaper solar powered energy:

... if you're living in an apartment, that's [installation] not possible.... [Instead, it would be good to have] something that you could run all your appliances off, like from the rechargeable battery. I'm not sure if that's even a thing at the moment... more alternative devices, even though solar's really just the main thing, or rechargeable batteries that you can charge up with the sun (Bradley, VIC, pre COVID).

Many others focused on the need for public housing to increase energy efficiency in their design and in the installed appliances. One person had requested her landlord (public housing) to install solar and had estimated a 75% saving in energy cost, but her request was denied. In response, she suggested that Public Housing should invest in energy efficiency in houses, like solar, even if only for longer term

'proven' (good track record) tenants. Additionally, changes to policy and procedures are needed to encourage and enable public housing tenants to invest in their own upgrades, with the public housing landlord to then support ongoing maintenance. Other interviewees highlighted the need for public housing to be upgraded to maximise energy efficiency more generally, including but not restricted to solar installations.

Given that upgrading to energy efficiency appliances or undertaking retrofits largely fell to the actions of householders (whether tenants or homeowners), more financial support was requested. This might take the form of more readily available No Interest Loans, 'with less restrictions' (Samantha, VIC, during COVID), or other forms of financial support including buy back schemes. Financial support is necessary for many householders to be able to invest in energy efficient appliances.

My kids keep saying, 'You need to get rid of it' [inefficient and costly appliance] and I said, 'I can't afford to get rid of it' ... financially I just can't (Teagan, NSW, during-COVID).

Discussion and key implications

Energy stress is a common problem for households in Australia. The Brotherhood of St Laurence found that between 2006 and 2020, one in five households were in energy stress, with higher levels among low income households including those with disability, and on income support (Bryant et al., 2022). In line with other studies, the current study highlights that energy hardship is not primarily caused by reckless energy consumption of households. The households in this study have been shown not to be consuming, in the main, above-average consumption levels and a sizeable portion of the households in the study are consuming energy at or below average consumption levels, with some drastically so.

Instead, energy hardship is constructed by the intersection of multiple factors across macro, meso and micro levels of the ecosystem. At the household level, most of these factors are not one's energy consumers can control. The provision of energy assistance is not the role of any single entity in the ecosystem and is currently characterized by a complex set of actors, including multiple levels of government, energy retailers, and community services, and a complex set of support types and access mechanisms.

This raises a range of implications for the design of the way energy assistance is provided. Below these are explored, first, via analysis of the implications at broader macro and meso levels of the ecosystem and secondly, via reconsidering the design of the Uniting Energy Efficiency Service as one actor within this system.

Implications for re-designing the way energy assistance is provided

Activities to increase incomes

Given that 'energy stress increases strongly as income falls' (Bryant et al., 2022, p. 14), addressing low income levels is a primary mechanism to reduce energy stress. Evidence from the period of temporary increases to rates of income support payment, during COVID-19, shows that energy stress fell by 15 percentage points among households receiving JobSeeker payments in 2020, alongside a reduction in the number of these households who reported being unable to heat their homes (falling by 5 percentage points) (Bryant et al., 2022). Consequently, increasing low incomes, especially of those on income support is a proven strategy to reduce energy stress.

While this kind of structural change in income support and the levels of low incomes is beyond the direct control of funded energy efficiency services, it should remain an area of evidence-building and advocacy given its major contribution to the construction of energy hardship.

Beyond overall rises in income support levels, energy support is also provided via targeted government supplements. Termed 'income supplement initiatives' (Bryant et al., 2022), these largely consist of usually one-off 'bonus' payment to eligible groups, paid into bank accounts of individuals (e.g., Victorian Government's 'Power Saving Bonus'). These and other mechanisms to supplement incomes of those experiencing energy stress are in need of expansion to ensure they are widely and automatically available to all those who need them.

Activities to reduce energy prices/cost (attain affordable prices)

Reduction of energy prices is significantly driven via the energy market, including via increasing the amount of renewable energy in the grid or reducing system-wide costs (Bryant et al., 2022). Similarly, at the macro level, government regulation, resourcing and subsidies can be used to replace household gas usage with widespread electrification as a mechanism to reduce energy costs for households (Bryant et al., 2022).

While structural changes such as these could support affordable prices, there is also scope for both governments and energy retailers to respond to the critical needs of low income and disadvantaged households by increased measures to reduce prices for this group.

A major strategy is to increase access to the most cost-efficient retail energy for households. Interviewees in this study sought a better mechanism to identify and access the cheapest energy plan for their household. As with other research (Bryant et al., 2022), interviewees found navigating the complex energy retail market and comparing energy prices too complicated to undertake. They sought a more automated or regularly supported mechanism to access the cheapest energy available. Data from the Australian Energy Regulator cited by Bryant et al. (2022) suggests that the difference between the lowest and highest priced energy offers is about \$1000 per annum in a householder's bill. A range of research shows that disadvantaged households, including those with limited English proficiency, those on low income, and those with limited or no internet access regularly pay above average prices for energy (Bryant et al., 2022). A range of strategies could be actioned in response to these issues and have been suggested by Bryant et al. (2022, p. 27), consistent with the findings in this current research. These include:

- Extending the application of default offers to all occupancy types and including users of gas (Bryant et al., 2022). This would mean that all households would have some minimum protections as to energy prices, including those who, for a range of reasons, lack capacity to actively select the cheapest energy available.
- Increasing retail consumer protections. Bryant et al. (2022) suggest that these protections should include requirements for energy retailers to provide the cheapest offer at all times to people in payment difficulty. Data from the current research also highlights the need to require proactive activity from energy retailers to maintain and apply concession and subsidy entitlements for all householders. Additional consumer protections include restrictions on price increases, restrictions on energy disconnections, and requirements around retailer-customer interactions (Bryant et al., 2022).

Similarly, Energy Consumers Australia (ECA) (2020) suggests the use of innovative technology to better enable identification and targeting of energy consumers needing support from retailers.

Further, the cost of energy could be reduced in relation to off-peak energy to incentivize and reward householders to access this energy type (similarly argued by ECA, 2020).

Beyond mechanisms to ensure that all low income households are guaranteed the cheapest energy price, a further strategy is to increase rebates and grants (i.e. via government) and discounts (i.e. via energy retailer) for disadvantaged households. Currently a range of concessions are offered by State and Territory governments (sometimes in partnership with the Commonwealth government) to concession card holders or eligible households. Interviewees in this study supported increasing access to these, and increasing the amount of concession offered disadvantaged groups, including 'specialised' payments to target groups such as those with a medical need for higher energy use. The use of 'specialised' or targeted payments could be expanded to other cohorts.

Activities to reduce debt/ support bill payment

Regardless of mechanisms to bring about affordable energy prices (above), effective energy support must address householder debt via 'debt reduction initiatives' (Bryant et al., 2022). These include grants to households experiencing debt (e.g., Utility Relief Grant Scheme – Vic; Energy Accounts Payment Assistance – NSW), and payment plans from energy retailers. While these have largely been the arena of government policy, householders in this study called for provision of debt relief activities by energy retailers (and funded by them, including full or partial debt waivers (in prescribed instances). Households in this study carry significant accrued debt over long periods with few mechanisms to significantly reduce this. As with previous research, this study confirms the link between household debt, energy stress and negative health and wellbeing outcomes. Further mechanisms to meaningfully reduce or waive debt are needed.

Activities to make housing more energy efficient

The quality of housing stock has been found to be a significant cause of energy consumption. There is evidence to suggest that housing utilized by low income households has lower energy efficiency than average (Bryant et al., 2022). For example, in 2018, 4% of rental properties in Australia had rooftop solar compared with 29% of owner-occupied properties (Browne & Schultz-Byard, 2021). Households who were interviewed explained that a significant cause of energy costs was the poor quality of their housing, over which they often had little control. Both private and public landlords appeared to take little action about the reported housing issues and failed to retrofit housing stock to be more energy efficient.

Leaving aside regulations for newly built housing, improving energy efficiency in existing homes largely involves upgrading/retrofitting and installation of solar power. Retrofitting houses, particularly those that pre-date more energy-focused building standards, has been found to generate substantial energy savings (Sustainability Victoria, 2019. McAndrew et al., 2021). Upgrading/retrofitting can be related to: cavity wall and ceiling insulation; clothes dryers; refrigerators and freezers; draught sealing; gas heating ductwork; hot water heaters; heating and cooling systems; lighting; swimming pool pumps; window insulation; external shading, and other strategies (Sustainability Victoria, 2019) – with some of these being tried across the interviewee cohort in this study.

Making housing energy efficient can be operationalized in a range of ways:

- Via government regulation of housing standards, for example for rental homes (public and private), and/or for homes at point of re-sale. Bryant et al. (2022) recommend minimum energy efficiency standards for rented homes, building on existing standards in Victoria and ACT, along with disclosure of energy efficiency ratings. This is consistent with the current Commonwealth-State collaboration on the Trajectory of Low-Energy Buildings. Other researchers have also called for the application of such standards, including in relation to housing for First Nations people in Australia (Perenyi et al., 2019):
- The gap between landlord property maintenance and the experiences of tenants of such properties warrants the implementation of ‘minimum standards’ regulations to existing dwellings and mandatory reporting on the property’s energy efficiency rating (Perenyi et al., 2019, p.12).
- Via schemes that fund or subsidise landlords and/or householders (including tenants) to upgrade home fixtures, solar installation and electrification upgrades (Bryant et al., 2022).

As Bryant et al. (2022) point out, disadvantaged households are at risk of missing out on the benefits of energy efficiency upgrades if they cannot afford to undertake retrofitting and/or, as this study shows, are denied doing so by their landlords. Additionally, currently there is a ‘split incentive problem’ (Browne & Schultz-Byard, 2021, p.2) where ‘landlords have the right but not the incentives to invest in energy efficiency, while renters have the incentives but not the right to make these investments’ (Bryant et al., 2022, p.8). This means that the design of these strategies needs to carefully address access by all groups (owner-occupiers, landlords, tenants- both public and private), and all types of housing stock (Bryant et al., 2022).

While a range of strategies and interventions should be designed and led by government, the role of a community-based energy efficiency service is to streamline access to these and, potentially, engage in direct provision of energy efficiency upgrades and retrofits, particularly for those groups who are experiencing energy hardship but whose access to these opportunities is compromised.

Activities to make household energy use more efficient

As identified by McAndrew and colleagues (2021), household energy efficiency programs are effective in supporting households to gain knowledge about and implement strategies to reduce energy consumption, which in turn supports wider health and wellbeing outcomes. This current research echoes these findings. A wide range of activities are included in household interventions including information provision about energy efficiency strategies and financial supports, as well as support to access retrofit and appliance upgrade schemes.

This research highlights that a range of actors deliver these strategies but in a largely uncoordinated way. They include:

- Energy retailers
- Governments, and
- Community service providers.

These programs are valued and need continuation, and expansion. As reported by Energy Consumers Australia (2020), trusted, independent services are valued by energy consumers, and are best placed to provide support.

This highlights the role of services such as the Uniting Energy Efficiency Service, which is discussed in the next section.

The Uniting Energy Efficiency model of support – reimagined

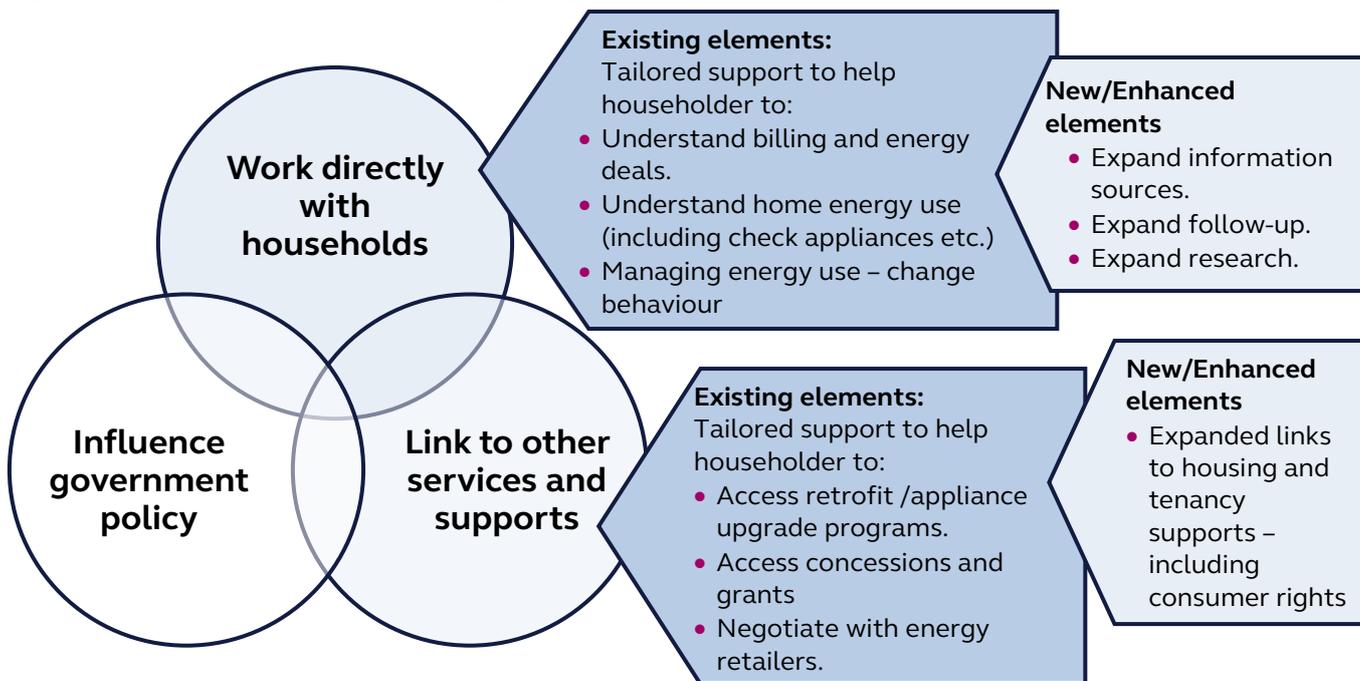
The evidence of this study is that the Uniting Energy Efficiency Service is achieving outcomes for consumers and is highly valued by them. However, given that the ongoing experience of energy hardship is constructed by the intersection of multiple factors across the ecosystem, such an energy efficiency service necessarily needs to interact with, and influence, other parts of the ecosystem and be ‘multi-level’ in focus, as suggested by McAndrew et al.’s (2021) review of the evidence about effective energy efficiency support.

A central theme of both the data in this study, and the literature more broadly, is the complexity of the energy efficiency ecosystem which is frequently beyond the capacity of households in hardship to manage. Such households need to engage with multiple actors: energy retailers, landlords, providers of grants and subsidies, community services related to a wide range of needs, and specialized energy efficiency services. Additionally, navigating entitlements to energy cost relief and to the cheapest energy cost structures is confusing and obscure. In this context, the Uniting Energy Efficiency Service can be seen as a ‘front door’ and **navigation partner to householders**, and an **advocate and influencer for householders across the ecosystem**.

While the focus of household energy efficiency interventions has largely foregrounded householder education and behaviour, programs such as the Uniting Energy Efficiency Service are largely working with households already experiencing some level of energy and/or debt crisis. The focus of the service, then, is necessarily *hardship*, of which energy access and use is a primary concern but where energy hardship is understood to be constructed by a wide variety of factors. This highlights the important role of the service to support households to deal with this range of issues including tenancy matters, access to quality housing, access to appropriate income support, psychosocial and health support, among others. Because these are contributing factors to energy hardship, unless they are addressed, energy hardship is likely to continue.

The below diagram summarises the three main activity areas a reimagined Uniting Energy Efficiency Service could address, if designed to meet the needs of householders in this study. The model identifies existing elements of service that should be retained, with some potential areas of enhancement.

Figure 8. Proposed service model for Uniting Energy Efficiency Service



Note: Areas of blue represent areas of greatest activity/emphasis for the Energy Efficiency service.

Working directly with households

Consistent with the research (McAndrew et al., 2021) on the ingredients of effective energy efficiency programs for householders, the Uniting Energy Efficiency Service is a multi-element program offering information and behavioural change strategies, as well as linkage to retrofit and appliance upgrade programs, financial and other supports. Current activities of the service should be retained and include tailored support to the household in relation to:

- Analysing and explaining energy bills, and advice about the best energy rate/deal
- Providing information about and assistance with accessing grants and rebates
- Undertaking home assessments of appliance consumption and recommending changing to more energy efficient appliances
- Suggesting or assisting with retrofits
- Providing relevant energy efficiency tips and information.

These activities are delivered in a non-judgemental way with time to listen to the householder and understand their circumstances. Underpinning these activities is an orientation towards energy use for these households that recognizes that identifying and addressing under-consumption of energy, linked to extreme rationing behaviours, is as important as addressing over-consumption. Information, advice, assessments, and linkage to relevant resources (financial and informational) address both these areas.

This set of current service elements can be expanded in three key areas, based on the evidence in this study.

1. Expand information and education resources.

A range of topics were deemed to be useful by householders where they valued more ready access to information. These included how to read and understand energy bills; how to select energy efficient appliances (by having a list of common appliance energy use); and general energy efficiency tips. Householders valued information with pictures and simple explanations. Of particular importance is information about available concessions, rebates, grants, and schemes (including upgrade and retrofit schemes) and how to apply for these, i.e., navigation resources. Householders valued resources in different formats including hard copy (pamphlets and information sheets), as well as in digital form, e.g., apps and automated reminders.

2. Expand follow-up with households.

While the service welcomes further queries from householders and sometimes provided follow-up (post-service) contact, this does not appear to be a routine feature of the service. Householders suggested follow up might be made in relation to specific issues, or to check-in once per year to support energy plan choices and remind householders of energy efficiency strategies.

3. Expand reach to non-referred householders within the cohorts most likely to be affected by or at risk of energy hardship.

There is now substantial evidence that characterizes the cohort of those most at risk of energy hardship including those on income support, those with disability or medical conditions, and people from culturally and linguistically diverse communities. The service could pro-actively target these groups to provide information and support. At present, access to the service is largely via referral usually from the energy provider and hence some time period into the trajectory of energy hardship.

This expanded service would require additional resourcing.

Link to other services and supports

As described above, taking a broader hardship lens, connecting householders to other services, and advocating for them to energy retailers are key elements of the existing service. This set of activities includes:

- Advocacy to energy retailer for better deals, meter checks and appropriate payment plans (including negotiating reductions in payment plan terms).
- Providing information about and referral to support services, including other sources of financial relief.
- Supporting access to retrofit and appliance upgrade programs.
- Supporting access to concessions and grants.
- Supporting access to other relevant services, such as Emergency Relief, food banks etc.

One area not identified in current energy efficiency service design is the provision of support in relation to tenancy rights and housing access. In this study and elsewhere, poor quality of housing is a major contributor to energy inefficiency and tenants are more at risk of energy hardship (Bryant et al., 2022). In this study, householders were denied reasonable requests to address housing and fixture issues, in both public and private tenancy arrangements, or were forced to bear the costs themselves. A stronger focus on housing and tenancy rights and links to support services in this area is a key strategy in addressing the overall contributors to energy hardship.

Influence government policy

Energy hardship is constructed by multiple factors and hence, as the literature suggests, the provision of effective household energy efficiency programs needs to be not only multi-element but multi-level (McAndrew et al., 2021). Addressing one set of factors influencing energy hardship without connection to the others cannot fully remedy energy hardship. It is evident in this study that, while the service was valued and provided helpful support, in many instances the energy hardship persisted due to these factors still being in place. A role of the Uniting Energy Efficiency Service is to advocate for and inform design of:

- Appropriate income support mechanisms.
- Mechanisms to achieve minimum standards for energy efficiency housing.
- Affordable energy.
- Support programs from energy retailers and government to address the needs of households experiencing energy hardship.

Conclusion

This study sought to examine the impacts of a home energy support service provided by the community-based organisation Uniting Vic Tas. The research explored the drivers of energy hardship, the nature of the supports provided when households found themselves in these circumstances and the benefits of the support provided.

The stories of the forty householders interviewed in two States highlights the way energy hardship is constructed by factors at the macro level - such as low levels of income and poor quality housing, at the meso level – such as energy retailer response and landlord behaviour, as well as the micro level – including experiences of illness, disability, and familial circumstances. In this context, taking a narrow lens to the design of energy hardship supports is clearly inadequate. While households require timely and tailored support to suit their own mix of circumstances, energy efficiency services should also undertake the role of advocate and influencer of the broader system given their in depth knowledge of how these factors construct energy hardship.

Given that energy hardship is an issue for a significant portion of the population in Australia, and that the cohort characteristics are so well established, it is surprising that supports are available in such an ad hoc manner. While supports exist, they are provided by a range of actors and take a variety of forms and timeframes. Not surprisingly, not all supports are known by those who need them. In this context, a service that provides valued advice about ways to increase energy efficiency and maximises access to the range of financial and other supports available is a critical piece of the energy ecosystem.

This report offers suggestions for the design of energy supports more broadly across the ecosystem and for the enhancement of community based services, such as the Uniting Energy Efficiency Service. The findings highlight what other research has already evidenced, that such services are a 'lifeline' (Carrie, NSW, pre Covid) that need to be expanded to all Australians experiencing energy hardship.

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Appendix One: Full Analysis of Energy Use Data

Overall energy use

Analysis of all energy data reveals that the overall average daily energy use for the entire data period was 22.2kWh (Table 1). However, the data also reveals that this average has slightly decreased over the years. In pre COVID 2019 the average daily energy use was 23.9kWh, while during the two main COVID years of 2020 and 2021, the daily average was 20.1kWh and 22.3kWh respectively. The 2022 data shows a daily average of 21.3kWh. NSW based homes had the highest daily average of 33.6kWh, while Queensland averaged 23.4kWh. Victorian homes had the lowest average daily energy use of 19.9kWh, but Victorian homes mainly use natural gas for their winter heating, while Queensland and NSW generally rely on reverse cycle air conditioners for their winter heating and summer cooling. In addition, many Victorian homes will not have an air conditioning unit at all for summer cooling and may rely on ceiling fans or evaporative coolers, both of which have low energy consumption. Consequently, it is expected that Victorian homes would have a lower average for electricity use when compared to other states.

Table 1. Daily average energy use by year (kWh)

State	2019	2020	2021	2022	All Years	% Homes Above Average
NSW	34.8	32.0	34.2	32.3	33.6	33.9%
QLD	23.2	27.1	20.8	17.5	23.4	50.7%
VIC	22.6	17.6	18.3	17.7	19.9	40.8%
All States	23.9	20.1	22.3	21.3	22.2	40.1%

Seasonal variation in energy use is to be expected. The heating and cooling of our homes is usually the single biggest energy use in our homes (Milne and Reardon, 2022). Table 2 shows the average daily energy use by season for each city. The highest seasonal energy use is in NSW in winter, with a daily average of 47.0kWh. Victoria also has a high daily winter use average of 26.6kWh while in Queensland the highest energy use season is summer, at 26.8kWh on an average day. The seasonal peaks in each region reflect whether a region is heating or cooling dominated. It is not surprising to see summer as the peak season in Queensland which aligns with the use of air conditioning for cooling. Likewise, the winter months are going to see higher totals in the more southern regions. Again, the high dependence on natural gas for heating in Victoria is probably why their winter average is lower than that of NSW. Victoria's lowest consumption season is summer (15.6kWh) which again is probably due to the low presence of air conditioning units in Victorian homes.

Table 2. Daily average energy use by season (kWh)

State	Summer	Autumn	Winter	Spring
NSW	30.3	26.3	47.0	31.5
QLD	26.8	21.9	24.1	21.3
VIC	15.6	18.0	26.6	18.6

Figure 1 shows the distribution of the average daily energy use in each State. In Victoria, 12.5% of homes use 5kWh/day or less, while it is 4.0% and 5.1% of homes in NSW and Queensland respectively. This is very low consumption and well below the Australian average of 15kWh ((Frontier Economics, 2020)¹. Such low consumption rates are concerning and potentially indicates households that are suffering energy stress. Especially considering that many of the homes in this project are old and most likely not

¹ Frontier Economics. (2020). *Residential energy consumption benchmarks*. Australian Energy Regulator.

energy efficient. 1.5kWh/day is what a typical refrigerator uses (Harrington, 2018)², so assuming all homes in the study have a refrigerator, this leaves very little energy for other uses.

Conversely, many homes had very high daily consumption values, especially in NSW. 22.5% of NSW houses had an average daily energy use of more than 40kWh. As seen in Table 2, winter in NSW has high consumption values due to the high reliance on electricity for winter heating, so this may be leading to high overall averages for some homes.

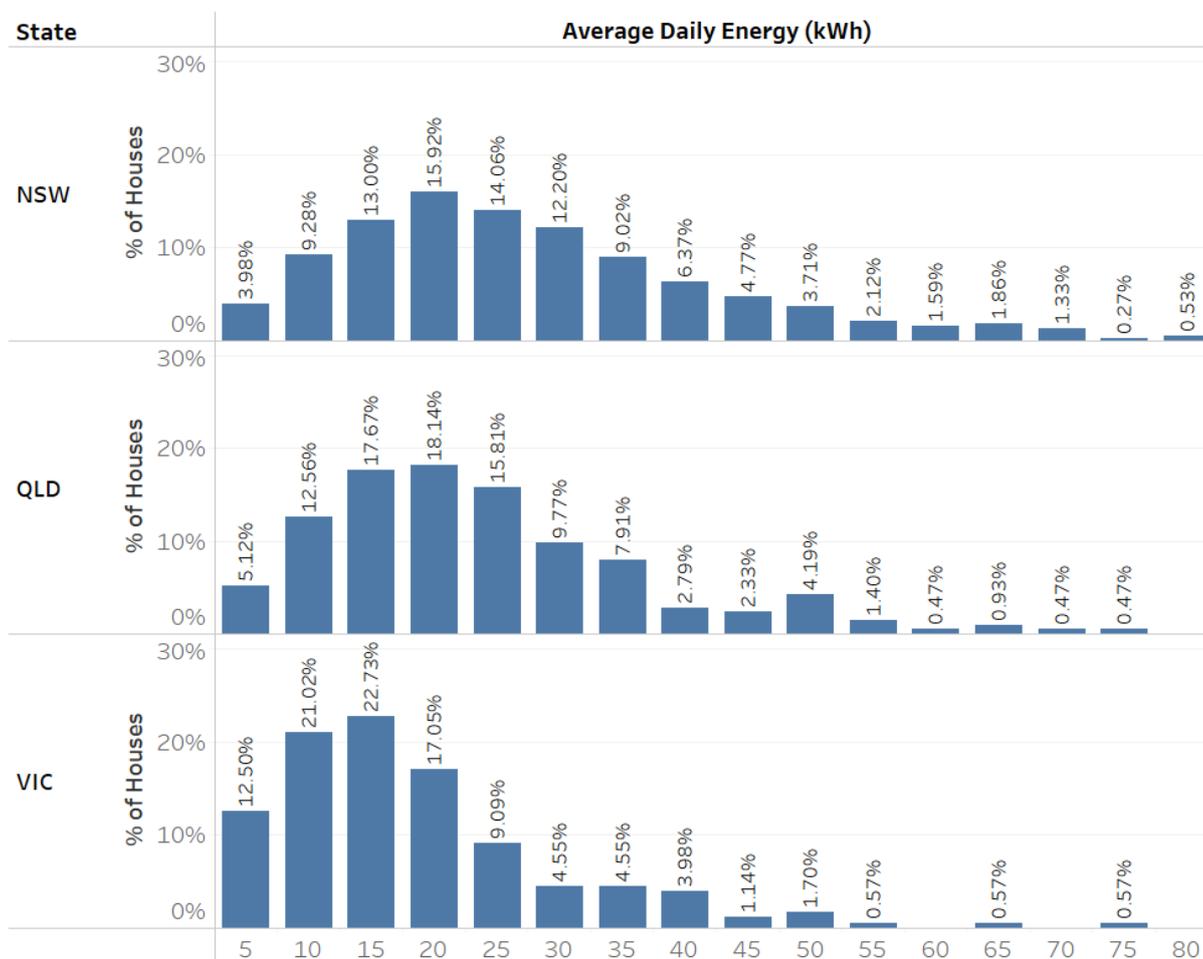


Figure 1. Average daily energy use distribution by house and State (kWh)

Intervention energy use

All homes within this study had an intervention appointment to try and help with their energy costs. These appointments covered a range of tactics and measures that households could try to implement to reduce their costs. Table 3 shows the average daily energy consumption both prior to the appointment intervention date and after the appointment. It shows that reductions in the average were seen, especially in Queensland where there was a 10% reduction. Victorian homes saw a 6.3% reduction, but in NSW only a very small reduction of 0.6% was observed.

Table 3. Average daily energy consumption pre and post appointment date (kWh)

Appointment Energy	NSW	QLD	VIC
Pre-Appointment	33.7	24.9	20.5
Post-Appointment	33.5	22.4	19.2

² Harrington, L. (2018). *Prediction of the Energy Consumption of Refrigerators During Use*. University of Melbourne.

Figure 2 is a box and whisker scatter plot for each daily consumption value for each house, both pre and post the intervention date. It is interesting to note the change in the scatter pattern, particular in NSW and Victoria for those homes that showed well above average consumption. Victorian homes show a tightening of this upper grouping with no home exceeding 135kWh/day after the intervention. This might indicate that those households that had very high energy use benefitted the most from the appointment and were able to reduce their consumption. However, in NSW we see the opposite happening. After the intervention we see a greater proportion of data points with the very high consumption values.

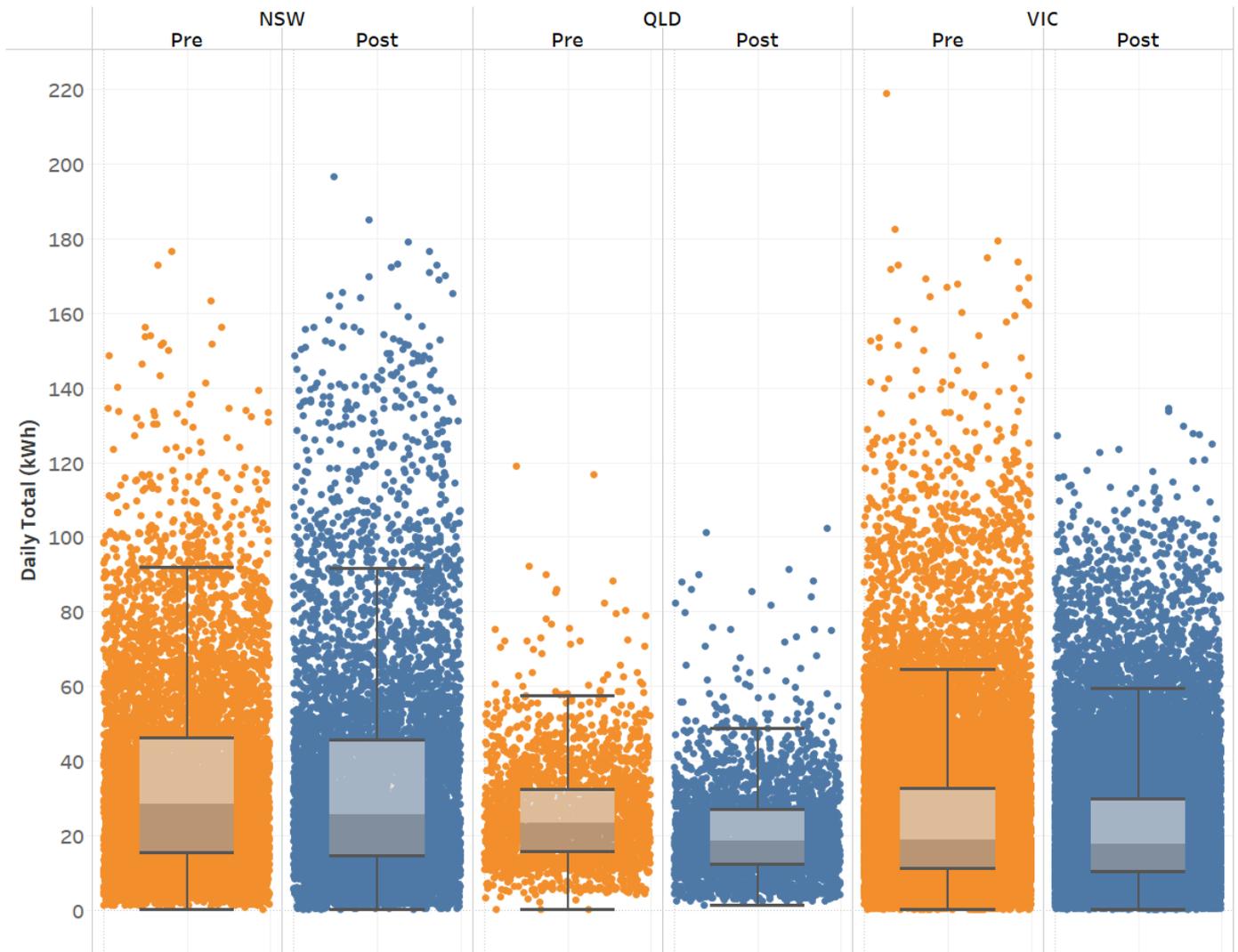


Figure 2. Daily energy consumption pre and post appointment date (kWh)

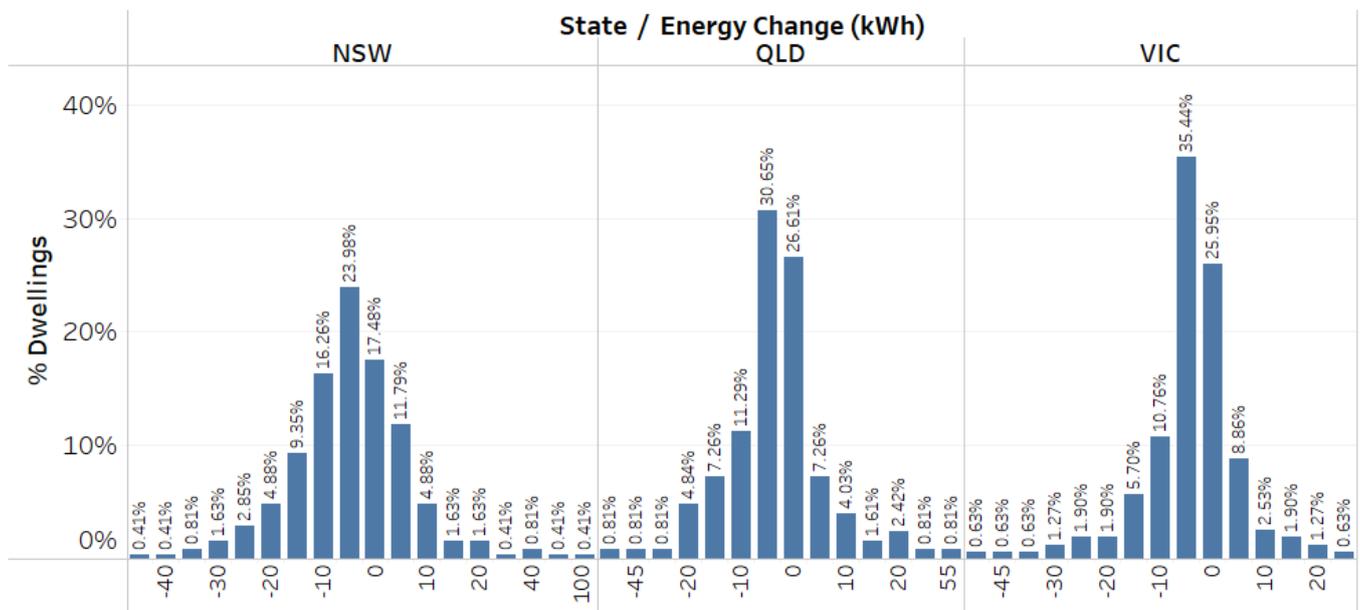
Average daily energy consumption was calculated for each house both pre and post the intervention date and the change between these two values was determined. Table 4 shows that the majority of houses in each State saw a small decrease in their average daily energy use with the median reduction being between 0.7 to 2 kWh/day. In NSW the median was a 2 kWh/day reduction which is a 7.6% reduction in daily energy use. The largest reductions seen by an individual house was around 60kWh/day in each State.

Table 4. Energy change post intervention date

	NSW	QLD	VIC
Median Energy Change (kWh/day)	-2.0	-1.0	-0.7
Median % Energy Change	-7.6%	-4.4%	-5.7%
Largest Energy Reduction (kWh/day)	-62.0	-68.5	-58.5
Largest Energy Increase (kWh/day)	100.4	59.2	37.1

Figure 3 shows the distribution of these changes for each State and shows a dominant spike around median for each State with a relatively even distribution either side of the spike.

Energy Change



% Energy Change

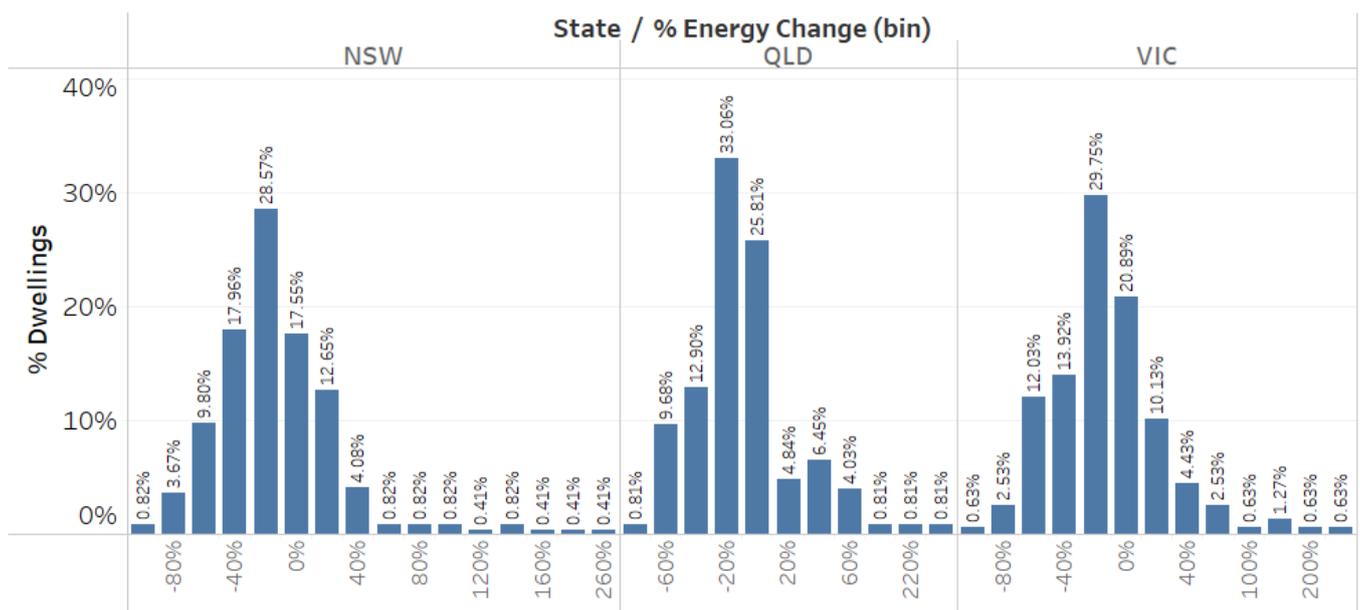


Figure 3. Daily energy change post intervention distribution

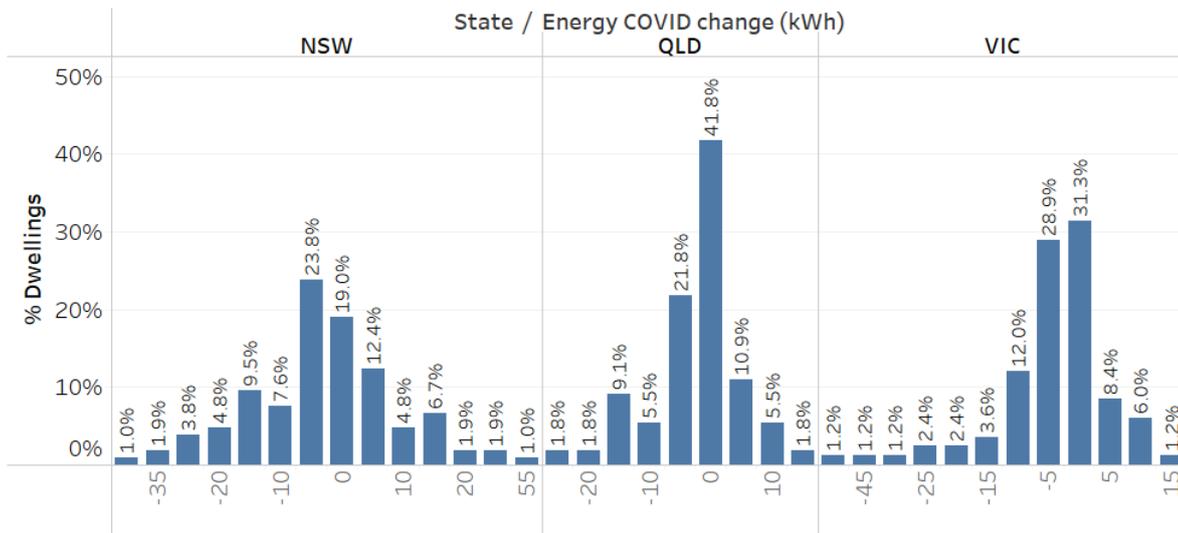
COVID energy use

Similar analysis was undertaken to explore energy changes that occurred pre and post the COVID lockdown. For this study the COVID lockdown date was set as 1st March 2020, so this was used to split the energy data as pre and post COVID where data for houses was available. Table 5 shows that overall, there was little change in the energy consumption averages post the COVID lockdown. NSW and Victorian houses saw a slight reduction based on the median, while Queensland had a small increase. Figure 4 shows the distribution of these post COVID lockdown changes in the average daily energy use and generally little change was observed in consumption.

Table 5. Energy change post COVID date

	NSW	QLD	VIC
Median Energy Change (kWh/day)	-0.2	1.3	-0.4
Median % Energy Change	-1.50%	6.40%	-3.60%
Largest Energy Reduction (kWh/day)	-114	-20.2	-53
Largest Energy Increase (kWh/day)	58.6	16	18.3

Energy COVID Change



% Energy COVID Change

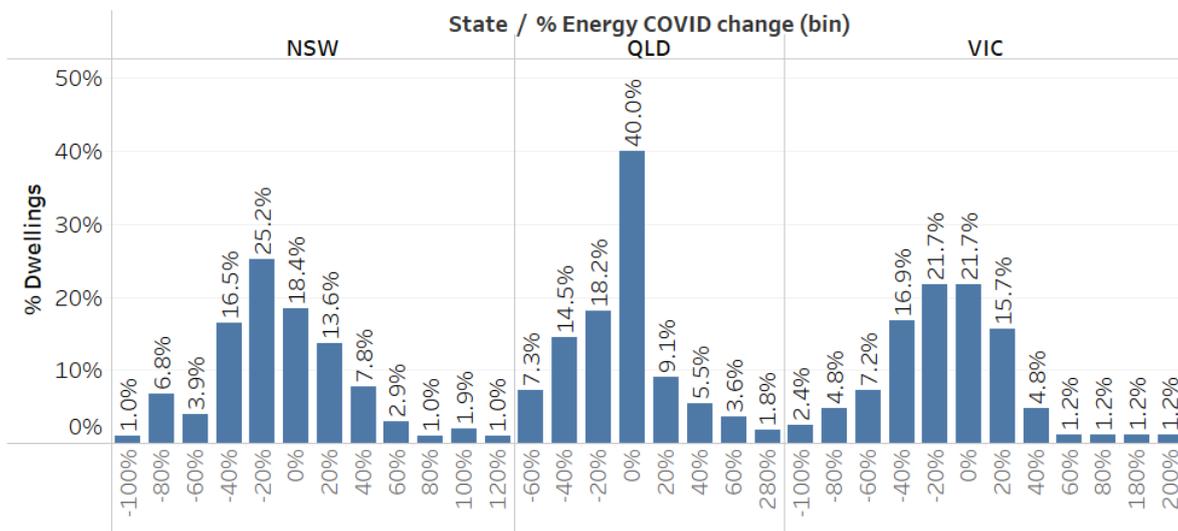


Figure 4. Daily energy change post COVID distribution

Interview group energy use

A subset group of 40 households were selected for detailed interview as part of this study. These households were in NSW and Victoria only. Households were divided into cohorts where the intervention had occurred either before the COVID lockdown or during the COVID lockdown and then energy consumption was analysed both pre and post the intervention. In addition, some of the homes in Victoria had PV systems installed. As noted in the methodology, PV systems can cause issues with the data collected and may not reflect the actual energy consumption of the household due to the energy that the PV systems provide to the house not being included. Consequently, in the previous analysis these houses have been excluded. However, for these interview households the homes with PV have been included but separated out. Table 6 lists the average daily energy consumption of houses in each cohort. It shows that most homes saw little change in their average consumption post the intervention. It is interesting to note the differences in the daily average for homes in NSW that had their interventions pre the COVID lockdown and those during. The “During COVID” cohort has an average daily consumption more than double that of the houses in the “Pre COVID” group. This large difference is not seen in the complete dataset and appears to be a quirk of the “Pre COVID” group with their low daily consumption rate. The average daily consumption rate for NSW houses from the complete dataset is around 33.5kWh which is close to the average that the “During COVID” group is achieving.

Table 6. Interview group average daily energy consumption (kWh)

Group	Solar PV	Pre	Post
NSW Pre Covid	No	17.04	17.08
NSW During Covid	No	35.17	35.66
VIC Pre Covid	No	24.9	23.48
VIC Pre Covid	Yes	12.68	19.18
VIC During Covid	No	18.72	17.08
VIC During Covid	Yes	16.51	19.42

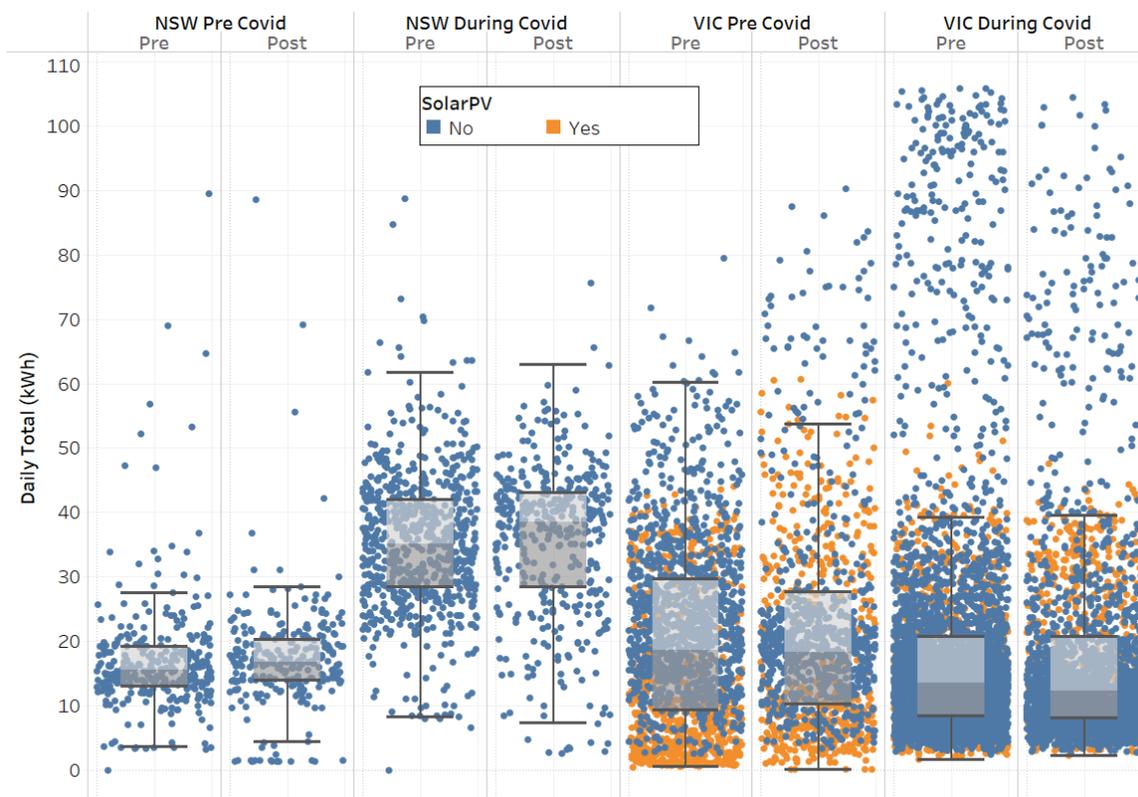


Figure 5. Interview groups daily consumption

The box and whisker scatter plot Figure 5 shows clearly the split in the NSW based cohorts and also shows that within the Pre COVID group the scattering is quite tight.

Occupancy energy use

Additional data was available on various characteristics of each household and analysing energy data using these characteristics can give further insights to energy consumption patterns. For example, Figure 6 shows the daily energy use of households based on the number of occupants in each household. This data was only available for NSW and Queensland homes, but shows that as household size increases, so does energy consumption. This is to be expected and not overly surprising, but it is important to note that the increase is not linear. That is, a five-person household does not consume five times the energy of a single person household. Indeed, in both States the average energy consumption only doubles between a single person household to a large household of five people. Much of the energy use is fixed regardless of how many people are in a home. Refrigeration energy is generally not impacted by occupancy number and even heating, cooling and lighting energy is often not greatly impacted. This means that energy costs often have a greater impact on single person households than on households where the cost might be able to be shared.

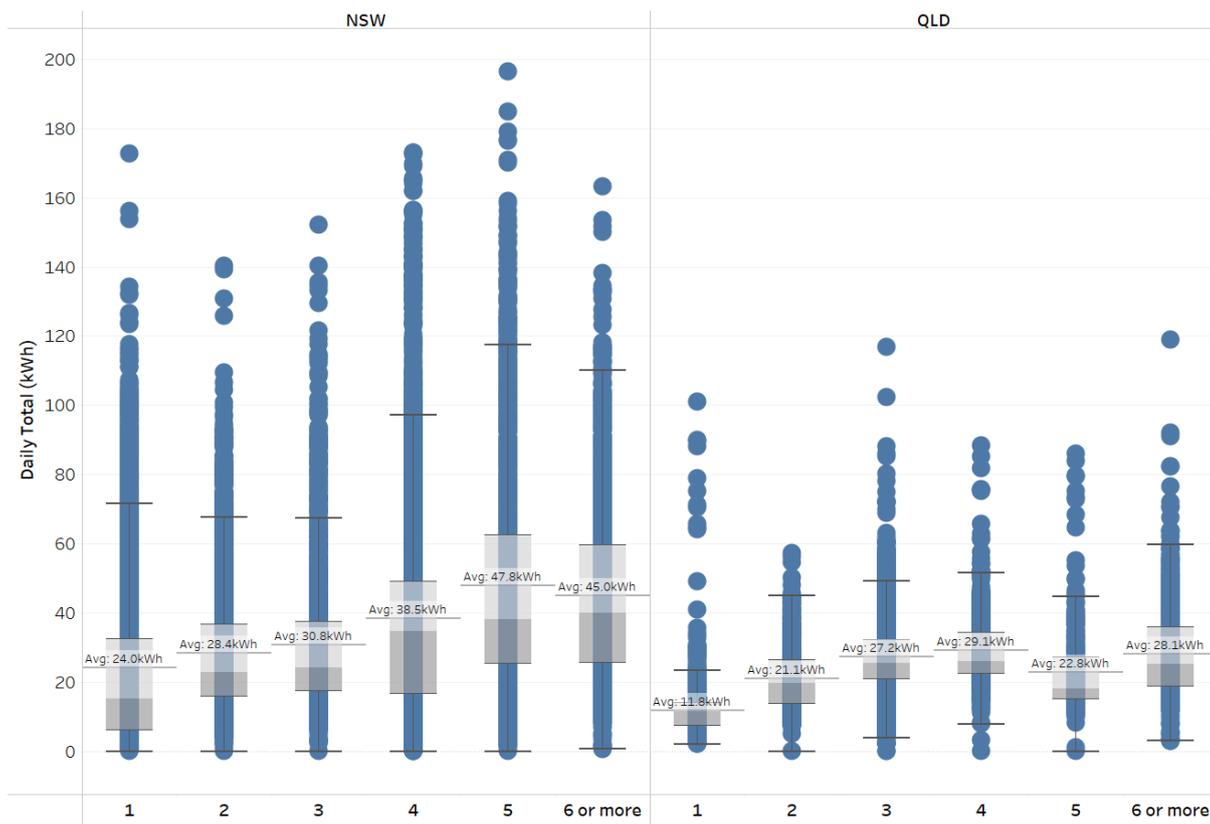


Figure 6. Daily energy use by number of occupants

Energy costs

Billing cost data was also analysed. The overall amount that a household is charged generally consists of a range of costs, including peak and off-peak energy consumption as well as a fixed daily supply charge. Many households will also receive various discounts, concessions, and rebates to lower their costs and households with PV may receive credits for energy that they have feed back into the grid. Combining all the costs, discounts, rebates, and credits together allows the actual cost charged to be determined. Like the energy consumption data, this cost can be converted into an average daily cost to allow comparison. Table 7 lists the average daily charges for each State over the years covered by the data. Both the fixed daily supply charge and the total daily charge are listed, and it shows in Queensland

the total charge has actually reduced by 25% from 2019 to 2022. In Victoria it has reduced by 5% and in NSW it has increased slightly by 1%. In all States the fixed daily supply charge reduced from 2019 to 2022. 8% in NSW, 14% in Queensland and 21% in Victoria.

Table 7. Average daily supply and total charge by State and year

State		2019	2020	2021	2022
NSW	Avg. Daily Supply Charge	\$1.20	\$1.16	\$1.12	\$1.10
	Avg. Total Daily Charge	\$5.96	\$6.09	\$6.52	\$6.02
QLD	Avg. Daily Supply Charge	\$1.15	\$1.07	\$0.99	\$0.99
	Avg. Total Daily Charge	\$5.53	\$4.57	\$4.03	\$4.15
VIC	Avg. Daily Supply Charge	\$1.27	\$1.15	\$1.02	\$1.00
	Avg. Total Daily Charge	\$5.07	\$4.54	\$4.79	\$4.82

The significant reduction in total energy costs in Queensland mirrors the reduction seen in average daily energy use which showed a 25% reduction as well. In Victoria energy use reduced by 22% while in NSW it reduced by 7% over this same period. This would suggest that tariff rates in Queensland have remained steady while in Victoria and NSW they have increased.

Figure 7 is the distribution of the average daily total costs for each house by State and shows that in NSW 27% of homes had average daily costs of seven dollars or more, while in Queensland and Victoria 19% and 16% of homes respectively had costs of \$7/day or more.

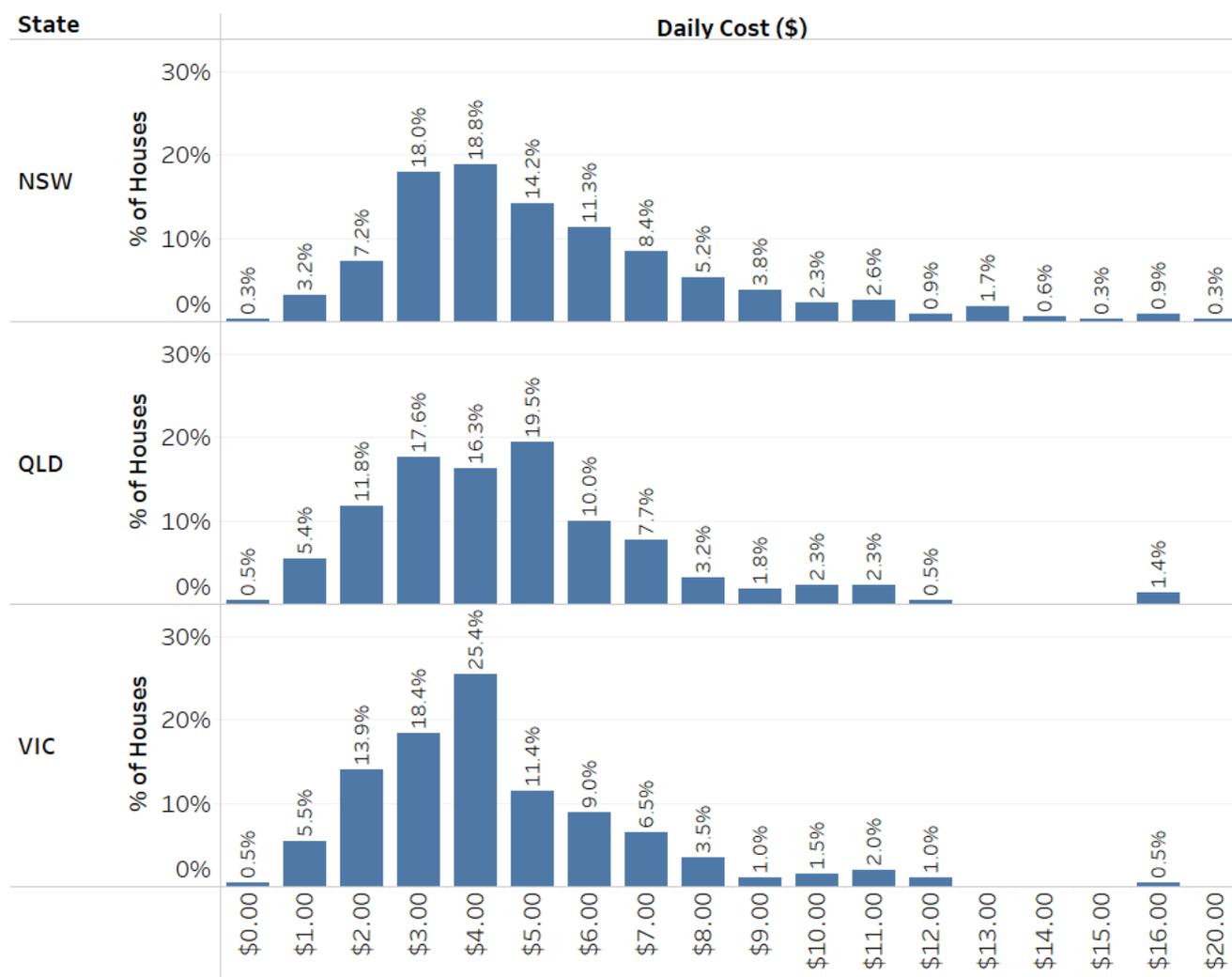


Figure 7. Average daily total cost distribution by State

Table 8 lists the daily average costs for each State both pre and post the intervention appointment date. As seen previously where a reduction in energy use was observed, a reduction in costs is also observed. For houses without a PV system, there is a 21.2% reduction in NSW, 9.3% in Queensland and 12.1% in Victoria. As would be expected, homes with PV installed see a lower average cost than homes without PV, although caution is warranted with these differences due to the low number of homes in the study that had PV. This is especially true for Queensland where only 1.3% had PV installed. Victoria had the highest number of PV installs (9.5% of houses) and a reduction in average cost of 4.5% (Pre-Intervention) and 10.4% (Post-Intervention) was observed compared to homes that did not have PV.

Table 8. Average daily total charge pre and post appointment date

Appointment Date	NSW		QLD		VIC	
	No PV	PV	No PV	PV	No PV	PV
Pre	\$7.07	\$7.03	\$5.48	\$3.64	\$5.24	\$5.00
Post	\$5.57	\$4.57	\$4.97	\$3.62	\$4.61	\$4.13



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