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ENERGY POVERTY AND OLDER AUSTRALIANS

The Extent, Causes and Impacts

Caroline Porto Valente

UTS UNIVERSITY OF TECHNOLOGY SYDNEY

Energy poverty and older Australians: The extent, causes and impacts

by Caroline Porto Valente

Thesis submitted in fulfilment of the requirements for the degree of

Doctor of Philosophy

under the supervision of
Professor Sara Wilkinson and Professor Alan Morris

University of Technology Sydney
Faculty of Design, Architecture and Building

January 2022

Certificate of Original Authorship

I, Caroline Porto Valente, declare that this thesis, is submitted in fulfilment of the requirements for the award of Doctor of Philosophy, in the School of Built Environment (Faculty of Design, Architecture and Building) at the University of Technology Sydney.

This thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

This document has not been submitted for qualifications at any other academic institution.

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Caroline Porto Valente

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Abstract

Faced with predictions of resource scarcity and climate change impacts in the near future, governments and the global energy sector need to address three big challenges–increased demand for energy security and infrastructure reliability in uncertain scenarios, the urgent need for a clean energy transition towards low-carbon energy sources and energy efficiency, and ensuring the accessibility and affordability of energy supply across the population. Referring to the latter, energy poverty, as it is manifest in more advanced economies, affects millions of people and is the product of three main factors: the cost of energy for essential needs relative to income, the energy efficiency of the home and household income. The issue is largely overlooked in Australia, and the precarious situation in which energy poor households live is under-researched. Unless there are major interventions, rising energy costs and climate change are likely to increase household energy expenditure in future decades, widening and accentuating the problem. Living in poor indoor environmental conditions due to energy poverty is a health risk especially for older people (those aged 65 years and over), who constitute a growing proportion of the population, especially in advanced economies. Low-income older households are among the most vulnerable to energy poverty.

This study examines energy poverty among older Australians on low incomes, to understand the extent of the issue amongst this group, the contributing factors and its impacts. The research design uses a mixed methods approach. A quantitative analysis of the Australian Housing Conditions Dataset, published in 2019, enabled a generic understanding of the extent of energy poverty among older households and the housing conditions that might contribute to it. To complement it, a qualitative analysis of 23 in-depth semi-structured interviews presents the voices of those who suffer energy poverty. Their perspectives on the factors that shape their experience of energy poverty added original insights into the study. Pierre Bourdieu's concepts of field, capital, symbolic violence, and habitus were used to analyse the interviews. A key focus, drawing on Amartya Sen's concept of capabilities, is how energy poverty affects Age Pensioners' capacity to lead a decent life. With contributions that extend the body of knowledge about the extent, causes and impacts of energy poverty in Australia and broader theory advancement, this research provides a basis for better policy frameworks and potential solutions to alleviate energy poverty among vulnerable households.

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To my dear love and partner of all adversities,
dreams, and adventures, Kenzo.
Life is easier beside you.

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Science is not only compatible with spirituality;
it is a profound source of spirituality.
(Carl Sagan)

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List of Abbreviations

ABS – Australian Bureau of Statistics

ACOSS – Australian Council of Social Services

ADA – Australian Data Archive

AEMC – Australian Energy Market Commission

AEMO – Australian Energy Market Operator

AEPO – Australian Energy Poverty Observatory

AER – Australian Energy Regulator

AHCD – Australian Housing Conditions Dataset

AIHW – Australian Institute of Health and Welfare

CAHA – Climate and Health Alliance

CALD – Culturally and linguistically diverse

COPD – Chronic Obstructive Pulmonary Disease

COTA – Council on the Ageing

CPSA – Combined Pensioners and Superannuation Association

EAPA – Energy Accounts Payment Assistance

EEC – Energy Efficiency Council

ENCRC – Energy National Cabinet Reform Committee

EPOV – Energy Poverty Observatory

EU-SILC – European Union Statistics on Income and Living Conditions

EWD – Excess Winter Death

EWON – Energy & Water Ombudsman

GHG – Greenhouse Gas

HAAG – Housing for the Aged Action Group

HECS – Household Energy Consumption Survey

HES – Household Expenditure Survey

HILDA – Household, Income and Labour Dynamics in Australia

IPCC – Intergovernmental Panel on Climate Change

LGA – Local Government Area

LIEEP – Low Income Energy Efficiency Program

LIHC - Low-Income/High-Cost

MRI – Magnetic Resonance Imaging

NatHERS – Nationwide House Energy Rating Scheme

NCOSS – NSW Council of Social Service

NEM – National Electricity Market

NSW – New South Wales

OECD – Organisation for Economic Co-operation and Development

PCA – Property Council of Australia

PIAC – Public Interest Advocacy Centre

PV – Photovoltaic

QCOSS – Queensland Council of Social Service

SA – South Australia

SIH – Survey of Income and Housing

SUPER – Superannuation

TOU – Time of Use (Tariff)

NILS – No Interest Loans Scheme

UK – United Kingdom

UNFCCC – United Nations Framework Convention on Climate Change

US – United States

VCOSS – Victorian Council of Social Service

VIC - Victoria

WEC – World Energy Council

WGEA – Workplace Gender Equality Agency

WHO – World Health Organisation

Chapter 1 Introduction

Introduction

This first chapter sets out the rationale for the thesis and is structured as follows. Section 1.1 situates energy poverty around the greater picture of the global energy trilemma, thereby establishing a broader research context. Next, I discuss the definitions of energy poverty in Section 1.2, emphasising how its conceptualisation has developed with theory advancement. The following sections explore energy poverty in Australia (Section 1.3) and show how poor housing conditions, energy poverty, extreme weather events due to climate change, and health issues are intertwined among vulnerable households, particularly older Australians on low incomes (Section 1.4). This is the main background for the research, as few Australian studies have investigated the topic in any detail[1]. The subsequent sections depict the problem statement and the research aims (Section 1.5), followed by the research questions (Section 1.6). A brief statement on the research approach and scope of study outlines the main methodological aspects in Section 1.7. Lastly, in Section 1.8, the research contributions of the thesis empirically, theoretically and practically, precede a preview of the subsequent chapters (Section 1.9).

1.1 The big picture around energy poverty

The global energy sector is at a tipping point and faces three major challenges: transitioning towards cleaner energy generation and reducing greenhouse gas emissions (GHG) under the 2015 Paris Agreement (UNFCCC, 2015; United Nations, 2021b); expanding energy infrastructure and the reliability thereof to meet rising global energy demand in a context of resilience challenges (WEC, 2016); and improving energy accessibility and affordability worldwide during this transition (Carley & Konisky, 2020; McCauley, 2018). This is also known as the energy trilemma; balancing three core and usually competing dimensions –

[1] Although there is a lack of studies that address all topics concomitantly, there are emerging and substantial Australian studies that address one or more of the subjects (see ACOSS, 2018; Chester, 2013; Cooper et al., 2016; Liu et al., 2019; Nance, 2013; Nicholls et al., 2017a; Nicholls et al., 2017b; VCOSS, 2017; Waitt et al., 2016; Willand & Horne, 2018).

energy sustainability, energy security, and energy equity (Heffron & McCauley, 2017; WEC, 2016). Each dimension is detailed in Table 1.1.

Table 1.1 - Energy trilemma dimensions and definitions

ENERGY TRILEMMA DIMENSION	DEFINITION
Energy Sustainability	Encompasses achievement of supply- and demand-side energy efficiencies and development of energy supply from renewable and other low-carbon sources.
Energy Security	Effective management of primary energy supply from domestic and external sources, reliability of energy infrastructure, and ability of energy providers to meet current and future demand.
Energy Equity	Accessibility and affordability of energy supply across the population.

(Source: Adapted from WEC, 2016, 2018)

As Robertson and Henwood (2019) point out, the way society produces, markets and consumes energy is intimately bound up with the broader issues of the trilemma, including energy supply and infrastructure, energy affordability and climate change adaptation. During the coming decades, five fundamental actions must be taken with respect to the energy trilemma: transforming and reshaping the energy supply; advancing energy access; enabling consumer affordability and industry competitiveness; improving energy efficiency throughout the entire chain to better manage demand; and decarbonising the energy sector (WEC, 2016). Among these, the energy efficiency efforts continue to be globally perceived as a priority with huge potential for improvement and benefit in the other areas.

The World Energy Council (WEC), in partnership with the Oliver Wyman consultancy, prepares the annual World Energy Trilemma Index, a comparative ranking of 128 countries' energy systems and performance in the three core dimensions (WEC, 2020). The 2020 Index ranks Australia 25th, and behind its neighbour New Zealand (10th) and other nations such as the UK (5th), Uruguay (18th) and Japan (24th). Australia's worst dimension evaluated is energy sustainability, primarily due to its fossil fuel dependency and associated GHG emissions (WEC, 2020). However, the equity dimension has faced substantial electricity price increases, reflecting the problem of energy affordability (Chester & Morris, 2011; Nance, 2013; Nelson et al., 2019).

The energy trilemma in Australia is addressed by Byrne (2017) and Finkel et al. (2017) in the face of the ongoing technological change in the energy sector, which requires better governance, comprehensive system's planning and an orderly energy transition to support each of the following dimensions:

1. Meet the country's climate change commitments under the Paris Agreement to reduce total emissions to 26% - 28% below 2005 levels by 2030, which is an extremely conservative target, compared to other nations, and is still lacking sufficient explicit actions (Climate Action Tracker, 2021);
2. Ensure a stable supply of energy in peak demand periods and extreme weather events, to avoid situations such as the widespread power outage in South Australia due to storm damage to electricity transmission infrastructure in September 2016 (Slezak, 2016) and the damaged power lines and forced outages during the Black Summer[2] in January 2020 (Toscano & Foley, 2020); and
3. Address the constant increases in energy costs and make sure vulnerable households, particularly those in lower incomes, are not left behind in the renewable and technological energy transition (Daniel et al., 2020; Liu et al., 2017; Willand et al., 2021).

This research addresses specifically the energy equity dimension, focusing on unaffordability and the energy poverty issue faced in Australia. Approaching the research on energy poverty with this broader view of the energy trilemma incorporates the context of climate change and securing energy reliability for current and future generations (McCauley, 2018).

1.2 Defining energy poverty

There is consensus that access to an adequate supply of energy is essential for ensuring that basic needs are met, for good health, countering poverty and ensuring economic development (Anagnostopoulos et al., 2016; Reddy, 2000; WHO, 2006). In 2015, ensuring access to affordable, reliable, sustainable and modern energy for all became one of the seventeen United Nation's Sustainable Development Goals (United Nations, 2021a), along with the first goal of ending poverty in all its forms, making the global case that energy poverty and income poverty are intertwined.

[2] The Black Summer refers to the 2019–20 bushfire season, which was the worst New South Wales has recorded. Higher temperatures, low humidity levels and several years of drought resulted in devastating fires across the state. Over 30 lives were lost, more than 2,000 homes were destroyed, and 5.5 million hectares of land was burnt. It has been estimated that over 3 billion animals died or were displaced and many species were pushed closer to extinction (Australian Institute for Disaster Resilience, 2020; Lu, 2021).

Boardman's seminal publication on UK fuel poverty (1991) challenged the assumption that energy poverty was not very different from poverty in general. She argued, while general poverty can be alleviated by financial means and increasing incomes, energy poverty has its roots in poor energy efficiency and needs to be solved through investing in better thermal efficiency and improved heating systems. At that time and in the UK context, her definition of fuel poverty was "the inability to afford adequate warmth because of the inefficiency of the home" (Boardman, 1991, p. 219).

Since then, being unable to pay energy bills (or energy billing hardship), restricting energy consumption to the detriment of health and wellbeing, and having relatively low income and spending a high proportion of it on energy is now a concern for millions of people and one of the central challenges of the contemporary period (Papada & Kaliampakos, 2018; Che et al., 2021). Energy poverty is not confined to poorer or developing countries. Many developed nations (Boardman, 1991, 2010; Bouzarovski et al., 2021; Legendre & Ricci, 2015; Simcock et al., 2018), including Australia have substantial sections of the population suffering from energy poverty (Chai et al., 2021; Chester, 2013; Cornwell et al., 2016; KPMG, 2017).

Defining energy poverty depends on whether one is focused on its drivers, its outcomes, or its practical measurements (i.e., the assumptions used to formulate indicators for measuring its extent) (González-Eguino, 2015). Previous studies differentiated energy poverty from fuel poverty (Thomson et al., 2016). The former was primarily employed when referring to a lack of access to modern energy services or energy infrastructure in developing countries (González-Eguino, 2015; Nussbaumer et al., 2012; Pereira et al., 2010). The latter term is still commonly used to refer to a problem of warmth affordability in developed countries (Anagnostopoulos et al., 2016; Boardman, 1991; Ormandy & Ezratty, 2012). In recent years, particularly after the 2010s, the terms have typically been used to mean the same, as the shared concept of domestic energy deprivation gained pace (Bouzarovski et al., 2021; Bouzarovski & Petrova, 2015; Day et al., 2016)[3]. Additionally, the terms used may vary and be used interchangeably. Some authors use the term "energy insecurity" (Hernández, 2016; Hernández & Siegel, 2019), or "energy stress" (ACOSS, 2018; Azpitarte et al., 2016), or "energy impoverishment" (Chester, 2014), or "energy hardship" (McKague et al., 2016; Nelson et al.,

[3] Having said that, this thesis addresses energy poverty as it is manifest in more developed regions. The context, causes, impacts, and indicators of energy poverty are somewhat different in Low and Low Middle-Income Countries (LMICs).

2019; Simshauser & Nelson, 2012). In this study, I refer to energy poverty as encompassing all energy services in the home.

Currently, there is no unanimous definition for energy poverty or agreement on what it means to be in energy poverty (Culver, 2017). This is not surprising as there are a myriad of spatial, temporal, social, economic, cultural, political and environmental factors that contribute to different aspects of energy poverty and how it is experienced by households. Incorporating some of those complex nuances, Reddy (2000, p. 44) defined energy poverty as the absence of sufficient choice and inability to access,

> *Adequate, affordable, reliable, high-quality, safe and environmentally benign energy services to support economic and human development.*

This definition, besides being one of the few that incorporates the environmental aspect of energy poverty, also reflects the lack of agency and capabilities[4] (see Nussbaum, 2000; Sen, 1993) experienced by energy poor households that impede them from moving out of it (Chipango, 2021; Middlemiss et al., 2019). It also stresses the idea of energy services to support development and wellbeing, a concept that has been further developed by other researchers (Amin et al., 2020; Day et al., 2016; Frigo et al., 2021).

Adopting a more contemporary and broad definition, energy poverty can be understood as a household's inability to secure a socially and materially required level of energy services (from electricity, gas and other fuel sources) in the home (Bouzarovski & Petrova, 2015; Simcock et al., 2018). This definition accords with the Energy Poverty Observatory[5] (EPOV) definition. According to the EPOV (2019), energy poverty occurs "when a household suffers from a lack of adequate essential energy services in the home", being: adequate warmth, cooling, lighting and the energy to power appliances – all essential to guarantee a "decent standard of living and citizens' health". In advanced economies this inability would be primarily due to not having the financial resources required.

Recent studies (Alem & Demeke, 2020; Kerr et al., 2019; Papada & Kaliampakos, 2019; VCOSS, 2018) have attempted to develop and expand our understanding of the emerging concept of energy vulnerability, highlighting that energy poverty can be either an intermittent or persistent situation, depending on housing, social, political and/or economic circumstances.

[4] The concept of capabilities is discussed in detail in Chapter 3.
[5] Part of the European Commission's policy efforts to address energy poverty across European Union countries.

Bouzarovski et al. (2014) stress that energy vulnerability factors may be related not only to access, affordability and energy efficiency, but also to questions of flexibility of energy sources and services, and households' energy needs and practices. Therefore, as Halkos and Gkampoura (2021) emphasise, energy vulnerability studies tend to take a more predictive approach in determining the sections of community—usually through dimensions of inequality and/or deprivileged social characteristics—that may be experiencing or are on the verge of experiencing energy poverty or hardship. As Bouzarovski et al. 2018 (in Simcock et al., 2018, p. 3) conclude:

> *Energy vulnerability thinking operates with risks and probabilities, because they express the likelihood of becoming energy poor [and] is closely connected to approaches that focus on how the demand for energy services in the home is constructed via, and embedded in, a much wider set of socio-technical relations.*

Likewise, some studies use the term domestic energy deprivation (Bouzarovski & Petrova, 2015; Marchand et al., 2019) to consider broader relations with capabilities and affordability (Acharya & Sadath, 2019; Frigo et al., 2021; Kearns et al., 2019; Nussbaum, 2003; Sen, 1992). In some cases, households may be energy-poor because they are primarily capability-poor (Chipango, 2021). Conversely, energy poverty may result in capability deprivation; in their conceptualisation of energy poverty, Day et al. (2016, p. 260) suggest that, when thinking about the varied energy uses and needs, energy poverty can be defined as:

> *An inability to realise essential capabilities as a direct or indirect result of insufficient access to affordable, reliable and safe energy services, and taking into account available reasonable alternative means of realising these capabilities.*

Again, the mention of the insufficient access and the inability to realise capabilities resemble Reddy's (2000) definition and the absence of sufficient choice. On this matter, researchers have conceptualised energy poverty as an expression of injustice (Heffron & McCauley, 2017; LaBelle, 2017; Melin et al., 2021; Waitt & Harada, 2019), recognising that it is fundamentally a problem of distributional inequalities (Walker & Day, 2012).

Deeply grounded in environmental and social justice movements (LaBelle, 2017), the term energy justice emerged premised on three tenets—distributional justice, procedural justice and justice as recognition (Day, 2021; McCauley et al., 2013). Besides the commonly acknowledged former issue of distributional injustices, recent studies investigate the role of institutions, such as the Ombudsman, in creating and ensuring policies for procedural energy

justice (Stojilovska, 2021), and how justice as recognition can be an important means for achieving recognition of energy vulnerability (Willand & Horne, 2018). Sovacool and Dworkin (2015) developed the energy justice framework—and, therefore, propositions for energy poverty policies—around principles of availability, affordability, due process, transparency, responsibility and accountability, sustainability, and intra- and inter-generational equity.

Similarly, the term energy democracy (Giancatarino, 2013) has gained traction among energy poverty researchers. Particularly in the context of renewable energy transitions, energy democracy calls for inclusive, equitable and low carbon energy systems, where political power and decision making processes are decentralised, and consumers can become prosumers, i.e., producers, consumers, owners, and decision-makers, around the energy future (van Veelen & van der Horst, 2018).

While all definitions presented reflect the unanimity between researchers that energy poverty involves many contributing factors and occurs in various dimensions, they reveal the lack of agreement and the challenging task of deciding on what and how to measure and track energy poverty (Castaño-Rosa et al., 2019; Primc & Slabe-Erker, 2020; Tirado-Herrero, 2017), a crucial aspect for tackling it at a larger scale. Boardman (2012) argues that many of the official national definitions are outlined for monitoring purposes only (mostly quantitative, as will be explored in Chapter 2), but not for facilitating a common understanding for delivering solutions and practical interventions in policy. Therefore, there is a need for a comprehensive conceptualisation of energy poverty that encompasses its causes, its impacts, how to measure it and, more importantly, how to fight it.

1.3 Energy poverty in Australia, older people and housing[6]

In Australia, the setting for this research, energy poverty is a major issue for many low-income households (Chai et al., 2021; Churchill & Smyth, 2021; KPMG, 2017). A survey in 2018, based on a sample of 1000 people, found that electricity remains the primary cost of living concern for Australian households. It was ranked above private health, mortgages, and food and groceries (ACOSS, PCA & EEC, 2018). A study in 2016, estimated that low-income households (defined as households in the bottom 40% of Australia's income distribution) spent

[6] Parts of this section have been previously published in Porto Valente et al. (2021).

12.4% of their weekly income on utility bills and fuel, whereas high income households spent 2.9% (Cornwell et al., 2016). During the COVID-19 pandemic, household energy debt increased by 21% to $AU124 million between March and November 2020 (Curtis, 2020). At the beginning of March 2021, the Australian Energy Regulator (AER) concluded that 130,000 electricity customers were in debt and the average debt was $AU1,151 (AER, 2021b).

A particularly vulnerable group are older people (over 65 years of age) who are reliant solely on the government Age Pension for their income. Besides usually spending more time at home, which can affect energy consumption and needs (see Day, 2015; Legendre & Ricci, 2015; Marmot Review Team, 2011), there is the income factor. The weekly government full Age Pension (including supplements) in January 2022 for a person living by themselves was $483[7]. The Age Pension is the main source of income for 56.9% of older Australians (ABS, 2019b)[8]. Dependency on the government Age Pension increases with age (ABS, 2016b), and older people with disability are more likely to rely primarily on the government pension than those without disability (ABS, 2019b). According to the annual Household, Income and Labour Dynamics in Australia (HILDA) survey, poverty rates among older single people and older couples have been consistently higher than any other household type (Wilkins et al. 2020). The Australian Bureau of Statistics (ABS, 2019b) indicated that two-thirds (68.1%) of older Australians live in a low-income household. Often older households can be income-poor but relatively asset-rich: older Australians have higher rates of home ownership than other age groups, and this asset provides a key financial security on retirement (AIHW, 2021c). However, apart from the fact that retired households dependent solely on the government Age Pension have lower levels of wealth compared to those reliant on investment income or superannuation (ABS, 2022), housing wealth is not particularly relevant when it comes to energy affordability. An Australian study estimated more than one-third of households identified as energy-poor have a reference person aged 65 years or above (Azpitarte et al., 2015).

Energy poverty has a range of impacts and older people, particularly if they have health issues and limited income, are especially susceptible[9]. Recently, studies have focused on older

[7] The Melbourne Institute's well-recognised poverty line for a single person (not in the workforce) in December 2020 was $465 a week, including housing (The Melbourne Institute, 2021).
[8] In June 2020, 4.188 million people, 16.3% of Australia's population, were aged 65 years and over (ABS, 2020).
[9] Chapter 2 presents in more detail the impacts of energy poverty that include, among others: food insecurity, inability to purchase essential items, poorer health and wellbeing, and social exclusion.

people's lived experience of energy poverty and their coping mechanisms (Chard & Walker, 2016; Willand et al., 2017), which often relate closely to their housing conditions and energy (in)efficiency, and household energy practices. Adding to that, there is the national problem of a very poor energy efficient housing stock; Australia has been a very slow adopter of energy efficiency requirements, and the current minimum standards still fail to reflect international benchmarking regulatory practices (Berry & Marker, 2015; Horne et al., 2005), such as the EU Directive on the decarbonisation of buildings by 2050 (European Parliament, 2018). Presently, many OECD (Organisation for Economic Cooperation and Development) members are proposing to increase standards towards a net zero energy or net zero carbon performance level (Global Alliance for Buildings and Construction et al., 2019; Thonipara et al., 2019; World Green Building Council, 2020). Australia's minimum energy efficiency requirements, however, have not changed in over ten years, and current standards are not set to cope with climate change and accompanying temperature extremes (Audit Office of New South Wales, 2021).

The Nationwide House Energy Rating Scheme (NatHERS) assessments are the most common way to meet the minimum energy efficiency requirements of the Australian National Construction Code. Ratings range from 0 to 10 stars (Department of Industry, Science, Energy and Resources, 2021). A 0-star rating means that the building envelope does little to reduce the discomfort caused by hot or cold temperatures. At present—and since 2010—, a 6-star rating is the minimum standard for new homes in Australia and indicates good, but not outstanding, thermal performance. Minimum energy efficiency standards for residential property were only mandated in the Building Code of Australia in 2006. This is significant as studies indicate that much of the housing stock built before 2006 has a star rating of 2 stars or less (Berry & Marker, 2015; Sustainability Victoria, 2014; Willand et al., 2019).

Unlike new homes, there is no requirement or incentive to improve the energy efficiency of existing homes, and in a recent open letter to Energy Ministers about energy efficiency and housing, forty organisations, including the Australian Council of Social Service (ACOSS), the Council on the Ageing (COTA) and the Climate and Health Alliance (CAHA), urged for measures to improve the energy efficiency of existing homes (ACOSS, 2019b) to reduce the size of energy bills and the risk of homelessness. The letter stated,

> *The poor energy performance of many homes in Australia, combined with significant rises in energy costs over the past decade, and increasingly extreme weather fuelled by the climate crisis, means that a significant and growing proportion of the population*

are now living in homes that are unaffordable to run, and are too cold in winter and too hot in summer (ACOSS, 2019b).

Adequate housing is integral to people's wellbeing, and the prevalence of poor-quality and poor-energy efficient housing in Australia affects households differently. The negative impacts on health and wellbeing, as well as the financial burden of maintaining and repairing these dwellings are much worse for low-income households (Liu et al., 2019). Particularly for older people, inequities in housing quality and the ability to deal with household financial issues are critical health issues (Howden-Chapman et al., 2011). Housing defects and problems such as leaky roofs, structural issues, chronic dampness, improperly vented and inadequate appliances, and poor ventilation can cause poisoning, injury, illness, and increased energy consumption, particularly in homes with children and older adults (Kuholski et al., 2010).

The Australian Housing Conditions Dataset (AHCD[10]) which is based on a sample of 4501 households, including 1999 households with a household head aged 65 or over, found that 78% of homes of older Australians were at least 25 years old, which means these homes do not necessarily meet minimum energy efficiency standards. Current renovation rates to residential buildings are still low and comprise only 9.4% of the total value of building works done in Australia (ABS, 2021). While the opportunities for significant household and societal benefits from residential energy efficiency retrofits are immense, the upfront costs of upgrades are very difficult for many homeowners to realise on their own, particularly for older low-income households (Judson et al., 2019; Kuholski et al., 2010; Russell-Bennett et al., 2017). Thus, when advocating for housing energy efficiency in the context of energy poverty among older Australians, it is important to recognise that it is also concomitant with issues around "comfort in home (particularly thermal comfort), everyday practicalities, and issues of health and wellbeing" (Cooper et al., 2016, p. 40). Being energy efficient, comfortable, and keeping energy costs manageable is imperative for older Australians.

1.4 Energy poverty, climate change and older Australians[11]

"Ageing in place" – to live independently in their own homes for as long as possible – is a preference among older people in Australia (Demirbilek & Demirkan, 2004; Judd et al., 2010,

[10] The AHCD is discussed in detail in Chapter 4.
[11] Parts of this section have been previously published in Porto Valente et al. (2021).

2014). A consequence is that, as seen above, many older Australians are living in old homes that are not energy efficient (Romanach et al., 2017). People age in ageing homes, that besides not reflecting current codes of energy efficiency, also suffer from physical decline unless well-maintained. Poor maintenance and resultant decline impact on the energy efficiency of the home, and therefore, the households' energy expenditure (Liu et al., 2019). For older households, this also resonates with the issue of "living in an old house at an old age" (Roberts & Henwood, 2019): when issues of poor thermal comfort become harder to cope with (Dear & McMichael, 2011; Howden-Chapman et al., 2012; van Hoof et al., 2017). The homes concerned are difficult (and costly) to heat or cool adequately and are a challenge for older people who are less tolerant of extreme temperatures (van Hoof et al., 2017). This is increasingly becoming a serious issue, especially for older people on lower incomes, such as those reliant on the government Age Pension.

While previous research has found an established relationship between excess winter deaths (EWD), low thermal efficiency of housing and low indoor temperature during cold weather (Anderson et al., 2012; Hamza & Gilroy, 2011; Wright, 2004), more recent studies are now focusing on heat vulnerability—particularly among the older population—, heat mortality and summer energy poverty (Kollanus et al., 2021; Sanchez-Guevara et al., 2019; Thomson et al., 2019; Vicedo-Cabrera et al., 2021). Other health risks associated with thermal discomfort, such as cardiovascular and respiratory problems, have been accentuated by climate change (Borchers Arriagada et al., 2020; Campbell et al., 2018; Cheng et al., 2018; The Lancet, 2018).

Heatwaves are one of the most important climate-related risks for Australians (City of Sydney, 2016; Jyoteeshkumar reddy et al., 2021), and these are becoming more common and lasting longer (Steffen et al., 2014; Trancoso et al., 2020). In 2018/19, New South Wales (NSW), the state where Sydney is located, experienced the hottest summer on record – 3.41^{o}C above the average (Climate Council, 2020). On the 4th of January 2020, Penrith in outer Sydney, recorded the hottest day ever in the Sydney region – 48.9^{o}C (Australian Government, 2021). Climate change prediction models from five different institutions across the world[12] are unanimous in the temperature increase for the next decades and indicate that Sydneysiders will be very frequently experiencing moderate to strong heat stress during summer months

[12] The Met Office (UK), the Multi-institutional project funded by the Research Council of Norway, the Institut Pierre-Simon Laplace (France), the National Oceanic and Atmospheric Administration (USA), and the University of Tokyo (Japan).

(ClimateCHIP, 2019). Melbourne, in Victoria, is located in the southern end of the country. On the 31 January 2020, Laverton in Melbourne outer suburbs, recorded a temperature of 44.1°C. Sydney and Melbourne already experience periods of extreme heat. Simulations conducted by Lewis et al. (2017) indicated the possibility of these cities reaching unprecedented temperatures of 50°C under 2°C of global warming.

In buildings with poor thermal design and performance, extreme heat makes the dwelling very uncomfortable and potentially dangerous for frail occupants. Mechanical cooling is required to make the environment tolerable, which adds to energy costs. Clearly, to achieve temperatures in the maximum acceptable range of 25°C to 28°C (WHO, 2018b), households would need to use air conditioning extensively. Nevertheless, one frequent response due to the high cost of energy is to cut down on energy use and endeavour to cope with the consequences of high indoor temperatures (Sherriff et al., 2019; Thomson et al., 2019).

Over the past 100 years, heatwaves have caused more deaths than any other natural hazard in Australia, and their impacts might be even greater, as they are often under-the-radar compared to other extreme weather events (Australian Academy of Science, 2021; Steffen et al., 2014). Hospitalisations and emergency call-outs increase during heatwaves (Nitschke et al., 2011; Patel et al., 2019). Consequently, as Australia's population ages[13], the proportion and number of people at risk from heatwaves will continue to rise, increasing the pressure on emergency and health services (City of Sydney, 2016; Steffen et al., 2014), snowballing government costs on health care (Audit Office of New South Wales, 2021) and potentially exposing and further exacerbating existing inequities within the health system and in health outcomes (Blashki et al., 2011).

Heatwaves and extreme weather exacerbate the problem of energy poverty. In Sydney, even for homes in the cool-breezed eastern suburbs, it has been estimated that there will be a 70% increase in energy cooling requirements in 2030 compared with 2020, and a 300% increase by 2070 (Audit Office of New South Wales, 2021). Older Australians who rely entirely on income support (the government Age Pension) are more likely to struggle to cope with the economic burden associated with larger electricity bills for air conditioning (Chester & Morris, 2011; Nicholls et al., 2017). Many will decide to limit their use of air-conditioning (if they indeed

[13] According to the Australian Bureau of Statistics (2018b), by 2066, people aged 65 and over will constitute more than 20% of the population.

own an air-conditioner) as they would not be able to afford the cooling required to feel comfortable at home.

1.5 Problem statement and research aims

Despite energy poverty being identified by many nations as an important phenomenon contributing to material deprivation and disadvantage, it is still not adequately acknowledged and effectively engaged with by policymakers and scholars (Hernández, 2016; Liu et al., 2019; Willand et al., 2021). This emerging issue still needs researchers to raise awareness that millions of people struggle every day to meet basic household energy needs, such as keeping the lights on, cooking proper meals, or staying comfortable at home. As a complex phenomenon of multifaceted causes, effects and contextual factors, it also complicates the process of dealing with it at a government political level. In a broader context, Anagnostopoulos et al. (2016, p. 18) conclude,

> *Healthcare experts and politicians often understand the effect and the social costs of inadequate housing but they have no political tool to tackle the causes of the situation. Energy experts and politicians often see the problem of arrears on utility bills and the struggle of vulnerable consumers but they have limited power to influence household income. Social policy makers likewise see the gap between energy prices, income and quality of housing and they also realise that the usual measures might not be sufficient anymore.*

Besides presenting the disconnected political layers often partially involved in addressing the problem, this quote also reiterates the trilemma challenge, now being comprehended in terms of economics, politics and social sustainability dimensions in the energy policy framework (Heffron et al., 2015). Besides the European Union and the UK, where energy poverty eradication is included in the political agenda (Department of Energy and Climate Change, 2013; European Comission, 2020; Hills, 2012), few other developed countries recognise the problem as urgent. Australia, for example, lacks a federal-level acknowledgement of and action on energy poverty, with varying levels of recognition and research across states and territories. Furthermore, even though the UN recognises in their "Principles for Older Persons" (Randel et al., 2018) the key rights of access to adequate food, water and safe shelter and ensuring that the older population is able to live in dignity in their own homes for as long as possible, it seems energy poverty is jeopardising these basic rights

in many instances (Anderson et al., 2012; Day & Hitchings, 2011; De Vries & Blane, 2013; Rudge & Gilchrist, 2005; Waitt et al., 2016). Living in an energy inefficient home at an older age on low-income often means relinquishing living comfortably and renegotiating basic household routine practices, such as cooking, showering, watching TV or heating/cooling the dwelling (Chester, 2013; Roberts & Henwood, 2019).

Recent research efforts on how housing, energy and health policy and services can be better integrated to reduce energy vulnerability and improve households' wellbeing (Sherriff et al., 2020; Willand et al., 2021) concluded that, particularly for vulnerable household groups, health outcomes are considerably dependent on sufficient access to energy services. Nevertheless, energy poverty and the impact of homes that are not energy efficient is an under-researched area, especially in Australia. There is still limited understanding of the consequences of substantial increases in household energy prices in Australia (AEMO, 2019; Chester, 2013) for low-income pensioners. It is critical that research examines how Australian Age Pensioners experience and cope with energy poverty and how it affects their health and wellbeing. This study addresses this gap in the literature.

Furthermore, research on energy poverty and older people has focused predominantly on patterns of mortality and morbidity in winter (Chard & Walker, 2016; Day & Hitchings, 2011; Willand & Horne, 2018). The materiality and the poor energy efficiency of the homes shape the lifestyles (and subsequent energy consumption and expenditure) of these households (Roberts & Henwood, 2019) throughout the whole year. However, understanding Age Pensioners' energy-related routines, their ability to adapt household activities, and their negotiable and non-negotiable practices towards energy consumption remains under-researched (Judson et al., 2019). Energy consuming practices matter to people in specific ways, and as people age, new circumstances will change these practices (Roberts & Henwood, 2019).

Poor energy efficient homes waste energy and potentially affect their occupants' health and wellbeing (Dear & McMichael, 2011; Howden-Chapman et al., 2012). Rising energy costs and climate change will increase household energy expenditure in future decades, widening and accentuating energy poverty for the aged population group. Despite researchers' efforts, it is still a challenge to determine policies and regulations to assist vulnerable consumers in overcoming energy poverty (Anagnostopoulos et al., 2016; Bouzarovski et al., 2021). The increasing impacts of extreme weather events and the health issues associated with an ageing population will likely contribute to a broader public health crisis, with increased hospital

admissions and greater mortality rates (City of Sydney, 2018). Therefore, the primary aim of this study is to explore energy poverty among a particular energy vulnerable household group: older Australians on low incomes. This study intends to describe the housing condition and energy poverty related hardship of older Australians reliant on government income support, and to document the lived experience of energy poverty among older Australians reliant on government income support in the Greater Sydney area. In this sense, this thesis enables a deeper understanding of the extent of energy poverty among Australian Age Pensioners, what factors shape their lived experience of energy poverty, how their personal history, circumstances and current housing conditions might contribute to their energy-poor situation and what are the main impacts of energy poverty on their quality of life and wellbeing.

1.6 Research questions

Despite energy poverty being an emerging issue, it is under-researched in Australia (ACOSS, 2018; Nelson et al., 2019; VCOSS, 2018). Few studies have been undertaken to provide robust evidence on the energy-poor households' lived experience and what pushes them into this situation. Moreover, older households deserve special attention when it comes to the consequences of living in energy poverty. In general, the impacts of energy poverty are almost exclusively connected to thermal discomfort in winter – ignoring a broader understanding of the vast health and wellbeing implications. There is more to be exposed on the specific causes and impacts of energy poverty in the Australian context. Unravelling these contextual factors are likely to assist the development of more effective policies towards alleviating energy hardship.

Therefore, the main research question guiding this study is; *How is energy poverty understood and experienced by older Australians reliant on government income support*? In order to break down this main question into smaller and achievable goals, four derived questions are put forward:

1. To what extent do older Australians reliant on government income support suffer from energy poverty?
2. What are the current housing conditions of older Australians reliant on government income support and how might they shape their experience of energy poverty?

3. What are the main causes of energy poverty among older Australians reliant on government income support?
4. What is the impact of energy poverty on older Australians reliant on government income support?

1.7 Research approach and scope of study

Examining energy poverty in Australia and understanding its impacts on older low-income households will contribute not only to the scholarly literature but to "real-world" solutions to mitigate it. With this practical perspective in mind, there is a concern about the translation of research into practice (Glasgow, 2013), i.e., the pragmatic application of scientific findings. In exploratory research such as the present study, there is a need for flexibility in the research design, as slight changes might be required once new information and insights emerge. Hence, in order to answer the research questions outlined above, this research used a mixed methods research approach.

Mixed methods research can integrate qualitative and quantitative research approaches to offer multiple viewpoints to the same research problem (Baran & Jones, 2016; Creswell & Clark, 2018). This, in turn, enables the researcher to develop a deeper understanding of the issue and enhances the validity of the findings, as weaknesses in one particular approach are counterbalanced by strengths in another approach (Creswell & Creswell, 2018; Singleton & Straits, 2018).

A quantitative analysis over secondary survey datasets enabled a more generic understanding of the extent of energy poverty among older households and the housing conditions that might contribute to it. To complement it, a qualitative analysis over primary data obtained by in-depth semi-structured interviews presented the opportunity to include the voices of those who suffered from energy poverty. Their different perspectives on the factors that shape the experience of energy poverty added original insights into the study. For the qualitative data analysis, I employed Pierre Bourdieu's (1990b) concepts, such as capital and habitus, to examine the main causes and impacts of energy poverty. To investigate how energy poverty affects older households' capabilities and wellbeing, I drew on Amartya Sen and Martha Nussbaum's capabilities framework (Nussbaum, 2000; Sen, 1993).

The scope of the study is mainly restricted by timeframe and location. Data collection and analysis happened between the end of 2019 and early-2021, coinciding with the COVID-19 outbreak. While the quantitative analysis was primarily based on the Australian Housing Conditions Dataset, complementing information from the Australian Bureau of Statistics (ABS) and the HILDA dataset are used for comparison. The AHCD includes information on households' characteristics and dwelling conditions from three Australian states: New South Wales, Victoria and South Australia.

Primary qualitative data collection was severely affected by the COVID-19 pandemic, as explained in subsequent chapters. In regard to geography, most of the 23 interviewees were from Greater Sydney, Australia's largest city. Three interviewees were from Melbourne, Australia's second largest city. Both cities are subject to extreme heat, and at least half of the interviewees had experienced extreme weather events. The empirical study targeted older households (those aged 65 years old and above) in low-income situations (usually primarily or mainly dependent on the government Age Pension), as previous studies suggest this group is particularly vulnerable to energy poverty (Azpitarte et al., 2015; Nance, 2013; Willand & Horne, 2018). Given the diversity of Australia's eight climate zones and the significance of the climate in shaping the experience and consequences of energy poverty, I acknowledge that the qualitative findings are somewhat confined to the geographical boundaries of the study. Nevertheless, the commonality of themes drawn from the interviews and the assessment of external validity suggest a degree of generalisability with respect to drivers and impacts of energy poverty on older peoples' quality of life, health and wellbeing.

1.8 Significance of study and contribution to knowledge

In the current context of energy transitions in a changing climate, understanding energy poverty, its causes and its impacts is crucial if governments and other relevant bodies aim to correctly identify energy vulnerable households and put in place effective solutions. In Australia, energy poverty affects hundreds of thousands of households and few studies have investigated the topic in detail. Overall, the originality and research contributions of this study comprise three areas: empirical, theoretical and policy implications.

There are important empirical contributions to be acknowledged. Firstly, this is the first PhD research in Australia focused solely on exploring the lived experience and the diverse

nuances of energy poverty (not only related to winter temperatures) in different housing tenures among older low-income households. As distinct vulnerable groups may experience energy poverty in different ways (i.e., from a different combination of drivers and different perceived impacts), studying them individually and in detail allows for the recommendation of targeted solutions.

The study contributes to the literature on the detrimental effects of energy poverty beyond the exposure to cold indoor temperature (Baudaux et al., 2019; McKague et al., 2016), and explores the precarious situation associated with the deprivation of other important energy services—such as cooking, showering and entertaining—throughout the whole year. This research exposes how energy poverty affects older peoples' capabilities, expanding the discussion in Australia. It also adds to the growing concern on the overlap between heat vulnerable households and energy vulnerable households; older people on low incomes are particularly vulnerable to both (Nicholls et al., 2017).

Moreover, this research adds to the broader emerging literature on the contextual factors that push households into energy poverty (Robinson et al., 2018b; Simcock et al., 2018) beyond the well-known triad of low incomes, poor energy efficient homes and high energy costs. Lastly, this research offers a significant contribution into the COVID-19 pandemic unintended consequences on energy vulnerability. Lockdown measures and restrictions not only affected energy consumption patterns at home, and consequentially, energy costs, but also energy-poor households' capacity to cope.

With respect to the theoretical contributions, this research offers a new way of analysing energy poverty. To draw more conceptual insights from the primary rich qualitative data obtained with the in-depth interviews about older energy-poor households' lived experience and how this shaped and was shaped by their circumstance of energy hardship, I utilised a theoretical framework that combined Bourdieu's theory of practice and Sen's and Nussbaum's capabilities approach. This thesis demonstrates how Bourdieu's (1977, 1990b) conceptual framework (habitus, capital and field) can be used to understand energy poverty and the broader energy system, including the neoliberal market mechanisms. Furthermore, this research adds to the growing body of literature that engages with energy poverty and utilises the capabilities approach to understand its impacts (Day et al., 2016; Melin et al., 2021; Middlemiss et al., 2019; Willand et al., 2021). It provides further evidence of how energy

poverty and the housing conditions of older low-income Australians affect their secondary and central capabilities.

Besides empirical and theoretical contributions, this research offers practical recommendations based on the study findings with respect to developing more effective ways to recognise and combat energy poverty in Australia. The findings in this study provide insights into how policy frameworks can improve capabilities of older Australians to overcome the effects of energy poverty.

1.9 Structure of thesis

This thesis is organised in nine chapters. Following the contextualisation and definition of energy poverty presented in this first chapter, *Chapter 2* continues the literature review about the main causes, impacts, potential solutions, and policy guidelines to alleviate energy poverty. It also presents the main indicators of energy poverty and how past and current studies measure energy poverty in Australia and overseas.

Chapter 3 maps the theoretical framework chosen to interpret the data through a novel perspective. I use Bourdieu's concepts of field, capital, habitus, and symbolic violence to make sense of the Australian energy market and how energy poor older Australians' lack of different forms of capital shape their experience of energy poverty. Complementing Bourdieu's theory, I draw on Sen and Nussbaum's capabilities framework to investigate how energy poverty compromises the capacity of older Australians to lead a decent life.

Chapter 4 discusses the research methodology, including the ontological and epistemological stances adopted to justify the mixed-methods strategy of inquiry and the qualitative and quantitative data collection and analysis procedures. A pragmatist approach towards the exploration of "real-world" problems and solutions grants the required flexibility in the choice of method and analysis.

Chapters 5 to 8 address the findings and discussion of this research. *Chapter 5* focuses on the extent of energy poverty among Age Pensioners and examines their socio-economic and demographic characteristics. It also reports their main housing conditions according to the recently published Australian Housing Conditions Dataset.

Chapters 6 and 7 complement each other by providing an account of the main causes of energy poverty among older Australians. While *Chapter 6* explores the mainly economic-

related causes, including their low-income situation, the issue of unexpected expenses and the high energy costs due to a variety of reasons, *Chapter 7* discusses other main contributors associated with issues of energy literacy, digital inclusion and computer literacy, social relations and gender aspects. This chapter also examines how the COVID-19 pandemic aggravated energy poverty among older Australians.

Chapter 8 investigates the main impacts of energy poverty among this vulnerable group of households. The consequences of energy poverty go beyond the restrictions on energy consumption or late bill payments. Accounts of food insecurity, inability to purchase other essential items, decline in physical and mental health, social isolation and negative feelings of shame and embarrassment portray a very difficult life of compromised capabilities and poor wellbeing among energy-poor older households.

Chapter 9 concludes the thesis. After restating the research questions and the research methods chosen, this chapter provides a summary of the main findings and presents the key research contributions, in terms of empirical findings, theory advancement and insights on practical implications. Research limitations are acknowledged and ideas for a future research agenda are put forward. The chapter ends with a personal reflexivity exercise on the research process.

1.10 Conclusions

Faced with predictions of resource scarcity and climate change impacts in the near future, governments and the global energy sector need to address three big challenges–increased demand for energy security and infrastructure reliability in uncertain scenarios, the urgent need for a clean energy transition towards low-carbon energy sources and energy efficiency, and ensuring the accessibility and affordability of energy supply across the population (IPCC, 2021; McCauley, 2018; WEC, 2020). Referring to the latter, energy poverty, as it is manifest in more developed nations, affects millions of people and is the product of three main factors: the cost of energy for essential needs relative to income, the energy efficiency of the home and the household income (Boardman, 2010; Simcock et al., 2018). The issue is largely overlooked in Australia, and the precarious situation of energy poor households is under-researched (Chester, 2014; Daniel et al., 2020; Nance, 2013). Unless there are major interventions, rising energy costs and climate change are likely to increase household

energy expenditure in the future widening and accentuating the problem. Living in poor indoor environmental conditions due to energy poverty is a health risk (see Jessel et al., 2019; Robić & Ančić, 2018; van Hoof et al., 2017) especially for older people (those aged 65 years and over), who constitute a growing proportion of the population, especially in advanced economies (Leeson, 2018; Lutz et al., 2008). Low-income older households are among the most vulnerable to energy poverty.

The present study aims to explore energy poverty among older Australians on low incomes in order to understand the extent of the issue among this group, and its main contributing factors. A particular focus is given on how energy poverty affects Age Pensioners' capabilities to lead a decent life. With contributions that add to the emergent literature of energy poverty in Australia and broader theory advancement, this research offers insights into better policy frameworks and potential solutions to alleviate energy poverty.

Chapter 2 A Review of Energy Poverty

Introduction

Defining energy poverty directly influences how one decides to measure it. This is the focus of Section 2.1, where I discuss the main objective and subjective measures of energy poverty. The differences between the measured, perceived and hidden aspects of energy poverty are discussed and add to the challenge of getting an accurate and useful measurement of this socio-economic problem in national and global scales. Subsequent sections address the main causes (Section 2.2), impacts (Section 2.3) and potential solutions to energy poverty (Section 2.4), revealing the gaps in the current literature, especially for older households in Australia. The chapter ends with a brief summary of the literature review and concluding remarks in Section 2.5.

2.1 Measuring energy poverty

The definition of energy poverty that one adopts affects how one decides to measure it (Culver, 2017). If there is a greater focus on accessibility to modern and safer energy sources and infrastructure, common in developing countries, one might measure the households' access to electricity, modern cooking fuel sources, and ownership of appliances (Abbas et al., 2021; Nussbaumer et al., 2012; Zhang et al., 2021). For energy poverty research in developed countries (mostly in Europe, with limited studies elsewhere), the emphasis is usually on assessing the affordability of energy costs, particularly in winter (Hills, 2012; Thomson & Snell, 2013; Tirado-Herrero, 2017), despite the growing evidence of greater cooling needs and other capability-enhancing energy services, such as information and communication (Day, 2021; Nicholls & Strengers, 2018; Thomson et al., 2019; Walker et al., 2016).

Several measurable drivers and outcomes of energy poverty can be utilised (summarised in Table 2.1) and combined to estimate its incidence and severity (Anagnostopoulos et al., 2016; Thomson et al., 2017). In the first column of Table 2.1, common measurable drivers include the proportion of energy costs in relation to the household income, for example. Additional energy needs can be assessed in case of health conditions or disability, and tenure type can offer insights into the diverse situation of disposable income after housing

costs between homeowners and renters. In the second column, common measurable outcomes incorporate energy debt and inability to heat or cool the home adequately. Poor indoor air quality measures give an idea of the relationship between energy poverty and respiratory issues, and worsened physical and mental health measures indicate the broader impacts of energy poverty on households' wellbeing.

Table 2.1 - Measurable energy poverty drivers and outcomes from an advanced economy perspective

Measurable energy poverty drivers	Measurable energy poverty outcomes
Energy costs	Inadequate access to affordable energy sources and providers
Choice of energy providers and sources	Poor indoor air quality, i.e., damp and mould
Energy inefficient housing/equipment	Deterioration of built fabric and worsened energy performance
Household income	Arrears and energy debt
Tenure type	Worsened physical and mental health
Additional energy needs	Inability to heat and cool home adequately
Under-occupancy	Rationing of other energy services (e.g., lighting, cooking)
Household type	Low take-up of support schemes
	Unjust pricing

(Source: Adapted from Anagnostopoulos et al., 2016)

Although there are a range of drivers and outcomes, most energy poverty measures fall into three general approaches (Boardman, 2010; Hills, 2011; Legendre & Ricci, 2015; Robinson et al., 2018a; Tirado-Herrero, 2017):

1. *Direct measurements* – where the level of energy services (usually heating) achieved in the home is compared to a set standard or modelled energy requirement (Daniel et al., 2019; McDowell et al., 2017; Willand et al., 2019), such as the measurement of indoor temperatures against WHO guidelines (2018b);
2. *Income/expenditure approaches* – which explores the ratio between the actual or required energy expenditure and the household income, in comparison to certain absolute or relative thresholds of an energy poverty line. The most prominent and benchmarked examples come from the UK official energy poverty statistics: the established 10% indicator with respect to the required energy expenditure to achieve a modelled level of thermal comfort (Boardman, 1991, 2010) and the Low-Income/High-Cost (LIHC) indicator (Hills, 2012; Robinson et al., 2018a);
3. *Consensual approaches* – refers to consensus about what should be affordable or achievable regarding energy consumption and is often based on the household's self-assessment and self-reported ability to achieve certain basic energy necessities, such as the ability to warm/cool the home adequately, pay bills on time or the presence of

a leaking roof, damp walls, floors, etc. Most national household surveys—including Australia with the HILDA survey (The Melbourne Institute, 2021) and the Household Expenditure Survey (ABS, 2016b)—incorporate consensual measures as general deprivation indicators, based on Townsend's (1979) work.

For each of the three main approaches, there are strengths and limitations that are discussed in detail in the works of Herrero (2017), Thomson et al. (2017), and Siksnelyte-Butkiene et al. (2021). Firstly, direct measurement approaches are usually costly, labour intensive and time consuming, preventing the analysis to be performed on a large scale (Daniel et al., 2019; Waitt et al., 2016). With respect to income/expenditure indicators, in summary, even though usually considered an objective approach, they do require numerous subjective assumptions, decisions and data transformations from the analysts related to the use of "actual vs. required energy expenditures, the equivalisation of household income and energy expenses, the consideration of housing costs and the choice of an energy poverty line" (Tirado-Herrero, 2017, p. 1029). On the other hand, the subjectivity of the consensual indicators, which for some can be seen as a strength, as it is a bottom-up approach (Middlemiss & Gillard, 2015) that empowers the household to self-assess its condition irrespective of energy costs, has also been criticised for the potential error of exclusion, "whereby households may not identify themselves as energy poor even though they may be characterised as energy poor under other measures" (Thomson et al., 2017, p. 885).

Consequently, there is no single definitive solution to measuring energy poverty and scholars usually defend the use of multiple or composite measures (with or without specific weights) to try and capture the multidimensional aspects of energy poverty and properly identify all household types that need most support (Abbas et al., 2021; Acharya & Sadath, 2019; Gouveia et al., 2019; Llorca et al., 2020; Okushima, 2017; Siksnelyte-Butkiene et al., 2021). In this sense, qualitative data on the lived experience of energy poverty has much to add to the varied energy services that are compromised—besides the typical emphasis on heating—and how surveys can incorporate those into measurable attributes and a composite index (Baudaux et al., 2019; Longhurst & Hargreaves, 2019; Waitt et al., 2016).

In Australia, the most utilised national survey for measurement of energy poverty is the annual HILDA survey, which is funded by the Australian Government through the Department of Social Services and designed and managed by the Melbourne Institute which is linked to the

University of Melbourne. Recent studies have used HILDA to assess the extent of energy poverty nationally, regionally and/or its correlation with other issues, such as health effects or ethnic diversity (Azpitarte et al., 2015; Churchill & Smyth, 2020, 2021; VCOSS, 2018).

From the HILDA survey, it is possible to examine both income/expenditure and consensual approaches. One of the seminal assessments of the extent of energy poverty in Australia is the study conducted by Azpitarte et al. (2015), which used five indicators of energy poverty using the HILDA data, as seen below in Table 2.2:

Table 2.2 - Indicators of energy poverty used by Azpitarte et al. (2015)

Income-expenditure measures	
Low Income – High Cost (LIHC)	Identifies households who have actual fuel costs above the median level and a residual income after energy expenses below the official poverty line (following Hills, 2012)
Cost–income ratio > 10%	Identifies households whose actual energy costs exceed 10% of their income (following Boardman, 1991).
Cost–income ratio > 2x median ratio	Identifies households whose actual energy costs exceed twice the median cost-to-income ratio (following Moore, 2012).
Consensual measures	
Unable to heat the home	Identifies households who state they are unable to heat their home (following Thomson & Snell, 2013)
Could not pay bills on time	Identifies households who state they cannot pay their electricity, gas or telephone bills on time *(combined – there is no distinction to the bills)*

As expected, the different energy poverty indicators captured very different groups of households in this study, which ultimately influence policy priorities. Low-income households with high energy expenditure had a higher proportion of older people (65 years old and over) who owned their home and were out of the labour force; and households who were unable to pay their bills on time or who were unable to heat their home had a high proportion of single or dual parent households with one or more children, who were either renting or paying off a mortgage. Azpitarte et al. (2015) concluded that 29% of Australian households experienced energy poverty to varying degrees.

Interestingly, the study conducted by VCOSS (2018) utilised only the consensual approaches for a measure of persistent energy poverty, in which households were identified as being in energy poverty if they experienced payment difficulty and/or heating inability in any two years, or all three years, of the three-year period analysed (between 2014 and 2016). The VCOSS study showed that 7.5% of Australian households experience persistent payment difficulty and 1.6% experienced persistent heating inability. Most strikingly, the majority (54%)

of households with persistent heating inability did not report persistent payment difficulty, producing more evidence on the varied nuances of the experience of energy hardship and how it can be often hidden or disguised from government, energy retailers and community services (Meyer et al., 2018).

Income/expenditure and consensual indicators are usually considered proxies for measured and perceived energy poverty, respectively (Meyer et al., 2018; Thomson et al., 2017). Nevertheless, hidden energy poverty, especially among older low-income households, can occur when people fail to recognise their own deprivation situation either due to lower expectations (and adaptation) from long-term poverty, and denial or shame to admit they are struggling (Dominy & Kempson, 2006; Eisfeld & Seebauer, 2020; Eurostat, 2009). Qualitative studies have shown that some energy-poor households go to great lengths to hide their predicament, even from close friends and family, and particularly from surveys, authorities, health and support services (Daniel et al., 2020; Grossmann et al., 2021; Longhurst & Hargreaves, 2019). To try and tackle this problem, indicators have been recently devised to capture households whose energy expenditures are too low[14] (thresholds vary, but usually around half the expenses) when compared to energy expenses of similar households (Meyer et al., 2018; Trinomics, 2016). Hence, this approach identifies those who are cutting back on energy use to reduce their costs. Studies using the 2017 European Union Statistics on Income and Living Conditions (EU-SILC) indicated that almost a quarter of the Central and Eastern European population is exposed to hidden energy poverty (Karpinska & Śmiech, 2020), but there is still a need for further research on hidden energy poverty in Australia. The understanding of the aspects of hidden energy poverty among older Australians is particularly limited, with few studies acknowledging resilient adaptation practices (Willand et al., 2017) and the “tyranny of thrift” (Waitt et al., 2016). Besides a research challenge that requires deep qualitative study, this is a research gap in Australia which the present study and methodological approach can shed light on.

Other recent Australian studies have used alternative data sources. Nelson et al. (2019), in order to understand the main drivers of energy poverty, analysed data of around 31,000 customers obtained from AGL Energy Ltd, one of Australia's largest electricity and gas retailers,

[14] When there is available data, households living in well-insulated dwellings are excluded from the calculation, to avoid the confusion of low energy costs due to high energy efficiency (Meyer et al., 2018).

on the key statistics related to AGL's hardship program. They found out that those in low-income situations (often reliant upon government income support), family or group households (i.e., large household size), and those with higher-than-average energy consumption were more likely to enter the energy hardship program. Moreover, the average payment plan was not sufficient to meet their billed consumption, which means it was unlikely that they could pay off the energy debt. Other studies (Liu et al., 2019) have used the recently published and publicly available AHCD (Baker et al., 2019), which includes summer related consensual measures of energy poverty (ability to keep comfortably cool in summer). Other less broader surveys conducted by NGOs and advocating institutions also include questions on energy hardship (Cornwell et al., 2016; COTA, 2018; NCOSS, 2017; QCOSS, 2017).

The Household Expenditure Survey data from ABS (2016b) is a relevant source, featuring key information about household spending—including domestic energy and fuel—, and income based on various characteristics. However, the survey frequency is every five years and as energy prices have changed dramatically (AEMC, 2020; AEMO, 2021a), the data soon becomes obsolete. Prior to that, in 2012, the ABS conducted a household investigation on energy consumption (ABS, 2012a), including energy costs, intentions, actions and barriers to energy efficiency improvements, and financial-related energy indicators. From a total sample of 11,978 households, it found nearly one in five low-income households (18%) could not pay their electricity, gas or telephone bills on time (compared to 5% of high-income households). In addition, actions to reduce energy costs, such as switching off appliances off at the wall, taking shorter showers, and using draft-proof seals on doors and windows, were more prevalent among low-income households. Lastly, the survey confirmed that homeowners had significantly higher rates of insulation, window treatments and solar electricity or hot water systems in their dwellings than renter households (ABS, 2012a).

2.2 Causes of energy poverty

Falling into the energy poverty spectrum is the product of three main factors: the household income, the energy efficiency of the home, and the cost of energy (Boardman, 1991, 2012; Wright, 2004). Additionally, and more recently, a much wider set of factors have been introduced into the debate, including, but not limited to "cultural norms, the dynamic and evolving nature of household needs and circumstances; and underlying socio-technical, spatial

and political issues that shape housing efficiency and energy prices" (Simcock et al., 2018, p. 2). Therefore, in this section, a review of the main triad of drivers will be followed by an account of other important factors that contribute to energy poverty and have been researched in the last decade.

2.2.1 Low incomes

In a Belgium study, Baudaux et al. (2019) used the concept of "social trajectories" to consider both the economic factors related to debts and low income, and the financial difficulties due to life accidents and misfortunes (divorces, domestic violence, disabilities, etc.) of households to explore how limited income contributes to energy poverty. In their findings, they realised living in energy poverty usually involves extra and costly expenses related to late bill payments and use of inefficient domestic appliances (also identified in Liu et al., 2017).

Undoubtedly, low income is the major driver of energy poverty (Boardman, 1991; Moore, 2012), and it has this "social gradient", as the lower the income the more likely the household is to be energy vulnerable (Bouzarovski et al., 2014; Marmot Review Team, 2011; Simcock et al., 2018). As mentioned in Chapter 1 (see page 7), the study conducted by Cornwell et al. (2016) found that low-income Australian households spent over 10% of their income on utility bills and fuel each week – four times the proportion of high income households. Nelson et al.'s (2019) analysis of the main drivers of energy poverty in Australia reiterates that low-income households (often reliant upon government income support) are the most vulnerable.

It is important to understand the different magnitudes of deprivation in relation to energy poverty that underpin the "low income – high energy costs" factors (Berthoud et al., 2004; Hills, 2012). Burlinson et al. (2018) presented three aggravating dimensions of households who suffer from energy poverty due to low incomes utilising the key economic variables of household income, housing costs, and energy costs:

1. There are those who are already below the poverty line before considering housing costs and energy costs – the traditional income-poor (IP);
2. There are those who fall into poverty after housing costs – the housing-cost-induced-poor (HIP); and
3. There are the fuel-cost-induced-poor (FIP) or, as defined by Legendre and Ricci (2015), the fuel vulnerable, as they are not ordinarily poor when considering the

income net of housing costs but turn poor because of their domestic energy expenses.

These three dimensions inform the notion that energy poverty "is a distinct problem from general poverty, but, for some households, poverty is exacerbated by fuel costs (IP and HIP), and for other households, fuel costs may indeed push them into poverty (FIP)" (Burlinson et al., 2018, p. 137).

This is the case for many older Australians who rely primarily or solely on the government Age Pension (Per Capita, 2016; The Australian Government the Treasury, 2020): the Age Pension amount is already in the low-income range, and their disposable income is very dependent on their housing and energy costs (Morris, 2016; NCOSS, 2017). Hence, older private renters dependent on the Age Pension for their income would be particularly vulnerable (ACOSS, 2018; Morris et al., 2021). While homeowners (without a mortgage) spend on average 3% of their income on housing costs, households with low income in the private rental market are more likely to be in housing stress, spending on average 32% of income on housing costs (ABS, 2019c). In 2017–18, nearly half (47.8%) of low-income households in greater capital city areas were considered to be in rental stress (AIHW, 2021b). Besides the higher housing costs and the lower disposable income, low-income private renters also typically have little or no agency over the energy efficiency of their homes, can only afford properties in the lower range of the rental market (typically poorly maintained and not energy efficient dwellings) and face the split incentive issue, as it will be explained in the following section (Horne et al., 2016; Kuholski et al., 2010; Liu et al., 2019).

2.2.2 Poor housing performance

Many building characteristics can impact on the amount of energy required to provide thermal comfort. These include age, size, typology, maintenance frequency, the building envelope and insulation, heating and cooling systems (Rajagopalan et al., 2018). In combination, these have an impact on a households' energy expenses and likelihood of being in energy poverty (Acil Allen Consulting, 2017; Allouhi et al., 2015; Grey et al., 2017). As noted, there is a strong preference to age in place in Australia (Judd et al., 2014), and, as a consequence, many older Australians are living in homes that are not energy efficient (Romanach et al., 2017).

Furthermore, building energy efficiency requirements vary for different climate zones. Cities that experience more extreme temperatures, such as Canberra (in a cool temperate zone), demand more insulation for winter and summer than cities like Brisbane, located in a warm humid summer with very mild winter zone. Table 2.3 illustrates the required artificial energy load (for both heating and cooling) and associated costs per star rating per major city in Australia. The energy cost difference from a 2-star home to a 10-star home can be up to AU$40 per m^2 per year. The average floor size of an Australian home is 186.3m^2 (Commonwealth Research, 2018), which results in associated energy costs varying by as much as AU$7,500 per year between poor energy efficient and highly energy efficient homes.

Table 2.3 - Artificial energy load and costs per star rating

Location	Climate Zone	0.5 ☆			2 ☆			6 ☆			10 ☆		
		MJ/m2.annum	KWh/m2. annum	Electricity costs in AU$ per m2.annum	MJ/m2.annum	KWh/m2. annum	Electricity costs in AU$ per m2.annum	MJ/m2.annum	KWh/m2. annum	Electricity costs in AU$ per m2.annum	MJ/m2.annum	KWh/m2. annum	Electricity costs in AU$ per m2.annum
Adelaide	16	584	162.22	$61.03	325	90.28	$33.96	96	26.67	$10.03	3	0.83	$0.31
Brisbane	10	245	68.06	$16.02	139	38.61	$9.09	43	11.94	$2.81	10	2.78	$0.65
Canberra	24	957	265.83	$73.26	547	151.94	$41.88	165	45.83	$12.63	2	0.56	$0.15
Melbourne	21	676	187.78	$43.70	384	106.67	$24.82	114	31.67	$7.37	2	0.56	$0.13
Sydney	17	286	79.44	$21.89	148	41.11	$11.33	39	10.83	$2.99	6	1.67	$0.46

(Source: The author with information from NatHERS National Administrator (2012) and Canstar Blue (2019))

As discussed in Chapter 1, the poor energy efficiency of homes is potentially a serious financial and health issue, more especially for older people reliant on the Age Pension for their income. Low-income households find it difficult to sustain a good level of maintenance, as they usually do not have the financial resources to improve home energy efficiency (Baudaux et al., 2019; Chester, 2013) or they live in rented accommodation, and it is outside their control (Daniel et al., 2020). Low levels of building maintenance accelerate the natural process of weathering and wear, and problems of leaking roofs, damp walls, mould, plumbing issues, or timber rot in window frames. This deterioration changes the energy use pattern of households for heating, cooling and water heating, which represent a significant proportion (between 50% and 60%) of the average Australian household energy consumption (DIS, 2015; Sustainability Victoria, 2014).

The type of dwelling, usually associated with age of construction, size of the dwelling and existing energy efficient features, also affects the propensity for energy poverty. While Kearns et al. (2019) and Poruschi and Ambrey (2018) found that people living in higher-density dwellings were more likely to enter energy poverty than those living in other types of flats or houses, this is not the usual pattern. Living in freestanding houses is associated with greater energy use, as these are usually larger (ABS, 2012a). A report from an inner-city Local Government Area in Sydney confirms that detached houses produce more greenhouse gas, and carbon reduction initiatives should focus on the older stock (Kinesis, 2019).

Finally, tenure type affects energy efficiency measures in buildings (Liu et al., 2019). As argued by Anagnostopoulos et al. (2016), owner-occupied buildings are the most appropriate for retrofit programmes reducing energy poverty because they do not have the issue of "split incentives". Split incentives refer to the common rental situation where the person paying for renovations and energy efficiency upgrades (the landlord or building owner) is not the one receiving the benefits (the tenant). In these circumstances, the landlord may not be so inclined to make the necessary upgrades to the dwelling, or renters may fear their rent will go up because of those upgrades. Horne et al. (2016) add that, in the Australian private rental market, landlords generally overestimate the likely thermal performance of their rental properties and/or have little or zero knowledge about existing retrofit assistance schemes.

It is noteworthy that low-income Australian households are more likely to rent (ABS, 2017; Productivity Commission, 2019), and many can only afford to rent homes in the lower range of the market, where dwellings are usually of poor energy efficiency (ACOSS, 2019a; Liu et al., 2019). In 2016, of occupied private dwellings in Australia, 31% were owned outright, 34.5% were owned with a mortgage and 30.9% were rented – with private rented dwellings accounting for around 27% and social housing[15] for around 4% (ABS, 2017). The private rental sector is expected to continue growing over the coming decades (Morris et al., 2021; Pawson et al., 2017), and the split incentive issue needs to be addressed with stronger regulations with respect to energy efficiency of rented dwellings (MacAskill et al., 2021; Wood et al., 2012). Community organisations and housing providers have also urged that the development,

[15] in Australia, social housing is constituted by public housing owned and managed by State governments and community housing managed by not-for-profit organisations registered and regulated by the State government (NGOs, church-linked institutions, etc.).

financing and implementation of programs be put in place to improve the energy efficiency of all existing and new social housing (ACOSS, 2019a).

2.2.3 High energy prices

Increases in domestic energy prices are due to many complementary factors. The transformation of the energy sector through privatisation, liberalisation and opening of energy markets for competition with poor regulation have played a pivotal role in increasing energy prices in the past decades globally – including Australia (Anagnostopoulos et al., 2016; Chester, 2015; Chester & Morris, 2011).

Wider trends in global and regional commodity markets have influenced energy prices in many countries (Anagnostopoulos et al., 2016; Okushima, 2017). Carbon taxes (also known as pollution taxes), for instance, try to address the negative externalities of greenhouse gas emissions from energy sources and aim to promote a transition to more efficient and sustainable energy sources (Carbon Tax Center, 2018; Parliament of Australia, 2010). However, the impact of these taxes on energy prices are passed onto household customers in the form of higher tariffs. In the Australian context, a carbon tax, which came into effect on July 2012 (and abolished in 2014), was set at AU$24.15 per tonne of carbon dioxide equivalent (CO_2-e) emitted (Robson, 2014).

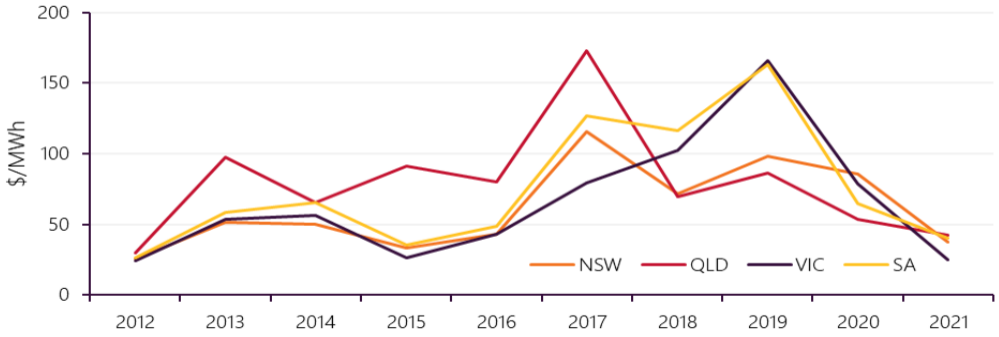
In Australia, the average increase in household electricity prices from 2007 to 2013 was nearly 83%, way above inflation which during this period was 17.75% (Alioth Finance, 2021; Azpitarte et al., 2015; Chester, 2013). Recent data indicates that wholesale electricity prices rose across Australia's National Electricity Market (NEM) by 153% in NSW and 263% in VIC between 2015 and 2019 (AEMO, 2019). Nevertheless, since the onset of the COVID-19 pandemic and the increasing uptake of rooftop PV in Australia, overall electricity demand (including commercial, industrial and residential uses), and wholesale prices have fallen slightly (AEMO, 2020a; Jemena, 2020; Krarti & Aldubyan, 2021).

In 2021, the first AEMO[16] Quarterly Energy Dynamics report (2021b) showed that, due to milder summer conditions and reduced cooling requirements (compared to 2020's Black Summer - see ANU, 2021; Davey & Sarre, 2020 for more details), NEM wholesale electricity prices have fallen by up to 68%, reaching the lowest Q1 averages since 2012, as seen in Figure

[16] Australian Energy Market Operator

2.1. It is noteworthy, however, that the change in wholesale energy prices are not always followed by proportional changes in residential energy retailers' market offers, since the latter add environmental, regulated network and residual costs into the wholesale purchase costs (AEMC, 2020).

Figure 2.1 - Wholesale electricity prices in Australia



(Source: AEMO, 2021)

Despite the current trend with respect to the reduction of wholesale energy prices, rising energy costs associated with higher temperatures and more extreme weather events (Australian Academy of Science, 2021; Borchers Arriagada et al., 2020) are likely to once again increase household energy expenditure, putting pressure on household finances and widening the problem of energy poverty (KPMG, 2017; Ormandy & Ezratty, 2012; Saman et al., 2013; Walker & Day, 2012). On account of that, Nicholls et al. (2017a) see households' vulnerability to extreme heat also as an electricity policy issue, as changes in peak electricity prices during extreme hot weather are likely to encourage demand responses which could be detrimental to the health of vulnerable groups such as older low-income households who are already conservative with energy use.

2.2.4 Distinct household energy needs and the occupant behaviour

In general, energy vulnerable households have limited agency to reduce or overcome their own vulnerability (Middlemiss et al., 2019; Robinson et al., 2018b). Studies have identified which population groups are more prone to energy poverty. As discussed, low-income households are unquestionably more vulnerable to the effects of increased energy costs (Bouzarovski, 2014; Chaton & Lacroix, 2018; Papada & Kaliampakos, 2018). Besides their limited financial resource, their energy poverty is compounded by the fact that they usually live in poorer quality houses with low energy efficiency features (Liu et al., 2019). In terms of household types, single parent families (especially those headed by women), large families

with children and older households in Australia also fall into energy poverty more frequently than other household structures (Judson et al., 2019; Nelson et al., 2019).

Adding to the triad of main factors, a UK study conducted by Kearns et al. (2019) see occupant behaviour, including the use of the home, energy practices and personal comfort, household structure and dynamics, as a fourth driver of energy poverty, as it directly influences energy behaviour (as studied by Hernández, 2016) and attitudes towards energy efficiency measures. Some of the occupant behaviour characteristics highlight the energy literacy (Hogan et al., 2019; Martins et al., 2020) component, which is still poorly defined and understood in the context of energy poverty (Brounen et al., 2013; Judson et al., 2019; Nicholls et al., 2017a). There is a need for further research on what is energy literacy; what is important for energy poor households to know in terms of energy-related subjects, and how this knowledge can help them escape or empower them to alleviate their situation of energy poverty.

The distinct energy needs and practices of different households types, lifestyles and age groups also affect how energy poverty is experienced (Azpitarte et al., 2016; Legendre & Ricci, 2015). The majority of the research on this topic addresses occupant behaviour when considering its influence on the effectiveness of energy efficient interventions (Johnson et al., 2013; Willand et al., 2019), the commonly undesired rebound effects (Hamza & Gilroy, 2011; Sustainability Victoria, 2016; Tweed, 2013) or the usual coping mechanisms of energy poor households (Anderson et al., 2012; McKague et al., 2016). Few studies, particularly among households with special needs and disabilities (de Chavez, 2018; Snell et al., 2015), have investigated the different energy needs of households in energy poverty.

There is consensus that households with a member with a disability or long-term health condition (including mental health issues) are more vulnerable to energy poverty (Azpitarte et al., 2015; Kearns et al., 2019). Chavez (2018. p. 182) indicated there is a "triple-hit effect" of disability and energy poverty, as disability and ill-health can potentially "send people into a spiral of worsening energy poverty", and energy poverty itself can aggravate illness and disability conditions, lowering income and/or further increasing energy needs. Needless to say, older low-income households are more likely to live with some sort of disability or

impairment[17] and experience greater social exclusion than other household types (AIHW, 2020b; Cotterell et al., 2018).

2.2.5 Local identity, cultural norms, and ethnicity

Local identity and cultural norms play an important role in energy practices and coping mechanisms for energy poverty. Hitchings et al. (2015, p. 162) in their study of winter heating practices in a typical beach-side city in NSW (with comparatively mild winter temperatures) found that households "would downplay the discomforts of winter cold because the cultural focus there was squarely on summer". Denying and ignoring the winter season influenced how they chose to engage with cold weather adaptation and, therefore, endure thermal discomfort. For Australia, a country that—despite reaching very low temperatures in winter in many localities—is frequently associated with summer lifestyle and very high temperatures, this is particularly relevant and partially explains the prevailing lack of more stringent building energy efficiency regulations (Berry & Marker, 2015).

In the US, race and ethnicity are also closely linked to the experience of energy poverty. Hernández et al. (2016) found that African Americans across the economic spectrum experienced energy poverty at higher rates than other groupings. In Germany, immigrants who experienced language barriers and a lack of knowledge of the government welfare system and the energy system were more likely to suffer severe energy poverty (Grossmann & Kahlheber, 2018). It is likely that language barriers and lack of knowledge of the welfare system are also issues in Australia. Australia is a major immigrant receiving country, and the latest Census indicated that 26% of the Australian population were born overseas (ABS, 2017).

Although research on Indigenous communities and energy poverty in Australia is limited, the available studies indicate substantial energy-related disadvantage (Energy Consumers Australia, 2019; St Vincent de Paul Society & Alviss Consulting, 2016). Poorer health, and lower levels of education and employment result in lower earnings compared to non-Indigenous households (AIHW, 2021a), which affect energy affordability. A study conducted by Bedggood et al. (2017) on 867 Aboriginal households in Victoria from 2013-2015 revealed that most homes were rented, old and of poor energy efficiency, with inadequate domestic appliances. Moreover, Indigenous households tend to be larger than other

[17] The prevalence of disability increases with age and more than doubles between the ages of 65 and 85+ (ABS, 2019b). Moreover, 50% of people aged 65 years and over have some kind of disability.

households, with a higher number of dependent children (ABS, 2016a). Living in more remote areas also contributes to issues of accessibility and affordability, as electricity is more expensive to generate and distribute (Markham et al., 2020). Drawing on smart energy meter data of 3,300 Indigenous households with prepaid electricity services in the Northern Territory, Longden et al. (2021) found that 91% experienced a disconnection from electricity due to lack of credit during the 2018–2019 financial year, and 74% were disconnected more than ten times in a 12-month period. In addition, many remote Indigenous communities are distant from transmission infrastructure and have to rely on diesel generators, as renewable decentralised energy in these regions is not widespread (Riley, 2021).

2.2.6 Older age and gender-related issues

Older Australians (aged 65 and over) who rely primarily, or solely, on the government Age Pension[18] are particularly vulnerable to energy poverty. As mentioned, Azpitarte et al. (2015) estimated that more than one-third of households identified as energy-poor had a reference person aged 65 years or above. A similar UK study estimated nearly a quarter of energy-poor households had a resident who is over 60 (Department of Energy and Climate Change, 2015). Noteworthy is that within the older cohort there is a significant gender factor with respect to energy poverty. Although it is often presented as gender neutral in the developed countries (research on energy poverty in developing countries fully acknowledge the gender disparity – see Moniruzzaman & Day, 2020 and Pachauri & Rao, 2013 for a richer discussion), its impact is uneven (O'Neill et al., 2006). The gender disparity has recently drawn more attention from researchers (Clancy et al., 2017; Robinson, 2019). Petrova and Simcock (2019) revealed in their study that everyday strategies adopted by energy poor households often took on a gendered nature and the "emotional labour" of living with it was much heavier on women. As Bouzarovski et al. (2021, p. 4) reiterate: "gender, therefore, is not only a driver of energy poverty, but also a key element of energy injustices as they relate to everyday life". In Australia, like many other advanced economies, older women are more likely to experience entrenched poverty than older men and be subject to energy poverty as a result (Robinson, 2019; Wilkins et al., 2020).

[18] Government Age Pensions are means tested. In February 2021, the full government Age Pension was $472 a week for older people living alone and $711.80 a week for couples. The minimum wage at this time was $753.80 a week.

2.3 The impacts of energy poverty

In developed countries the consequences of energy poverty are usually studied from the perspective of the household, who report high levels of financial stress and material deprivation—including food insecurity—, poor physical and mental health, poor wellbeing, and social exclusion (Llorca et al., 2020; Thomson et al., 2017; Tuttle & Beatty, 2017). There is usually a compound effect associated with these impacts, as detailed below, and no specific hierarchy is implied in this thesis. In summary, energy poverty begets more poverty. Qualitative research on the lived experience of energy poor households examines these impacts in detail (Baudaux et al., 2019; Chard & Walker, 2016; Longhurst & Hargreaves, 2019; Willand et al., 2017; Willand & Horne, 2018).

2.3.1 Financial stress, food insecurity and cutting of consumption

The primary energy poverty impact is economic, as household finances are affected. When on a low income, money spent on energy bills cannot be spent elsewhere (Howden-Chapman et al., 2007). The lack of disposable income can precipitate other problems, such as food insecurity (ACOSS, 2019b; Liddell & Morris, 2010; Morris, 2016; Simcock et al., 2020). The prevailing definition of food security agreed to at the World Food Summit in 1996, refers to

> *A situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritional food that meets their dietary needs and food preferences for an active and health life* (in Barrett, 2010, p. 825).

There is increasing evidence that in advanced economies money spent on energy bills is contributing to food insecurity (Kearns et al., 2019; Hernández, 2016). In their analysis of how rises in the price of electricity, natural gas and gasoline affected households' survey indicators of food distress or food access in the US, Tuttle and Beatty (2017, p. 2) concluded that "households adjust the quantity and quality of foods they eat in response to unexpected increases in energy prices". In another US study, Cook et al. (2008) interviewed caregivers in emergency departments and primary care clinics to understand the effect of energy poverty on their children's health. They found that, of nearly 10,000 children, 34% experienced energy poverty to some extent and these energy-poor children were more prone to the "heat or eat" dilemma, hospitalisations, and poorer health ratings and education outcomes than children not in energy poverty. The same effect is identified in low-income

older population groups in the US during winter and summer (Nord & Kantor, 2006) and UK (O'Neill et al., 2006).

Besides food insecurity, the high energy costs can also result in an inability to purchase other essentials. Spending a high proportion of income on energy may reduce a household's capacity to purchase goods and services related to health, comfort and wellbeing, such as prescriptions, clothing and personal hygiene items, transport (and spatial mobility), entertainment and leisure (Bednar & Reames, 2020; Gronlund et al., 2016; Hernández & Siegel, 2019; Liddell & Morris, 2010; Morris, 2016).

As noted, people on the Age Pension dependent on the private rental sector invariably have much higher housing costs and lower disposable income than their counterparts who are home owners or social housing tenants (Daniel et al., 2020; Liu et al., 2019; Wright, 2004). Furthermore, Munyanyi et al. (2021), drawing on the HILDA data, found that being energy poor lowers a household's likelihood of homeownership and transitioning from renting to owning a home, and, although unusual, it increases the likelihood of transitioning from homeownership to renting. Their study suggested that high energy costs and lower incomes invariably reduce the capacity of private renters to save and secure a home deposit and mortgage. More studies are needed to confirm this.

2.3.2 The health impacts of energy poverty

A comparative study conducted by Thomson et al. (2017) found that in most European countries the energy-poor population is statistically more likely to report poorer physical and mental health than the non-energy poor population. In Australia, Churchill et al. (2020) found, using 13 waves of the HILDA survey, that being in energy poverty lowers households' subjective wellbeing. Still, in their opinion, further research is needed to examine in detail the nuances of the relationship between the two, and the potential mediators of that relationship.

To avoid the burden of high energy bills, many households change their energy use behaviour and patterns at home (Hernández & Siegel, 2019; Judson et al., 2019; Roberts & Henwood, 2019). When coping with energy poverty requires reducing energy consumption unsafely, many households face physical health risks (Anagnostopoulos et al., 2016; Rudge & Gilchrist, 2005). To reduce their energy bills and avoid "billing anxiety" (see Cooper et al., 2016), older Australians take extreme measures. They may avoid using heating, air conditioning and cooking appliances to reduce consumption (EWON 2018a), use only one

room, have shorter showers or shower infrequently, watch less television, use secondary devices (i.e., portable convection heater, fans or air conditioners) other than central systems for heating or cooling, go to bed fully clothed (or early) to avoid the use of heating, and rarely entertain friends or extended family at home due to the room temperature being uncomfortable (Chard & Walker, 2016; Chester, 2013; Cooper et al., 2016; Etrog Consulting and Connection Research, 2015).

Living in poor indoor environmental conditions due to energy poverty is a health risk which can precipitate or accentuate cardiovascular and respiratory problems (van Hoof et al., 2017; Wright, 2004). At low temperatures (below 12^{o}C), cold extremities and lower core temperature can induce short-term increases in blood pressure and increase cardiovascular strain, which can contribute to heart attacks and strokes in the older population (Collins, 1986). If considering the use of kerosene, biomass and coal for cooking or heating, the WHO (2018a) indicated that the resultant household indoor air pollution can also cause strokes, ischaemic heart disease, chronic obstructive pulmonary disease (COPD) and lung cancer.

It is evident that energy poverty has a range of potentially dangerous impacts on older people, especially if they have existing health issues. Research with 3,353 older adults in the United States, Canada, and France found that winter months and colder temperatures appear to worsen symptoms of dementia and reduce cognitive ability (thinking and concentration) in older adults (Lim et al., 2018). Other studies have found significant association between cognition impairment, unstable gait, and risk of falls, which explains a high prevalence of falls in older adults with dementia (Taylor et al., 2014; Zhang et al., 2019).

Aschkenasy and Rothenhaus (2006, pp. 414–415) describe the effects of ageing in cardiovascular health: “[c]ardiac functional reserve is diminished with age, [resulting in] lower cardiac output, decreased cardiac reserve, and [limited ability] to tolerate hemodynamic stress”. Adding to that, older people have a lower basal metabolic rate (due to steady decrease in muscle mass) and a decreased thermoregulatory response, which can result in problems to maintain core body temperature when indoor temperature drops (van Hoof et al., 2017). Besides the established relationship between excess winter deaths (EWD) and low indoor temperature during cold weather, heatwaves and an inability to cool the home adequately have become a major health risk (Thomson et al., 2019; Vicedo-Cabrera et al., 2021).

Corroborating the argument presented in section 1.4 with respect to the compounding effects of energy poverty and climate change contributing to greater morbidity and mortality

among older Australians, Hanigan et al. (2021) conducted a quantitative analysis of summer and winter cause-specific deaths of Australians aged 55 and over between 1968 and 2018. Although winter mortality is still higher than summer mortality, their study concluded that the warming climate over 50 years was associated with an increase in the ratio of summer to winter deaths. This finding leads to concerning implications for healthcare systems, emergency services, housing, energy supplies and disaster preparedness in case climate change impacts increase, with deaths in the hottest months potentially dominating the burden of mortality among older Australians.

In summary, physical fragility increases with age, which can then reduce people's ability to keep cool or warm and maintain their health in extreme temperature events (Steffen et al., 2014). In recent decades, Australia's wildfires and heatwaves were responsible for over 60% of all deaths related to natural hazards (Borchers Arriagada et al., 2020). There is little doubt that climate change will intensify the challenges faced by many older people, especially if frail and low income. They are likely to not have the financial resources to ensure that their homes are at a comfortable temperature.

2.3.3 Energy poverty, social isolation and impacts on everyday life

Social isolation is another possible outcome of energy poverty, as households avoid having people visit because it is thermally uncomfortable or they fear higher energy use (Kearns et al., 2019; Middlemiss et al., 2019). Furthermore, if energy expenditure constitutes a substantial proportion of disposable income, it makes it difficult for people to partake in social activities (Chester, 2013; COTA, 2018). They would rather spend the money that is required to engage socially, on food purchases, prescribed medication and their energy bill (Morris, 2016; O'Neill et al., 2006).

Lastly, considering all the impacts highlighted above and the fact that energy is used for virtually every household activity, from internet access to having a shower or boiling water for tea, it is important to question what does the self-restriction imposed by energy poor households prevent them for achieving in their everyday life and how does this affect their general wellbeing and capacity to live a pleasant life. In this sense, the intersection between energy poverty research and the capabilities framework, as it will be further detailed in Chapter 3, offers a useful perspective.

2.4 Fighting energy poverty

As studies indicate, there is no single solution or "one-size-fits-all" approach to tackling energy poverty (Boardman, 2010; Che et al., 2021; Daniel et al., 2020). It needs to be addressed at many levels – from nationwide policy frameworks to institutional assistance and local household interventions. As Primc and Slabe-Erker (2020, p. 32) suggest, recognising energy poverty "as a social- or energy-related issue is a key determinant of the type of policy measures that are put in place". In their view, social policies that assist the most vulnerable consumers through the welfare system need to be combined with energy policies towards market legislation, grants and tax reductions for energy efficiency improvements, if social, environmental and health benefits are to be attained.

Once the energy poverty issue is acknowledged and defined in the political agenda, legislations and incentives can provide a basis for putting in place financial assistance, additional protection for consumers in retail markets, energy efficiency programmes targeting the building stock and/or appliances, and raising awareness regarding consumer rights and information on energy saving measures (Anagnostopoulos et al., 2016). Some of these strategies can be considered short-term (Kyprianou et al., 2019), and others medium to long-term strategies, as they deal with the main drivers of energy poverty, such as poor energy efficiency, but do require a significant time-frame for deployment and expected results.

Short term solutions, usually financial aids, are based on providing immediate relief for those experiencing hardship. In NSW, for example, subsidies, such as the EAPA (Energy Accounts Payment Assistance) $50.00 vouchers distributed by the NSW Government (2018a), and rebates from government to eligible customers[19] aim to alleviate the burden of already unaffordable energy bills or reducing energy costs without intervening at the energy consumption level. Additionally, by law, hardship programs or billing arrangements with energy providers (Australian Government | Department of Human Services, 2019; State of New South Wales and Department of Planning and Environment, 2018) must be offered to customers if need be.

Medium term solutions, with respect to soft and/or small-scale interventions, can either focus on offering advice in changing energy use patterns and behaviours to reduce costs

[19] Low-income households, concession card holders, people with life support equipment required at home and those unable to self-regulate body temperature when exposed to extremes of environmental temperatures.

or increase awareness to the public, or subsidise low-cost energy-efficiency measures for vulnerable consumers. An example of the combined effort is reported by Cooper et al. (2016), in which social marketing programs and community training were complemented with energy efficient retrofits. Discounts offered by the NSW government on appliance replacements, energy efficient lighting and air conditioning (2018b) also aim at reducing energy costs by reducing energy consumption, but only up to a certain level, as they would be considered "low-hanging-fruit" interventions.

Long-term solutions would involve comprehensive policies to improve the overall energy performance of the existing housing stock through subsidies, incentives, tax benefits and stronger legislations. The Renovation Wave program in Europe (European Comission, 2020) is a good example, aiming to double the annual energy renovation rates in the next 10 years (from 2020 to 2030) while prioritising tackling energy poverty and worst performing buildings. As seen previously (Chard & Walker, 2016; Goldstein et al., 2020), energy poor households tend to mostly live "low-carbon lifestyles" due to limiting energy consumption at home. Energy efficient retrofits will not only improve thermal comfort and health while reducing energy costs, but also enable more capabilities to be achieved by households, if they have access to more efficient energy services.

Energy efficient retrofits vary with respect to scope and potential benefits. Willand et al. (2012) and Xing et al. (2011) summarise the common energy efficiency improvements in order of prioritisation from: increasing the energy efficiency of the building envelope (through insulation, window exchange and draught proofing), installing energy efficient operational appliances (i.e., heating and cooling systems, in particular) to finally installing on-site low carbon and renewable energy systems (solar PV cells and solar hot water system) with smart grid connections and control. Previous studies in Australia and New Zealand indicate that insulation only retrofits are associated with increases in temperatures in living and bedroom spaces during winter (from 0.5^{o}C to 2^{o}C), decreased relative humidity (-2.3%) and up to a 19% reduction in energy consumption (Cooper et al., 2016; Howden-Chapman et al., 2007; Willand et al., 2019).

In previous years, the Low Income Energy Efficiency Program (LIEEP) was one of the measures announced in July 2011 as part of the Australian Government's climate change

strategy[20] (DEE, 2016). The program provided grants to consortia of government, business and community organisations to trial approaches to improve the energy efficiency of low-income households and enable them to better manage their energy use (Russell-Bennett et al., 2017). Twenty recipients (a total of 44 initiatives) were successful in securing grants worth a total of AU$55.3 million (DEE, 2016). The initiatives were targeted to distinct cohorts of residents in Australia, including the aged, disabled, young adults, new parents, those on social benefits, Aboriginal people, and culturally and linguistically diverse (CALD) people (Russell-Bennett et al., 2017). At the present moment, despite the need to decarbonise the residential building stock (ClimateWorks Australia, 2020) to meet Paris Agreement targets (UNFCCC, 2015), there is no comprehensive plan to alleviate energy poverty through improving residential energy efficiency. Current incentives are focused on retrofitting commercial buildings (The Australian Government, 2019c).

There are also more innovative solutions that include bottom-up interventions, energy co-operatives, social impact initiatives and NGOs (Anagnostopoulos et al., 2016; Bouzarovski et al., 2021; Martiskainen et al., 2018) offering different ways to deal with energy poverty. For instance, the Australian Energy Foundation (2021), formerly known as the Moreland Energy Foundation, works closely with households, governments, businesses, and academia to accelerate the energy transition and empower vulnerable communities to overcome energy hardship. Initiatives include free advice on energy efficiency, free quotes for energy retrofits, and low-cost home energy assessments. The foundation also designs strategies and action plans for governments wanting to reduce carbon emissions.

Likewise, considering the current context of energy transition, decentralisation and digitalisation, smart technologies such as blockchain, Internet of Things and Distributed Ledger Technologies (DLT) can perhaps enable diverse mechanisms in the future, such as peer-to-peer energy trading and donation (Aoun et al., 2021). Nonetheless, Bouzarosvki et al. (2021) and Barrett et al. (2021) insist that these innovative solutions do require careful design and assessment, as they can only be truly helpful for energy poor households if the energy poverty agenda is embedded explicitly in the energy transition and climate change agenda. If not, there

[20] Prior to LIEEP, a massive AU$2.7 billion home insulation program was implemented as part of a 2009 economic stimulus package to protect the Australian economy against the Global Financial Crisis. Unfortunately, the initiative was not properly designed and implemented, resulting in four deaths of young and untrained installers, 94 house fires related to the insulation, and allegations of fraud (Grattan, 2014).

is the possibility of continuing "the persistent and systemic dynamics of stigmatisation and exclusion that lie at the root of the energy poverty problem" (Bouzarovski et al., 2021, p. 14).

In Australia, there is still much to be done for energy poverty to be recognised as a national issue. The current government priority for "a fair deal on energy" (The Australian Government, 2019a) outlines an Energy Policy Blueprint for "delivering an affordable and reliable energy system, putting energy consumers first, [and] taking real and practical action to reduce emissions and meet international commitments". However, apart from the Energy Supplement provided to recipients of government pensions or allowances (The Australian Government, 2019b), there is still no Federal Government acknowledgement of energy poverty or hardship, and no substantial policies in place to resolve it. Instead, there is only a very passive approach into "improving market transparency and accountability, helping consumers reduce bills and navigate the energy market, and expanding powers to deal with misconduct" (The Australian Government, 2019a). Ultimately, that leaves each Australian state to develop its own programs and policies to deal with energy poverty[21].

2.5 Conclusions

The literature review has illustrated that there is still no unanimous agreement on what it means to be in energy poverty, and that it is extremely challenging to establish a common definition and methodology for measuring it (Boardman, 2012; Culver, 2017; Moore, 2012). Attempts to theorise energy poverty within broader frameworks of vulnerability (Middlemiss & Gillard, 2015), justice (Day, 2021; McCauley, 2018), capabilities (Day et al., 2016) and democracy (van Veelen & van der Horst, 2018) have expanded our understanding of the issue. However, the more complex the theorisation becomes, the more problematic it is to measure it. Ultimately, for practical reasons, tracking energy poverty at a national scale with quantifiable indicators requires a narrower point of view (Okushima, 2017; Sareen et al., 2020), i.e., simpler variables that usually measure only economic drivers and/or standard measurable outcomes.

Hence, researchers are usually in two minds about the define-measure paradox: what comes first and what to focus on? For Kyprianou et al. (2019), one cannot exist without the

[21] Although briefly commented in previous paragraphs, an overview of the recent existing energy-related concessions and rebates can also be found online in Services Australia (2021) and the recent policies and intervention strategies by state can be found in Daniel et al. (2020) and Whaley and Hamilton (2018).

other. As the section on indicators of energy poverty revealed, current measures often fail to accurately identify energy poor households, and numbers are frequently underestimated. More qualitative research on the lived experience of energy poor households may help fill this gap about how to detect the hidden aspects of energy poverty.

In Australia, the setting for this research, the scale and nature of the problem among energy poor households remains under-researched (Daniel et al., 2020). Although researchers have a general idea of who are the most energy vulnerable Australian households (ACOSS, 2018; Azpitarte et al., 2015; Chester, 2013; Nance, 2013; Willand & Horne, 2018), more evidence is needed on the diverse contributors to energy poverty and its impacts on distinct household groups, in order to provide targeted policy guidelines, support advocacy and guide intervention programs. It does not help that successive Australian governments have not acknowledged energy poverty as a major issue with potentially aggravated outcomes in the coming decades of climate change. This is despite studies showing that energy poverty in Australia is increasing as energy prices soar and incomes remain stagnant (ACOSS, 2019b; EWON NSW, 2021a; VCOSS, 2018).

Chapter 3 A Theoretical Framework for analysing Energy Poverty

Introduction

In this chapter, I map the theoretical framework used to analyse energy poverty and guide my data collection and analysis. I draw primarily on Pierre Bourdieu's theory of practice (Bourdieu, 1990b, 2005). In Section 3.1, I present a summary of his main concepts—field, capital, habitus, and symbolic violence. An understanding of these concepts is central for the following Section 3.2, where I analyse the Australian energy market through Bourdieu's lens of field, in which power imbalances occur while two main forms of capital are traded: "economic capital" and a form of capital I have developed drawing inspiration from Bourdieu – "energy capital". I argue that the concept of energy capital is extremely useful in the current context of energy transition towards (power) decentralisation of generation and distribution. Consequently, and integrating previous studies on energy poverty utilising Bourdieu's framework, I offer an original conceptualisation of energy poverty (Section 3.3) as an outcome of low energy capital, which, in turn, is strongly shaped by low levels of economic, cultural, social, and symbolic capital. At the same time, low energy capital can also impact on the acquisition of other forms of capital, highlighting the complex and multidimensional nature of the relationship between capitals and how they influence each other.

In Section 3.4, I discuss the capability approach developed by Amartya Sen (1999) and expanded on by Martha Nussbaum (2000). The capability approach is used to analyse the impacts of energy poverty on household's wellbeing. As will be shown in Chapter 8, adequate use of energy enhances people's capabilities and their capacity to lead a decent life, whereas energy poverty often has a detrimental impact. Capital and capabilities go hand in hand: the less capital (of all forms) one possesses, the less capabilities can be achieved.

3.1 Bourdieu's Theory of Practice

Bourdieu's main research interest and work was on social inequality, and how inequality gets reproduced across different social domains (Dillon, 2019). His emphasis on social practice and what people do in their everyday lives (Jenkins, 1992) inspired him to develop a

multidimensional theoretical approach to understanding social life, taking into consideration "the objective or external social forces that shape attitudes and behaviours as well as an individual's subjectivity or perception of an action in the world" (Appelrouth & Edles, 2008, p. 686).

3.1.1 The concept of field

Bourdieu defines sociology as a "social topology" (Bourdieu, 1985), which suggests the understanding of the social world through class and spatial relations and the way in which its parts are interrelated or arranged. For Bourdieu (2002) the amount and the types of capital an individual possesses within a field determines their power within the field in question. A field can take various forms (Bourdieu, 1985, pp. 723–724):

> *The social field can be described as a multi-dimensional space of positions such that every actual position can be defined in terms of a multi-dimensional system of co-ordinates whose values correspond to the values of the different pertinent variables. Thus, agents are distributed within it, in the first dimension, according to the overall volume of the capital they possess and, in the second dimension, according to the composition of their capital - i.e., according to the relative weight of the different kinds of assets within their total assets.*

Fields vary; they can represent a network, a structured system or a configured set of relationships between the varied social positions in different domains, such as, for example, the political field, the education field, the artistic field, the religious field, or the economic field (Wacquant, 1989). Different fields have their own logics of practice and of differentiation between positions. As Jenkins (1992, p. 52) highlights, fields are defined "by the stakes which are at stake", or, in simpler terms, by the type and volume of capital being valued. To exemplify, what gives someone distinction in the educational field, i.e., the qualifications and years of study, for example, are very different from the distinction valued in the economic field, i.e., the money, properties, and investments someone possesses. As Bourdieu examines the power relations and asymmetries in the diverse fields of the social world, he regards the field of power (economy and political fields) as "the dominant or preeminent field of any society [and] source of the hierarchical power relations which structure all other fields" (in Jenkins, 1992, p. 53).

Moreover, participants of a given field need to adopt certain strategies (that correspond to their positions, and the amount and types of capital possessed) to mobilise their capital, engage in the field, and preserve or improve their positions (Appelrouth & Edles, 2008; Jenkins,

1992). More importantly, active participation in that field requires practical knowledge and acceptance of its spoken and unspoken "rules and principles". In that sense, Bourdieu (1993, p. 18) constructs an analogy to what is needed to play the "social games": "the 'feel' for the game and the stakes, which implies both the inclination and the capacity to play the game, to take an interest in the game, to be taken up, [and] taken in by the game". Unequal power relations and strengths in the game mean that the powerful and dominant positions can set the game rules to sustain their advantage (Wacquant, 1989), in what Bourdieu describes as the "social reproduction" of inequality (Bourdieu, 1985). The Australian energy system and its "game rules" are contextualised within Bourdieu's idea of field in Section 3.2.

3.1.2 The concept of capital

Capital can be understood as any valuable or desirable resource—particularly because it is scarce—in relation to a particular context. As the previous section explained, individuals and groups are positioned (and classified) relative to one another in a given social field first according to the overall volume of the capital they possess and, secondly, according to the relative weight of the types of capital being valued in that field (Appelrouth & Edles, 2008). Capital awards their possessors with power in the field (Bourdieu, 1985) and is used to "show, establish, or change [one's] positioning in and among the economic-social-cultural hierarchies that comprise society" (Dillon, 2019, p. 433).

Bourdieu (2002, p. 280) defines capital as "accumulated labour (in its materialised form or its 'incorporated', embodied form)", which presupposes the existence of other types of capital than merely the well-known economic type. Although he sees economic capital as the key dimension of inequality, he also notes the importance of cultural, social and symbolic capital. What is considered a useful capital depends on the field (Bourdieu & Wacquant, 1992, p. 98):

> *A species of capital is what is efficacious in a given field, both as a weapon and as a stake of struggle, that which allows its possessors to wield a power, an influence, and thus to exist, in the field under consideration, instead of being considered a negligible quantity.*

In the field of arts, for example, economic capital is not central, but cultural capital is extremely important (Bourdieu, 1968). In private school settings, and even the corporate world, social capital—who someone knows and relates to—is of relevance (Dillon, 2019).

Lastly, as Appelrouth and Edles (2008) explain, capital is acquired and accumulated and is often exchangeable: one can use one type of capital to convert into another or gain more of another type. The clearest example is in respect to economic capital which can be used to acquire cultural capital. Capital can also be transferred or inherited. Thus an individual's class origins are often key in determining their access to capital and the quantity thereof (Bourdieu, 1984; Bourdieu & Wacquant, 1992).

Economic capital

According to Bourdieu (2002, p. 281), economic capital refers to material and tangible assets "immediately and directly convertible into money and [that] may be institutionalised in the form of property rights". It includes all kinds of material wealth, such as money savings, financial resources and investments, land and/or property ownerships, which are all important determinants of energy poverty, as seen in Chapter 2. Economic capital is the most straightforward measurable capital, as one can (more or less) calculate the overall volume of the economic capital possessed. It is "at the root of all the other types of capital" (Bourdieu, 2002, p. 288), and can be used to acquire more economic capital or other forms of capital. For example, holders of substantial economic capital send their children to elite expensive schools in the expectation that their cultural and social capital will be enhanced.

Cultural capital

Cultural capital comprises the "nonmaterial goods such as educational credentials, types of knowledge and expertise, verbal skills, and aesthetic preferences that can be converted into economic capital" (Appelrouth & Edles, 2008, p. 688). Moreover, as Bourdieu (1990a, p. 182) emphasises, "cultural capital attracts more cultural capital", meaning that it can be used to accumulate additional cultural capital, as it relates to a familiarity and pre-existing capability or cultural competence which facilitates the acquisition of new knowledge, and skills. Cultural capital is typically recognised in three forms (Bourdieu, 2002, p. 282):

> *In the embodied state, i.e., in the form of long-lasting dispositions of the mind and body; in the objectified form of cultural goods (pictures, books, dictionaries, instruments, machines, etc.), […] and in the institutionalised state, a form of objectification […] as will be seen in the case of educational qualifications.*

With respect to measuring it, there are certain challenges as it is not an easy task to itemise and evaluate the amount of cultural capital of an individual. There is a degree of

subjectivity to this evaluation that depends on a range of factors, including societal values and culture in its broader sense (Dillon, 2019). If considering its institutionalised form, one can measure academic achievements and certifications. Nevertheless, in its embodied form, how does one evaluate which knowledge, skills or aesthetic preferences are of relevance? It varies either within or across fields, just like the "rules of the game" change from field to field, as Webb et al. (2002) state: a juridical field will require a different cultural capital to an artistic field.

The educational field is obviously one in which the cultural capital is highly regarded and valued. In this field, individuals and institutions not only compete with cultural capital for power, as they also transmit, produce, and reproduce cultural capital (Dillon, 2019). Class origins play a central role in shaping the cultural capital acquired: Dillon (2019, p. 433) explains this with an illustrative example:

> *Someone from a relatively poor family can, through educational qualifications (what Bourdieu calls academic or educational capital), subsequently gain a considerable amount of capital (economic, social, and/or cultural). […] At the same time, however, there is a close positive relationship between socio-economic background and educational capital. This means that children who grow up in families of high socio-economic status – i.e., families that have relatively large amounts of economic and/or cultural capital – are more likely than children from families of low socio-economic status to go to and succeed in college (i.e., acquire educational capital) and subsequently achieve occupational-economic success.*

In Australia, family background plays a pivotal role in determining students' achievements. The most disadvantaged young Australians are less than half as likely to have or be working towards a university degree than their middle class counterparts (Lamb et al., 2020). The school's socioeconomic composition also matters, with schools with a high proportion of low-income students performing poorly relative to schools where most students come from middle or high income households (Thomsom, 2017).

In the context of energy poverty, according to Azpitarte et al. (2015), over 85% of Australian energy-poor households have only completed a diploma, certificate, Year 12 or below[22], which signals limited cultural capital. Conversely, other studies have shown that higher educational attainment, from undergraduate degree onwards, has a significant impact on employment, incomes (higher incomes and more diverse sources) and reduced reliance on

[22] About half of this percentage only completed Year 11 or below (Azpitarte et al., 2015).

the government Age Pension due to higher lifetime earnings (Department of Education, 2019; Department of Education and Training, 2016). In these instances, substantial cultural capital has translated into sizeable economic capital.

Cultural capital can certainly vary across generations (Straubhaar et al., 2012), particularly across recent generations. Globalisation, technology and digitalisation have transformed knowledge acquisition and accumulation. The issue around computer literacy in the older age cohorts, especially for low-income older households, is often a matter of cultural and economic capital (Schmidt-Hertha & Strobel-Dümer, 2014).

Social capital

Bourdieu (2002, p. 286) describes social capital as

> *[T]he aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalised relationships of mutual acquaintance and recognition – or in other words, to membership in a group – which provides each of its members with the backing of the collectivity-owned capital, a "credential" which entitles them to credit, in the various senses of the word.*

In other words, it refers to the individuals' social connections, networks, memberships, and relationships and how those are used and mobilised to facilitate opportunities to further acquire, accumulate and exchange capital (in all its forms). These social connections can take many forms and scales, i.e., a family, a neighbourhood, a workplace group or school, a religious association, a nation, etc., as long as they are directly usable and exploitable (Bourdieu, 2002). As Mulayim (2016) summarises, it is related to the benefits and advantages gained from a network of contacts, including securing or advancing social positions and sustaining existing power relations. Social capital is a key factor in the reproduction of the class structure. As Appelrouth and Edles (2008, p. 692) comment,

> *Social capital circulates within defined boundaries of social space […, it] promotes the perpetuation of class position across generations by providing access to opportunities denied to those who do not possess such resources.*

Needless to say, the social capital of disadvantaged and marginalised groups is bounded. Class location—the position in a given field—plays a key role in determining the impacts of an individual's social capital:

> *[T]he volume is contingent not just on the number of people you know but on how important the people you know are, i.e., how much economic, cultural, and social capital*

> *the people you know have and are willing to use on your behalf, and which in turn you can use to expand your volume of economic, cultural, and social capital (Dillon, 2019, p. 432).*

Thus, although low-income groups might have very strong social connections and support among themselves, which serve a very important function in community cohesion and trust, if they are not exploitable in terms of accumulating more capital or gaining influence, they are not as "valuable" as those which someone can capitalise on. This is further developed by Putnam (2000), as he differentiates bonding social capital to bridging social capital. Whereas bonding social capital happens between homogeneous groups of similar identity and background to build trust and cohesion, bridging social capital happens across heterogeneous groups, demographics and social classes (Beugelsdijk & Smulders, 2003). The nature of the relationships is distinctive, and the bridging social capital often involves shared interests, a direct pay-off, or an exchange of information, power, and better connections—in other words, capital (Pelling & High, 2005). Putnam (2000, p. 23) explains this difference and highlights the importance of the exchange relationship in bridging social capital:

> *Bonding social capital is […] good for "getting by," but bridging social capital is crucial for "getting ahead."*

Therefore, even though low-income and marginalised groups might have strong bonding social capital between themselves, they lack bridging social capital, which could potentially help them move out of their disadvantaged position.

Symbolic capital

Symbolic capital refers to a form of distinction and prestige that the "various species of capital assume when they are perceived and recognised as legitimate" (Bourdieu, 1989, p. 17). In other words, economic, cultural and social capital can be misrecognised as such and perceived as something else (a symbol) that confers distinction, prestige, reputation, honour or even charisma in the field (Appelrouth & Edles, 2008). Symbolic capital provides its possessor with power and opportunities to exercise authority and consequently improves their chances to convert it into the other forms of capital (Bourdieu, 1990a; Mulayim, 2016).

As Mulayim (2016) further explains, symbolic capital differs from the others forms of capital in the sense that it is purely subjective, therefore, difficult to be measured, transferable and similarly perceived across different fields. As it is built on reputation, prestige and fame,

"they mean nothing in themselves, but depend on people believing that someone possesses these qualities" (Webb et al., 2002, p. xvi). In Bourdieu's (1990a, p. 93) words, the bases of "reputation, opinion and representation" mean symbolic capital is unstable and can be effortlessly "destroyed by suspicion and criticism". Therefore, the value of symbolic capital, much more than the others forms of capital, is attached to its field and its individuals.

As symbolic capital is dependent on the accumulation of the other forms of capital, it is expected that the more capital one acquires in its other forms (for example, the more cultural capital in the form of educational qualifications), the more symbolic capital and power one possesses (academic titles and reputation) (Bourdieu, 1984, 1985, 1991). Some fields make it very explicit. Judges, for instance, are referred to as "Your Honour". The contrary is also true: the less overall accumulated capital, the less symbolic capital is possessed. Subsequently, it is concluded that the marginalised minorities and the unprivileged or disadvantaged groups, such as older low-income households (the focus of this thesis), have very little symbolic capital, power or influence, and are often considered a "negligible quantity" (Bourdieu & Wacquant, 1992, p. 98) subject to stigmatisation.

3.1.3 The concept of habitus

Habitus is a central concept for Bourdieu and is directly tied to the concepts of field and capital. According to Bourdieu (1977, pp. 82–83), habitus refers to "a system of lasting, transposable [across fields] dispositions which, integrating past experiences, functions at every moment as a matrix of perceptions, appreciations, and actions […]". In other words, the habitus is a "mental filter that structures an individual's perceptions, experiences, and practices such that the world takes on a taken-for-granted, common-sense appearance" (Appelrouth & Edles, 2008, p. 686).

Jenkins (1992, p. 47) clarifies that dispositions are not only attitudes, but also incorporate "a spectrum of cognitive and affective factors" that encompass ordinary classificatory categories (e.g., good or bad, essential or unimportant) and one's sense of honour. Bourdieu (1977, 1984, 1990a) also uses the word disposition to mean a particular "way of being, a tendency, propensity or inclination" that are "acquired through experience" and shaped by one's "condition of existence", thus varying "from place to place and time to time".

The "cumulative exposure to certain social conditions" produces the dispositions and tendencies that "unconsciously"—or automatically—shape one's lifestyle, everyday practices

(including the energy practices at home), and tastes (Bourdieu & Wacquant, 1992). Jenkins (1992, p. 48) explains further:

> *[T]he habitus disposes actors to do certain things, it provides a basis for the generation of practices. Practices are produced in and by the encounter between the habitus and its dispositions, on the one hand, and the constraints, demands and opportunities of the social field or market to which the habitus is appropriate or within which the actor is moving, on the other.*

The quote above emphasises the relationship between habitus and field. As an individual's habitus is acquired and developed according to their conditions of existence (including the time, place, the social class and the family background), it is considered "an internalisation of externalities" (Bourdieu, 1977, p. 72). The closer individuals are with respect to their social position and the capital possessed, the more similar their habitus, and the more they have in common, or vice-versa (Bourdieu, 1985). Thus, a person growing up in a poor, working class neighbourhood would internalise the mores and culture of their family and the neighbourhood and would usually be able to connect effortlessly with fellow residents. However, they would struggle in an upper-class environment.

Another important aspect relates to the centrality of the family and the home in the development of a person's habitus. Dillon (2019, p. 438) highlights that habitus is acquired and instilled both by explicit teaching and, more importantly, by the lived experience, particularly in the early years of childhood.

> *We acquire our cultural habitus from the repetitive, everyday habits that we experience (and enact or practice) within our family of origin, a socio-cultural context which itself is conditioned by social class and by the particular everyday habits that distinguish each social class […] [T]he tastes we have are not just cognitively learned habits, but also deeply grounded in the smells, looks, and sounds that surrounded and infused the habits in our homes and families while we were growing up.*

To illustrate this, one can compare growing up in a shantytown neighbourhood or a middle-class suburb. In a shantytown, homes are usually small, of very poor quality, and densely populated. Basic infrastructure is often poor; sanitation systems (sewage treatment), for instance, are absent, and access to electricity can be a challenge. The smells, looks, and sounds in a shantytown contrast sharply to the smells, looks and sounds in an established residential middle-class suburb of detached homes fully connected to the urban grid. In this sense, it is possible to trace an important connection between the home and the habitus,

which translates into the current research context of energy poverty and the coping mechanisms adopted for reduced energy consumption. The home is seen as an institution where the habitus is acquired. The distinct "tastes" and subjectivities around thermal comfort or what is considered an essential energy service (i.e., whether using a dishwasher or a clothes dryer is considered essential or waste), for example, is shaped by an individual's habitus.

Lastly, as the habitus shapes practices and lifestyle, but is also shaped by social and historical conditions, there is a vicious cycle that in the end tends to reproduce the existing inequalities in power relations (Webb et al., 2002). As "a structured structure that structures how one views and acts in the world" (Appelrouth & Edles, 2008, pp. 688–689), it is through habitus that one acquires a "sense of one's place", described by Bourdieu (1985, p. 728) as

> *[A] sense of what one can or cannot "permit oneself," [implying] a tacit acceptance of one's place, a sense of limits ("that's not for the likes of us," etc.), or, which amounts to the same thing, a sense of distances, to be marked and kept, respected or expected.*

What he means is that the dispositions conform to "what is objectively accessible given one's class position", i.e., a discriminatory process – commonly followed by actions of self-exclusion (Mulayim, 2016) – of "internalised estimation of what is objectively possible or impossible, reasonable or unreasonable to accomplish" (Appelrouth & Edles, 2008, p. 689). Therefore, as Swartz (1997) summarises, an individual's habitus shapes their aspirations in life according to the objective likelihoods of success or failure of those actions.

The adaptation factor and the adjustment of expectations help to explain, for example, why some energy-poor households might see as everyday conscious energy practices (e.g., not owning an air conditioner and using water spray to refresh during heatwaves) what we researchers characterise as depriving impacts and coping mechanisms in response to energy poverty. As Bourdieu (1990b, p. 54) reveals: they "make a virtue of necessity, to refuse what is anyway denied and to will the inevitable". Hence, the hidden energy poverty aspects of conforming to low expectations or denial of their own energy poor conditions can be comprehended as a matter of habitus dictated by necessity. In low-income situations, consumption habits in general are shaped by their "practical functions and economic efficiencies" (Dillon, 2019). For Bourdieu (1984, p. 373): "necessity imposes a taste for necessity which implies a form of adaptation to and consequently acceptance of the necessary" – which, again, clearly relates to households' energy practices in regards to energy poverty.

3.1.4 The concept of symbolic violence

Together with the habitus, symbolic violence helps sustain and reproduce social inequality. As Mulayin (2016, p. 52) explains, Bourdieu uses the concept of symbolic (because it is not directly physical, but just as menacing) violence to "explain how power is used in subtle ways by those who have it over those who do not", in order to maintain and reproduce the existing stratified, hierarchical and unequal relations in a given field (Appelrouth & Edles, 2008). These subtle ways – suggested by Jenkins (1992, p. 65) as "indirect, cultural mechanisms rather than direct, coercive social control", imply a collective misrecognition of reality or misinterpretation of the underlying "game rules" up to a point where "the violence is exercised upon a social agent with his or her complicity" (Bourdieu & Wacquant, 1992, p. 167).

Webb et al. (2002) explain that the dominated or disadvantaged individuals are subjected to "symbolic" forms of violence, such as being treated as inferior or being denied resources for social mobility, that they do not perceive it that way, but rather as "the natural order of things" or "just the way the world is". By accepting and taking the status quo for granted, often blaming themselves—not the system—for their personal failings, the dominated social groups legitimate the existing system of power relations, perpetuating their own domination and guaranteeing the field's structure is free from rebellion (Appelrouth & Edles, 2008). Neoliberal principles on agency provide a good example of symbolic violence:

> *The neoliberal narrative instructs that individuals exercise agency and choose whether or not to suffer poverty; obfuscating the reality that individuals become trapped in cycles of poverty (Wrenn, 2015, p. 1236).*

There is an unconscious submission, as individuals fail to recognise themselves either as victims or perpetrators of that violence (Mulayim, 2016). Another obvious example of symbolic violence and misrecognition is related to gender relations and male domination in many cultures (Bourdieu, 2001). Bourdieu also revealed how education institutions misrecognise as meritocracy an individual's aptitudes over hereditary privileges, where the beneficiaries of the system appear intrinsically worthy of their success (Appelrouth & Edles, 2008; Bourdieu, 1991). In the following sections, I explore how symbolic violence is exercised in the energy poverty context.

3.2 Analysing the energy market through Bourdieu's lens

Having summarised the main concepts of Bourdieu's theory of practice, I now turn to analysing the present Australian energy market using Bourdieu's framework. Firstly, I argue that the energy market can be understood as a field, and I use Jenkins' (1992) suggestions when using Bourdieu's concept of field:

1. Understand the relationship between the field in question and the "field of power" (politics), as the latter is the dominant source of hierarchical power relations that structure all other fields.
2. Construct a map or "social topology" of the many occupied positions and its structure in that field, in order to understand the relationships between them with respect to the field's capital (the stakes).
3. Outline the habitus of the agents within the field, along with the externalities that influence the habitus.

3.2.1 The energy field and the field of power

From government-owned energy companies until the 1990s to one of the most liberalised energy sectors in the world (Chester & Elliot, 2019), Australia has undergone major structural changes in its energy sector in the last century. Although not in the scope of this thesis to describe in detail the changes and the privatisation processes (for more information, please see Chester, 2007a, 2007b; Chester & Elliot, 2019), it is important to acknowledge the key policy elements put in place (Chester, 2015). These policy elements included the breaking-up of government monopolies into separate generation, transmission, distribution and retail companies; the creation of competitive wholesale and retail markets; new regulatory regimes to set market rules and prices for the monopoly transmission and distribution network businesses and the privatisation of government-owned companies.

Currently, there are three major Australian market bodies that oversee the energy system and report to the Energy National Cabinet Reform Committee (ENCRC) through the Energy Ministers' Meeting (The Australian Government, 2019a): the Australian Energy Market Commission (AEMC), the Australian Energy Regulator (AER) and the Australian Energy Market Operator (AEMO). The AEMC is the rule maker for Australian electricity and gas markets[23]

[23] The AEMC Commissioners are appointed by Australia's state, territory, and federal governments.

(AEMC, 2021a). Besides providing strategic and operational market development advice to governments and the Energy Ministers' Meeting, the AEMC is responsible for making and amending the National Electricity Rules, the National Gas Rules, and the National Energy Retail Rules, all of which govern the operations of the National Electricity Market (NEM), which will be described shortly.

The wholesale electricity and gas markets are regulated by the AER, including costs of transporting electricity and gas through transmission and distribution networks (which account for around 40% of a residential customer's energy bill) (AER, 2020a; Wood, 2020). However, the AER does not regulate retail energy prices, which are set by the retailers themselves[24]. Recently, when the Australian Government introduced price caps on retailers' electricity standing offers[25] in July 2019, AER was responsible for setting the default market offer[26] on standing offer prices in southeast Queensland, NSW and South Australia (AER, 2020a).

Lastly, the AEMO operates the systems that allow energy to be generated, transmitted, and distributed, and the financial markets that allow energy to be sold and bought across Australia (AEMO, 2020b). Regulated by the AER and operated by the AEMO, the NEM is made up of over 419 registered participants among energy generators, transmission network service providers, distribution network service providers, electricity retailers and (bigger) end-users, such as industry consumers (AEMO, 2020b). The NEM incorporates around 40,000km of transmission lines and cables that span across Australia's eastern and south-eastern coasts of Queensland, New South Wales (including the Australian Capital Territory), South Australia, Victoria, and Tasmania[27]. The NEM's transmission networks are monopolies owned and operated by state governments or private businesses (AEMC, 2021b; Energy Networks Australia, 2019).

The NEM is also a national wholesale electricity market in which generators sell energy and retailers buy it to on-sell to consumers. The wholesale electricity price is based on basic supply and demand—offers by generators to supply electricity to the market at particular

[24] In some states (Queensland, the ACT and Tasmania), the government can set a regulated contract (default offer).
[25] A standing offer is a type of offer all energy retailers are legally obliged to make available to customers. Minimum terms and conditions are guaranteed, and they are applied when, for whatever reason, the customer does not or cannot "choose" a market offer (Energy Consumers Australia, 2018).
[26] Nevertheless, standing offer rates remain up to 20% higher than the best market offer rates.
[27] Western Australia and the Northern Territory are not connected to the NEM, primarily due to the distance between networks (Energy Networks Australia, 2019).

volumes and prices at set times on one side, and consumer demand at any given time on the other side (AEMO, 2020b). Although there are many retail electricity and gas providers in Australia (and the trend with decentralised energy generation is that it increases), the three largest and most historic energy providers (who also generate their own energy)—AGL Energy, Origin Energy and Energy Australia—continue to dominate the retail market; in 2020 they supplied 63% of small electricity customers and 75% of small gas customers in eastern and southern Australia (AER, 2020a).

From this brief overview, it is possible to realise how the energy field is fundamentally dependent on politics (the field of power) and economic capital. Despite the privatisation of previously government-owned assets, state governments still own many transmission and distribution networks, and the state and federal governments have significant influence on AEMC, AEMO, AER and energy policies. Nevertheless, the fact that those bodies do not intervene directly on energy retail prices produces a power imbalance between energy retailers and small residential energy consumers, who have the option to choose the company supplying their electricity[28] but are more than often left confused about misleading offers (as further explored in Chapter 7), which can be argued is a form of symbolic violence. The deregulation of the energy system drastically affected energy retail prices, and introduced "new rules to the game", many of which consumers still have no knowledge of. The big three companies because of their enormous economic capital, are able to set the agenda.

3.2.2 The "social topology" of the energy field

There are five main positions in the energy market "field": the energy generators, the transmitters, the distributors, the retailers, and the end-use consumers. However, those positions relate to each other through two different forms of capital. The first and obviously prevailing capital in the field is the economic capital, as depicted in Figure 3.1. The economic capital initially flows from end-use consumers (through the payment of the energy bills) to retailers, who in turn arrange the delivery of energy to customers. The retailers purchase energy from the generators through the NEM.

As detailed in the 2020 Australian Energy Update from the Department of Industry, Science, Energy and Resources (2020), the residential sector is responsible for 10.5% of

[28] If they are not under "embedded network" schemes, where private electricity networks serve multiple premises, as in apartment blocks, with specific and common tariff schemes among all residents.

the total final energy consumption, while transport, mining and manufacturing industries accounted for over three-quarters of total energy consumption in 2018–19. While the big industry consumers have enough negotiating power to purchase energy directly from NEM, residential customers have much less bargaining power—due to smaller energy use overall—and need to purchase it from the retailers according to the market offers. Another important point is that, while participation in some fields is optional (e.g., individuals have the choice to engage with a charity organisation or not), residential households are obliged, unless they are able to live completely off-the-grid, to participate in this energy field and accept its dynamics.

Figure 3.1 - The flow of economic capital in the energy field

(Source: the author)

The energy capital in the energy field

The second relevant form of capital in this field is what I call the "Energy Capital"[29] and refers directly to the energy supply chain[30], as illustrated in Figure 3.2. The generators produce electricity, i.e., the energy capital, from varied sources – coal, gas, solar, water, wind, biomass, etc. The transmitters convert low-voltage electricity to high voltage for efficient transport over long distances to distributors. In turn, the distributors convert the high-voltage electricity to low-voltage and transport it directly to customers through their networks of poles and wires (AER, 2020a). End-use consumers utilise the energy (capital) for a diverse range of purposes, from cooking a meal to producing other goods.

Figure 3.2 - The flow of the energy capital in the energy field

(Source: the author)

[29] It would not be the first time someone suggests a new form of capital: Bourdieu has spoken about art capital (Bourdieu, 1968) and educational capital (Bourdieu & Nice, 1993), and Hakim (2010) has come up with the eccentric concept of erotic capital.

[30] To simplify, I will describe the electricity supply chain, but the gas supply chain has similar structure.

As stated by the AEMC (2021a), "energy is at the core of economic and social activity in industrialised countries". The literature review on energy poverty (Chapter 2) indicated that the lack of access to affordable and reliable energy supply and energy services are a major issue worldwide, with roots in existing socioeconomic inequalities (Walker & Day, 2012). Neoliberal economies have moved away from considering energy as an "essential service to people" to value it as an asset, a valuable resource, which one can use to capitalise, as it indeed happens in the energy field, where the energy capital is converted into economic capital and vice-versa. The more energy and economic capitals possessed, the more power and symbolic capital in the field, as observed within generators, energy retailers and big end-use consumers.

Therefore, I define energy capital as the accumulation of energy, from sources to supply and services. More specifically, and quoting Reddy's (2000) words, energy capital is the wealth of "adequate, affordable, reliable, high-quality, safe and sustainable energy services" that gives its possessors a myriad of opportunities and supports economic and human development.

In the diagrams depicted (Figures 3.1 and 3.2), it is possible to realise that the two forms of capital (energy capital and economic capital) flow from generators to end-use customers through two different networks and players. Energy retailers (except those who also generate their own energy) are not part of the energy capital flow, for example. However, considering the current energy transition to more decentralised and sustainable energy generation and distribution (Figure 3.3), there is now an overlap between energy capital and economic capital, as the functions and actions of generators, retailers and consumers overlap too.

Figure 3.3 - The overlapping flow of energy capital and economic capital in the decentralised energy market

(Source: the author)

The contemporary trend of energy consumers as producers allows them to capitalise on energy—just like the big energy producers—by selling either back to retailers, feeding in the energy grid, or other residential consumers. It is also possible, with the advancement of digitalisation and technologies, that residential small energy generators donate their energy

capital to other end-use consumers. In this sense, the concept of energy capital is extremely useful, as the energy field allows its agents to acquire energy capital, and/or produce it, and/or consume it, and/or exchange it and/or capitalise on it.

3.2.3 The economic capital and habitus of the agents in the energy field

As this research focuses on energy poverty and energy-poor households, I will focus on outlining the habitus of energy-poor households and how they are influenced by externalities in the energy field[31]. Firstly, it is important to recognise that, in the energy field, acquiring energy capital, and benefitting from it, depends on having enough economic capital. Residential consumers and their ability to benefit from energy capital vary according to their economic wealth: their income, their savings, their housing tenure, etc. To illustrate this, I can use the example of solar PV uptake. In Australia, according to the 2015–16 the Survey of Income and Housing (SIH), 22% of households in the highest wealth quintile had solar panels, compared with 3% in the lowest quintile. This difference is mainly due to the differences in economic capital. The lower levels of home ownership in low wealth households also contribute (ABS, 2019a). Home ownership and overall higher net wealth is associated with higher likelihood of installing rooftop solar (Best et al., 2019).

Considering the power imbalances between agents (particularly affecting small low-income residential consumers) described in previous sections, and bearing in mind economic capital is one of the major drivers of the macro socioeconomic inequalities, I infer that the energy field and its mechanisms of capital exchange reproduce the socioeconomic inequalities that are reflected in it (from the field of power) and extend beyond it (Bourdieu, 1985). If low-income families have no means to acquire renewable energy systems for their own energy generation, they are condemned to continue purchasing it from energy retailers. Low economic capital is directly associated with low energy capital.

Finally, I refer back to the energy practices of energy-poor households and how they are shaped by the habitus acquired in their socioeconomic setting, as commented in section 3.1.3. Different socioeconomic levels incur in different energy practices, since there is a positive correlation between income level and housing tenure, building type and size, etc. (ABS, 2017), which ultimately affects the relationship with the home. Likewise, income level also

[31] The habitus of other agents in the energy field can be studied in a future research agenda.

influences the ownership, age and frequency of use of household appliances: low-income households are less likely to own appliances such as dishwashers and clothes dryers, more likely to have older appliances, and less likely to use those appliances with greater frequency (ABS, 2012b; Frontier Economics, 2016). Therefore, the habitus and the energy practices of energy poor and non-energy poor households are often dramatically different. Furthermore, as will be discussed in the findings chapters (Chapters 5 to 8), the interview data reveal how many of the coping mechanisms of energy poverty were learned during early-childhood years. The energy practices of energy poor households date back from what their parents would teach them about energy use, highlighting the importance of the habitus (this is elaborated in Chapter 5).

3.3 A new understanding of energy poverty

3.3.1 Conceptualising energy poverty through the five forms of capital

With Bourdieu's theory in mind and the novel conceptualisation of the energy capital, I offer a new understanding of energy poverty: an issue of low energy capital, i.e., the lived experience of those with low levels of energy capital and little—if not zero—means of acquiring more of it, due to similarly low levels of economic, cultural, social, and symbolic capital. The broad conceptualisation of energy capital, and, therefore, of energy poverty, allows it to be used both for developed and developing countries' contexts of energy poverty.

The understanding of energy capital as a scarce resource dependent on the other forms of capital supports the idea that households can have varying levels of energy poverty. There will be energy poor households with just enough energy capital to get by, but who limit some "non-essential" energy practices to preserve their economic capital. There will be energy poor households in extremely vulnerable conditions who suffer high levels of energy poverty and other types of material deprivation due to them having to spend most of their economic capital on acquiring energy capital.

As the energy field, where the energy capital is more relevant, is highly dependent on the socioeconomic context and the field of power, there is a positive association, as seen previously, between economic, cultural and energy capital. In the seminal definitions of energy poverty, low incomes, poor housing conditions and housing tenure—all related to low economic capital—are main drivers of energy hardship, i.e., low energy capital. The low

cultural capital associated with low formal education, and low levels of energy literacy, also play a major role in determining the likelihood of "knowing the exact rules of the energy game", experiencing energy poverty and persisting in this vulnerable situation. As highlighted by Grossmann & Kahlheber (2018, p. 28), cultural and social competencies, attributable to their respective forms of capital, are essential to deal with "the bureaucratic regimes of billing, to deal with institutions on a level playing field, or to defend oneself against discriminatory practices".

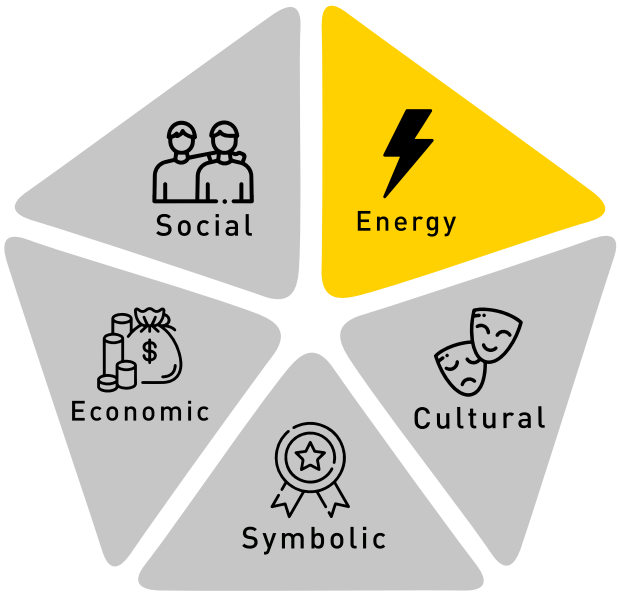
Moreover, social capital, if one considers social exclusion as an outcome of low social capital, has been shown to influence the experience of energy poverty as well. Although Reames et al.'s (2021) analysis of the nexus of energy poverty, social capital, and health in the US revealed that the health effects (from life expectancy to premature mortality) of energy poverty emerge even when controlling for some quantitative measures of social capital, other studies (Middlemiss et al., 2019) have indicated that having a strong support network and connections with the community (related to greater levels of social capital) can enable better access to energy.

On the other hand, one can analyse the countless impacts of low levels of energy capital on households' lives through its effects on the other forms of capital too. Having to use the already low economic capital accumulated to acquire energy capital (often in inefficient "transactions", either due to high energy prices, or inefficient homes and the use of inefficient appliances) means there is even less economic capital for other purposes. The other forms of material deprivation caused by energy poverty, such as food insecurity and the inability to buy other essential and non-essential items, can be understood through the lower levels of economic capital caused by energy poverty. The low level of economic capital directly influences the possibility of acquiring or maintaining social capital. Energy poor households more than often have to restrict their social activities.

Lastly, energy poverty also affects one's symbolic capital. It is evident that the prevalent socioeconomic and demographic characteristics of energy poor households – usually low-income marginalised, disadvantaged and minority groups – are coupled with limited symbolic capital in society, and, therefore, no voice or influence on the energy field. When energy-poor households have overdue bills that affect their credit history and pushes them to higher priced default offers, this further affects their symbolic capital and the recognised "credibility" from energy retailers. When energy-poor households feel ashamed or embarrassed by their

situation and/or avoid asking for help from friends and family, it could be argued that they are trying to preserve their symbolic capital. Therefore, I conclude that as a multidimensional and complex issue, the five forms of capital are intertwined in the causes and the impacts of energy poverty illustrated by the pentagon diagram in Figure 3.4.

Figure 3.4 - Conceptualisation of energy poverty through the five forms of capital



(Source: the author)

Energy poverty (low energy capital) is caused by the combination and interdependence of low economic, cultural, social, and symbolic capitals, as the same time as it further affects directly and indirectly the acquisition thereof in diverse ways. The interdependence of those five forms of capital highlights the vicious circle of energy poverty, identified in previous research (Baudaux et al., 2019; de Chavez, 2018) and expanded in subsequent chapters.

3.3.2 Integrating previous studies on energy poverty

Conceptualising energy poverty using Bourdieu's framework complements existing frameworks and offers new perspectives. The energy vulnerability (Bouzarovski et al., 2014; Middlemiss & Gillard, 2015) and the energy justice frameworks (Day, 2021; LaBelle, 2017; McCauley et al., 2013), for example, that emphasise how energy poverty is contingent on much wider social, economic, political and economic circumstances that allow distributional, procedural and recognition injustices to happen, can be seen through Bourdieu's concepts of the field's mechanisms to reproduce inequality and symbolic violence.

Other studies, such as the ones conducted by McKague et al. (2016; 2018) utilise the energy cultures framework from Stephenson et al. (2010, p. 6125) to characterise "energy consumption behaviour as the interaction between cognitive norms, material culture and energy practices". In their view (Stephenson et al., 2015), norms are the shared beliefs about how individuals behave in a given context and their expectations and aspirations in relation to, in this case, the energy consumption. Their analysis resonates with Bourdieu's concept of habitus. The material culture is defined as the households' physical assets, including the home and its domestic appliances, which would fall under the economic capital concept, and the practices refer to the actual actions of households, shaped by their habitus.

Grossmann and Kahlheber (2018) situate energy poverty within an intersectional perspective of multiple deprivations and discriminatory systems, using Crenshaw's (1991) concept of intersectionality. According to Crenshaw (1991), deprivileging social characteristics, such as being a woman, being black, being old, and being disabled overlap and intersect, producing detrimental effects. The disadvantages and discriminations arising from those marginalised characteristics reinforce each other and lead to multiple deprivations (Grossmann & Kahlheber, 2018). Through Bourdieu's theory, the multiple stigmatised social characteristics reflect the lack of symbolic, cultural and economic capital and how the powerful dominant agents in the field develop "game rules" and policies that reproduce and sustain those inequalities.

3.4 Capital and capabilities: expanding on the impacts of energy poverty

As discussed in section 3.3.1, energy poverty, as in low levels of energy capital, can impact on a households' ability to acquire and maintain other forms of capital. Low levels of all forms of capital, including energy capital, can affects one's capacity to lead a decent life, which relates to their capabilities. Therefore, to expand on the analysis of the impacts of energy poverty on households' wellbeing, I complement Bourdieu's theory of capital with Sen and Nussbaum's capabilities approach: the less capital (of all forms) one possesses, the less capabilities can be achieved.

Amartya Sen (1997) and Martha Nussbaum (2000) developed the capability perspective to analyse social inequality, wellbeing and poverty. The capabilities approach addresses the question of what does social justice, freedom and development require (Nussbaum, 2005,

2012; Sen, 1992, 1993). A key question posed is: *what are people actually able to do and to be?* (Nussbaum, 2012). Three linked concepts, functionings, capabilities and resources are used to address this question.

Functionings represent the various things that a person manages to do or be in leading a life; and the capability of a person reflects the alternative combinations of functionings he or she can achieve, and from which he or she can choose from (Sen, 1993). As Sen (1993; 1997) describes some capabilities are very elementary, such as escaping morbidity and mortality, being adequately nourished, being in good health, and/or well sheltered. Others may be more complex, but still widely valued, such as being happy, achieving self-respect, being socially integrated or, appearing in public without shame. Nussbaum (2000, pp. 70–71) developed a list of ten central capabilities (depicted in Table 3.1) as "universal values" that must be seen as a "foundation for basic political principles that should underwrite constitutional guarantees".

Table 3.1 – Nussbaum's list of central human capabilities

Central capability	Brief description
Life	Being able to live to the end of a human life of normal length; not dying prematurely, or before one's life is so reduced as to be not worth living.
Bodily health	Being able to have good health, including reproductive health; to be adequately nourished; to have adequate shelter.
Bodily integrity	Being able to move freely from place to place; and having one's bodily boundaries treated as sovereign.
Senses, imagination and thought	Being able to use the senses, to imagine, think, and reason – and to do these things in a ''truly human'' way, a way informed and cultivated by an adequate education, including, but by no means limited to, literacy and basic mathematical and scientific training. […] Being able to search for the ultimate meaning of life in one's own way. Being able to have pleasurable experiences, and to avoid non-necessary pain.
Emotions	Being able to have attachments to things and people outside ourselves; to love those who love and care for us, to grieve at their absence; in general, to love, to grieve, to experience longing, gratitude, and justified anger. Not having one's emotional development blighted by overwhelming fear and anxiety, or by traumatic events of abuse or neglect.
Practical reason	Being able to form a conception of the good and to engage in critical reflection about the planning of one's life.
Affiliation	Being able to live with and toward others, to recognize and show concern for other human beings, to engage in various forms of social interaction; […] having the social bases of self-respect and non-humiliation; being able to be treated as a dignified being whose worth is equal to that of others.
Other species	Being able to live with concern for and in relation to animals, plants, and the world of nature.
Play	Being able to laugh, to play, to enjoy recreational activities.
Control over one's environment	Political, as in being able to participate effectively in political choices that govern one's life; and material, as in being able to hold property (both land and movable goods), and having the right to seek employment on an equal basis with others.

(Source: Adapted from Nussbaum 2000, p.78-80)

The freedom to lead different types of lives and achieve different functionings is intrinsic to a person's capability set, and that will depend on a variety of factors, including a person's income, personal characteristics, social arrangements and the environment (Sen, 1993; 1997). The concept of resources, as "instrumentally valuable means to intrinsically valuable human ends" is then applied (Kelleher, 2015, p. 8). For Nussbaum (2003), individuals will inherently need different levels of resources to achieve similar levels of capability to function. Robeyns and Byskov (2021) elucidate this important distinction regarding resources and capabilities:

> *[T]he capability approach changes the focus from means (the resources people have and the public goods they can access) to ends (what they are able to do and be with those resources and goods). [R]esources and goods alone do not ensure that people are able to convert them into actual doings and beings. […] By focusing on what people are able to do and be, rather than merely on the distribution of goods and resources, the capability approach recognises the diversity of people's ability to convert those resources and goods into real opportunities and achievements - the kind of life they are effectively able to lead.*

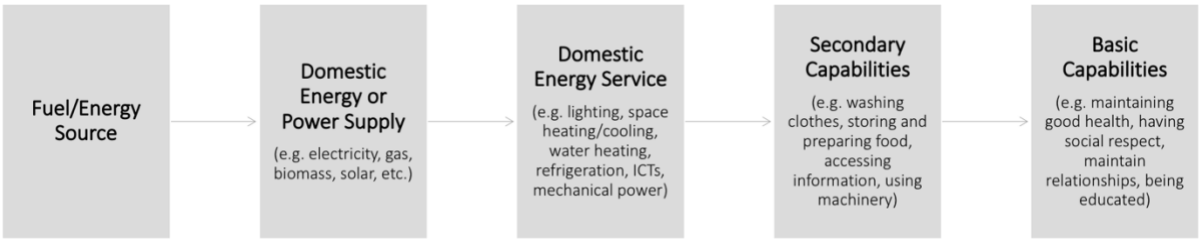
Whilst the capabilities approach places particular importance on the diverse and differing abilities of people to convert their resources into actual functioning , there is no doubt that the lack of access to different forms of resources, monetary or not, will deprive individuals from achieving certain capabilities. In this regard, I suggest that the capabilities of individuals are shaped by their habitus, social position and the amount and types of capital possessed. The amount and types of capital mentioned in previous sections are resources that potentially determine which capabilities can be acquired so that desired functionings can be achieved.

Two other important concepts in the capabilities approach refer to adaptive preferences and fertile capabilities. Adaptive preferences suggest that individuals modify their expectations and satisfactions to the level they think they can actually achieve (Nussbaum, 2012; Sen, 1992), which is analogous to Bourdieu's (1985) "sense of one's place". On the other hand, the fertile capability is one that tends to promote other related capabilities, for example education and literacy playing a fertile role in opening up other capabilities (Nussbaum, 2012). According to this definition, one can understand the resource of cultural capital as an enabler of further education that expands one's capabilities, and how the accumulation of certain forms of capital allows individuals to acquire more thereof. Likewise, economic capital is a major resource determinant for fertile capabilities: security of tenure and accommodation

costs, especially in the case of private renters, play a critical role in shaping the capability of older renters to initiate and sustain social connections, engage in leisure activities, and have a sense of control of their present and future (Morris, 2009, 2012).

As mentioned in Section 1.2, Day et al. (2016) conceptualised energy use and, therefore, energy poverty, through the capabilities' perspective. They argued that such broader understanding of the ways in which energy use is connected to socio-economic development, wellbeing and quality of life can provide a theoretically coherent means of comprehending the wider impacts of energy poverty. In their view, there are basic and secondary capabilities (Smith & Seward, 2009) within the energy use needs. Whilst a basic capability might be "being in good health", several secondary capabilities related to energy services would be needed to materialise this, including being able to keep adequately warm or cool (heating or cooling services), being able to take a shower (hot water service), and being able to acquire and cook nutritious meals (refrigeration and cooking services). All these energy services require an energy supply (and finally an energy source). Therefore, the diagram from the energy source to the basic capabilities is illustrated in Figure 3.5.

Figure 3.5 - The relationship between energy, services and capabilities.



Source: adapted from Day et al. (2016)

Energy poverty, in this sense, could be understood under the corrosive disadvantage concept (Wolff & de-Shalit, 2007), as the energy-poor restrict their energy consumption to situations of compromised secondary capabilities that largely affect basic ones (Day et al., 2016). The inability to achieve those capabilities influence individual's wellbeing and self-esteem (Baudaux et al., 2019; Longhurst & Hargreaves, 2019; VCOSS, 2017). As a result, there has been increasing agitation that universal access to a minimum level of energy services be considered a human right based on the capabilities approach (Frigo et al., 2021; Sovacool & Dworkin, 2014).

Besides analysing the impacts of energy poverty (Middlemiss et al., 2019; Willand & Horne, 2018), the capabilities approach has been applied more recently to explore other energy issues: Lee et al. (2021) and Willand et al. (2021) used the capabilities approach to evaluate current energy poverty relief policies and strategies. They found that compensation measures associated with financial assistance are ineffective in solving the problem in the long-term; empowerment measures related to increasing households' capabilities and energy efficiency measures, conversely, can create long-lasting improvement. To corroborate that, Chipango (2021, p. 447) emphasises that some basic capabilities are required for households to take full advantage of their energy services: "what matters most is not only the provision of the energy services, but the person's capabilities to promote their ends". Therefore, it is suggested that the lack of certain capabilities (which are related to economic and cultural capital mostly) can also influence the experience of energy poverty.

3.5 Conclusions

This chapter has presented the key concepts of Bourdieu's theory of practice and suggested how they can be utilised to analyse the various components of energy poverty. Drawing on Bourdieu I have developed the concept of energy capital. By conceptualising the energy market as a social field, and structuring the many agents in that field, from energy generators to end-use consumers, it is possible to establish the relevance of two types of capital—economic capital and energy capital. The accumulation of energy capital follows the inequalities within and outside the energy field, which is shaped by other forms of capital (economic, cultural, social, and symbolic). In the current context of energy transition, an individual with the necessary means, for example, with access to sufficient economic, cultural and social capital, is able to capitalise on energy. It is crucial that researchers rationalise and expose how energy injustices and wider social inequalities prevent vulnerable households from benefitting from the decentralisation of energy generation, which reproduces existing inequalities and make energy poor households even poorer in terms of energy capital.

A new understanding of energy poverty is proposed. It is presented as an issue of low energy capital, which, in turn, is determined by low levels of the other four types of capital identified by Bourdieu. I argue that this conceptual framework captures the multidimensional and complex aspects of the many drivers and effects of energy poverty while integrating the

energy field within the wider context of the field of power. To ascertain that this framework is suitable, I have shown how current frameworks and conceptualisations of energy poverty fit into Bourdieu's concepts of field, capital, habitus, and symbolic violence. As posited, this approach complements existing approaches to understanding energy poverty.

In addition I discussed how the capabilities approach (Nussbaum, 2000; Sen, 1993) complements Bourdieu's framework in regards to exploring the impacts of energy poverty on people's wellbeing and capacity to live a pleasant and decent life. Considering Day et al.'s (2016, p. 260) definition of energy poverty as an "inability to realise essential capabilities" due to insufficient access to energy services, I can link the notions of Bourdieu's forms of capital with the capabilities approach to understand energy poverty by using the concept of energy capital. Low energy capital affects one's ability to acquire and maintain other important forms of capital that consequently further impact on their capacity to realise essential capabilities, such as being in good health, escaping morbidity, engaging in leisure and social activities, or living a pleasant life. Likewise, the access to sufficient energy capital enables capabilities by itself (e.g., if someone is able to remain healthy by keeping his/her home at a comfortable temperature) and enables the acquisitions of other forms of capital (e.g., being able to use the internet at home for educational purposes) that further enhance one's capabilities.

When Bourdieu (1985) sought to understand social life through the theory of practice, he had in mind its practical outcomes and the researcher's responsibility to bring together theory and practice to encourage transformation towards a more just society (Shusterman, 2015). I have developed this framework for understanding energy poverty with the purpose of offering a broader, pragmatic conceptualisation of the research problem to guide my data collection and analysis towards a better understanding of the varied causes and impacts of energy poverty. Ultimately, this better understanding will enable the positing of practical recommendations and better policy frameworks that also target energy poverty through the five forms of capital it is related to. In the next chapter, where I present the research methodology, this is further detailed.

Chapter 4 Methodology

Introduction

This chapter first revisits the research questions (Section 4.1) in accordance with the research gap and the theoretical framework chosen. Next, the ontological and epistemological perspectives adopted are explained in Section 4.2, revealing the worldview through which I conducted this research and my pragmatic perspective towards "real-world" problems and solutions. The chosen methodology (Section 4.3) utilises a mixed methods research approach–the data collection and analysis procedures used both qualitative and quantitative methods. I discuss the quantitative data analysis in Section 4.4. The latter takes advantage of a rich secondary survey dataset, and rigorous procedures for quantitative analysis are included to make sure the dataset fits into the research objectives. Important aspects pertaining to the qualitative data collection and analysis, such as the justification of the choice of method, the interview guide, the efforts to select and recruit interviewees, and the use of thematic analysis are detailed in Section 4.5. Finally, how the research was conducted concerning ethical issues, the changes required in participants' recruitment during COVID and the data management strategy are explained.

4.1 Research questions

The main research question is: *How is energy poverty understood and experienced by older Australians reliant on government income support?* In order to break down this main question into smaller and achievable goals, four derived questions are put forward:

1. To what extent do older Australians reliant on government income support suffer from energy poverty?
2. What are the current housing conditions of older Australians reliant on government income support and how might they shape their experience of energy poverty?
3. What are the main causes of energy poverty among older Australians reliant on government income support?
4. What is the impact of energy poverty on older Australians reliant on government income support?

4.2 Ontological and epistemological perspectives

No research is paradigm free. Although some researchers conduct their studies without regard to their paradigmatic position, "this does not mean that they do not have one, only that they do not articulate it in their research" (Baran & Jones, 2016, p. 14). Prior to conducting a research study, particularly in social sciences, it is essential to consider how the researcher understands the observed social phenomena, which leads to the dominant research paradigm to be applied. In addition, researchers bring their own worldviews and sets of beliefs to the research project, which have practical implications for how data is going to be collected and analysed to answer the research questions (Creswell, 2007). Therefore, good research requires making these philosophical assumptions and paradigms explicit, so readers are aware how they influence the conduct of inquiry.

Firstly, I present my ontological position. Ontology relates to the nature of reality and its characteristics (Creswell, 2007). This research recognises the relative nature of reality, accepting that it can be different for each person based on their unique understandings of the world and experiences of it (Berger & Luckman 1966 apud Darlaston-Jones, 2007). As Darlaston-Jones (2007, p. 19) concluded, reality "is a consequence of the context in which the action occurs and is shaped by the cultural, historical, political, and social norms that operate within that context and time". Certainly, energy poverty is very personal and contextual, and individuals / households will experience energy poverty differently (Bouzarovski, 2014).

From a pragmatic perspective, "the meaning of a phenomenon derives from its effects on the world" (Dennis, 2011, p. 464) or, in other words, "the reality of the world is constituted by our practical orientation to it" (Williams, 2016, p. 172). In that sense, I understand energy poverty as an important "real-world" phenomenon which may present itself in different ways, i.e., people experience energy poverty subjectively, and that must be addressed with practical solutions that range from government interventions to shifts in household behaviour.

Secondly, identifying the researcher's orientation towards epistemology can help frame the research design and justify the research process and methodology. Epistemology relates to the study of knowledge and the relationship between the researcher and the subject of study (Creswell, 2007; Williams, 2016). Hence, I adopt a more subjective (non-positivist) view of knowledge, admitting there are a variety of truths which are constructed within the context of social relations between the persons who experience it (Gergen & Gergen, 2007). In that

sense, I agree with the assumption that it is fundamental to get as close as possible to the participants being studied and have access to their understanding and knowledge of energy poverty, as first-hand informants (Creswell, 2007). Lastly, I also acknowledge that my own life experience and understanding of energy poverty is brought to the research and developed during it, which is an important ingredient of the research process (Robson, 2002).

The presented ontological and epistemological foundations claim for a subjective approach to the research, focusing on the understanding of the subjective meanings and perspectives of the ones involved in the study—the older Australians reliant on the Age Pension. Furthermore, I aim at deriving knowledge about this "real-world" problem to provide practical solutions to mitigate it, highlighting the consequences and outcomes of the research (Creswell & Creswell, 2018). Therefore, I adopt the pragmatist research paradigm. According to Glasgow (2013), pragmatic approaches can accelerate the integration of research, policy, and practice (namely, the translation of research into practice), as they focus on the context for application of the findings. Creswell (2007, p. 22) explains that individuals holding a pragmatic worldview,

> *Focus on the outcomes of the research – the actions, situations, and consequences of inquiry – rather than antecedent conditions […]. There is a concern with applications – "what works" – and solutions to problems […]. Thus, instead of a focus on methods, the important aspect of research is the problem being studied and the questions asked about this problem.*

However, this does not mean disregarding rigour and data quality issues in scientific methods and research conduct, but actually broadening the focus and placing greater priority on practical issues that have received little or no attention (Glasgow, 2013). In that sense, pragmatism allows researchers to have freedom of choice; they are free to choose the methods, techniques, and procedures of research that best meet their needs and purposes (Creswell, 2007). This is in accord with an exploratory study such as the present one. As Chapter 1 argued, there is an emerging need for further exploring energy poverty in Australia and understanding the needs of energy vulnerable households beyond their inability to heat the home. As Singleton and Straits (2018, p. 109) conclude,

> *Exploratory research is undertaken when relatively little is known about something […]. When exploring a topic or phenomenon about which one knows very little, one necessarily begins with a general description of the phenomenon […]. A researcher may have few, if any, guidelines to help determine what is important, who to interview, or*

what leads to follow. For these reasons, the research plan in an exploratory study is more open than in other kinds of research.

In practice, the researcher with the pragmatic worldview uses whatever methods of data collection to best answer the research questions, possibly employing both quantitative and qualitative methods as long as the data is relevant for making decisions and taking action (Creswell, 2007; Glasgow, 2013).

4.3 Strategy of inquiry – Mixed methods research

As mentioned, the philosophical assumptions and the research paradigm chosen by the researcher directly affect how the research is designed and conducted. The research paradigm sheds light on the relevant research methodology and design, where a set of research methods are employed to endeavor to successfully answer the research questions (Baran & Jones, 2016). Furthermore, scholarly research must aim at methodological congruence, when the purposes of the study, the research questions, and methods of research are interconnected, so that the study appears as a cohesive whole rather than fragmented pieces of research (Morse & Richards, 2007).

I chose to use a mixed methods strategy of inquiry, with an emphasis on the qualitative component, in order to disclose the complexity of the energy poverty issue. As the literature review illustrated, the issue of energy poverty among vulnerable groups in Australia is under-researched. I have chosen to use in-depth interviews to understand older Australians' experience of energy poverty. Williams (2016) argues social life—and, therefore, social issues like energy poverty—cannot be fully understood through impersonal instruments such as surveys or controlled conditions of experiments, because of the infinite variability of human experience and interpretation. This qualitative focus that included the voice of the participants and their different perspectives added original insights to the broader quantitative analysis of the energy poverty condition in Australia.

Mixed methods research has established itself as the "third methodological movement" over the past twenty years, balancing the existing traditions of either quantitative or qualitative movements (Teddlie & Tashakkori, 2009). It considers "multiple viewpoints, perspectives, positions, and standpoints" (Baran & Jones, 2016, p. 44). Mixing methods is an intuitive way of doing research that is well aligned with the pragmatic philosophical worldview and

practicalities of our everyday lives (Creswell & Clark, 2018). It is the type of research in which the researcher can integrate qualitative and quantitative research approaches to gain more insight into a problem, enhance the validity of the findings and develop a deeper understanding of the issue (Creswell & Clark, 2018; Creswell & Creswell, 2018).

Mixed (and multiple—either quantitative and/or qualitative) methods of data collection and analysis, each of them subject to different issues of variability, representativeness and reliability, increase the confidence in the research findings because the strengths of one method offset the weaknesses of another (Johnson & Onwuegbuzie, 2004; Singleton & Straits, 2018). As Creswell and Clark (2018, p. 42) explain:

> *Quantitative research is weak in understanding the context or setting in which people live. Also, the voices of participants are not directly heard in quantitative research. […] Qualitative research makes up for these weaknesses. On the other hand, qualitative research is seen as deficient because of the personal interpretations made by the researcher, the ensuing bias created by this, and the difficulty in generalising findings to a large group because of the limited number of participants studied. Quantitative research, it is argued, does not have these weaknesses. Thus, the strengths of one approach make up for the weaknesses of the other.*

The use of mixed methods is seen as a key feature for achieving triangulation, in order to have greater confidence in one's findings (Baran & Jones, 2016; Tight, 2019). Triangulation of data by combining quantitative and qualitative techniques can serve many purposes. If the data collected and analysed through more than one method shows there is convergence in the findings, it serves the purpose of corroboration or "convergent validation" (Tight, 2019). In that case, usually the quantitative techniques are the most appropriate for corroborating findings from qualitative methods. However, qualitative methods can also be used to provide richness or detail to quantitative findings by expanding, refining and developing the understanding of the phenomenon studied (Rossman & Wilson, 1985).

This study used an inductive approach to answer the proposed research questions. In inductive reasoning, the researcher moves from specific instances to general principles, while trying to infer empirical generalisations from data. In that sense, triangulation of data can improve the confidence of findings, but it is paramount that the evidence supports the conclusions, as there will always be a degree of uncertainty (Singleton & Straits, 2018).

My research design changed due to COVID-19 safety constraints (explained further) and as new information and insights emerged. As Creswell (2007, p. 39) clarifies, "the initial plan

for research cannot be tightly prescribed, and […] all phases of the process may change or shift after the researchers enter the field and begin to collect data". Nevertheless, data collection was structured in two stages, integrating qualitative and quantitative methods, further detailed in the following sections.

Secondary and primary data were utilised. The secondary data which was drawn predominantly from an analysis of the Australian Housing Conditions Dataset[32] (collected by and referenced as Baker et al., 2019) provided greater context and possibly generalised findings. The primary data generated was obtained through semi-structured in-depth interviewing. The intention was to collect data from different sources: interviews, visual observations and analysis of documents.

To answer research questions (1) and (2), I used statistical analysis on secondary data (Baker et al., 2019) to assess what percentage of older people reliant on the government income support (Age Pension) is likely to be experiencing energy poverty and what are some of the demographic, socioeconomic and housing characteristics (tenure type, age, size/type of dwelling, housing quality parameters, etc.) of this group. Previous quantitative studies already identified low-income older people as a group vulnerable to energy poverty in Australia (Azpitarte et al., 2015; Chester & Morris, 2011; Nance, 2013), but these studies do not delve into their characteristics and housing features.

To answer research questions (3) and (4), I conducted 23 semi-structured in-depth interviews with low-income older Australians in the Sydney and Melbourne[33] regions. The interview covered the following topics: housing characteristics; profiling of energy poverty; use of energy at home and strategies to reduce energy consumption; difficulties in paying energy bill; impacts of the energy costs on wellbeing; the impacts of the home on energy usage; and the awareness of energy efficiency programs and other initiatives.

[32] This project was funded by the Australian Research Council and The University of Adelaide, in partnership with The University of South Australia, The University of Melbourne, RMIT University, Swinburne University of Technology and The University of New South Wales to provide timely, systematic and accessible data resource on Australia's housing conditions.

[33] The sampling strategy was modified in light of the COVID situation in order to ensure the research could make a clear contribution to knowledge. This is further detailed in section 4.5.3.

4.4 Quantitative data with analysis of secondary data

In a time where the large amounts of data being collected, compiled, and archived by researchers all over the world are now more easily accessible, the time has definitely come for secondary data analysis […].
(Johnston, 2014, p. 626)

4.4.1 The choice of method

Heaton (2004, p. 16) explains that "secondary data analysis is a research strategy which makes use of pre-existing quantitative data or pre-existing qualitative data for the purposes of investigating new questions or verifying previous studies". In many cases, that exiting data is originally collected by someone else for another primary purpose (Johnston, 2014). Then, the idea behind a secondary analysis is to present interpretations, conclusions or knowledge additional to, or different from, those presented in the primary research (Hakim, 1982). This research method can also be understood under the documentary research strategy, in which the intent is not to create new data but to analyse existing data (Tight, 2019).

There are numerous advantages to undertaking a secondary data analysis. Firstly, it is cost-effective and convenient (Johnston, 2014). Since the data has already been collected, the researcher saves on financial, personnel and time resources related to data collection activities. It is also worth mentioning the accessibility factor of high-quality and large-scale datasets, such as national surveys, collected by funded bodies or agencies. With the technological advancements, transparency principles, and the internet, vast amounts of interesting secondary data have become freely and publicly available online (Tight, 2019).

These factors combined are particularly attractive to independent or unfunded researchers, such as graduate students, "equalising opportunities and building capacity for empirical research" (Johnston, 2014, p. 624). Existing datasets may be larger, more representative and more detailed than what an individual researcher could hope to collect (Tight, 2019). Accessible datasets allow independent doctoral researchers to work autonomously and perform secondary analysis over data the collection of which could never be done alone or in the time and financial constraints of a PhD program. Some other advantages pointed out by Tight (2019) are the benefit of verifying, comparing and replicating existing studies with the formal data sharing, and avoiding the public's resistance to undertaking surveys. The latter is also closely related to the inevitable issue of putting subjects at risk of adverse reactions or other harms associated with participation in surveys (Doolan &

Froelicher, 2009), which is not a problem when performing secondary analysis. Finally, Magee et al. (2006) concluded that the use of existing and appropriate datasets can accelerate the research process and help facilitate the translation of knowledge to practice, which is an important feature of pragmatism.

However, using secondary data in research presents some limitations and additional challenges. First and foremost, there is the evident issue of not participating in the execution of the original data collection process (Johnston, 2014). Because of that, the secondary researcher needs to rely on other sources of information and publications to assure the data collection process was done appropriately and ethically. This also uncovers another potential problem: a major mismatch between primary and secondary research objectives (Kiecolt & Nathan, 1985). If those objectives are very different, the variables needed for the secondary analysis might not be available or in the desired format, requiring further research, combining of distinct datasets, data cleaning and recoding. Secondly, there might be difficulties in accessing the data (in the case of datasets not formally shared or particular primary researchers' proprietary interests) or there might be charges for it. Moreover, the dataset might be poorly documented, posing risks to confidentiality and consequentially affecting data quality and analysis rigour.

Nevertheless, it is clear that the advantages outweigh the potential disadvantages of using existing data for secondary analysis (Tight, 2019). When undertaking secondary data analysis systematically with well-described procedures, it is generally possible to address the limitations noted. Additionally, Kiecolt and Nathan (1985) comment on the possibility of combining the analysis of existing data with other types of primary data to investigate a problem more thoroughly, complement primary evidences and triangulate data for more robust conclusions.

4.4.2 Conducting secondary data analysis

As an emerging data collection and analysis method, there are still few established frameworks available to guide researchers when conducting secondary data analysis (Doolan & Froelicher, 2009; Magee et al., 2006; Smith et al., 2011). Johnston (2014) proposes a three step process, which involves the development of the research questions, then the identification of the dataset, and thorough evaluation of the dataset. By starting with the research questions, the aim is to establish a conceptual match between the primary data

collection and its secondary use and analysis to ensure the rigour of the research findings (Magee et al., 2006). In the case of existing national surveys, for example, primary researchers rarely use all of the data collected and this unused data can provide answers or different perspectives to other questions or issues, but it is important to assess whether there is a fit between the research questions, the theoretical frameworks and the available data (Heaton, 2004).

In the present research, research questions (1) and (2) are answered with secondary data analysis. The main idea is to investigate what percentage of people reliant on the Age Pension are experiencing energy poverty and what are some of the demographic, socio-economic and housing characteristics (tenure type, age, size/type of dwelling, housing quality parameters, etc.) of this group. As mentioned previously, I used the existing dataset of the AHCD (Baker et al., 2019).

In previous studies of energy poverty in Australia, the Household, Income and Labour Dynamics in Australia (HILDA) survey has been used to assess energy poverty indicators such as energy consumption, expenditure and inability to pay energy bills (Azpitarte et al., 2015; Churchill & Smyth, 2021; Daniel et al., 2019; Poruschi & Ambrey, 2018), as well as the ABS Household Expenditure Survey (HES) or the Household Energy Consumption Survey (HECS) (Chester, 2013; Cornwell et al., 2016). I considered using HILDA data initially, particularly because the datasets are quite recent – the 2019 data was made available in mid-2021. However, the dataset, research design and sampling procedures are very complex, and its analysis would be too time-consuming for doctoral research that already includes primary qualitative data collection and analysis. Additionally, this dataset does not contain detailed variables related to housing characteristics – apart from general information, such as housing tenure and type of dwelling, which is not sufficient for my research.

I also used the ABS HECS and HES data in previous published and unpublished works (Porto Valente, 2019; Porto Valente et al., 2020) to explore energy poverty and energy expenditure among older people. However, the HECS survey is from 2012, which means data about energy costs is obsolete, since in the last decade energy prices have almost tripled in most Australian states (AEMO, 2019). Moreover, the most recent HES survey is from 2015-2016, but energy expenditure data is aggregated with domestic fuel, which is not ideal for this research. Nevertheless, there are indicators of financial stress in this survey which are specific to energy poverty, and those are used for comparison with the AHCD findings.

4.4.3 The Australian Housing Conditions Dataset

In contrast to the datasets mentioned, the AHCD project aimed at gathering a robust data infrastructure on the housing conditions of Australians. The main topics in the survey cover the dwelling tenure and accommodation, its construction and maintenance, some information about energy sources, indoor environment and safety, and quality and satisfaction with the home. The questions in this survey allowed me to better investigate Age Pensioners' housing circumstances and their possible correlations with energy poverty. The dataset was made publicly available in March 2019. At the time of writing (October 2021), there were three publications that had used the dataset (Daniel et al., 2019; Liu et al., 2019; Viljoen et al., 2020). None focused on energy poverty. The AHCD dataset, its design, sample and variables are elaborated on below. I am confident that it is the most appropriate and fit dataset for my research, addressing Heaton's (2004) and Johnston (2014) concerns cited above.

After identifying the appropriate dataset to the research, the next step involves a thorough evaluation of it, in order to assess whether the primary method of data collection is also appropriately suited to the secondary research (Kiecolt & Nathan, 1985). Drawing on previous works, Tight (2019, p. 100) considers six practical questions to pose when evaluating a dataset, as seen below. As I did not participate in the primary data collection process, I will refer to the public information and reports available (Baker et al., 2018) to answer these questions.

1) What was the purpose of the "original" study [dataset]?

> *Responding to a call from the research and policy community for a timely, systematic and accessible data resource on Australia's housing conditions, the Australian Research Council (ARC) funded the Australian Housing Conditions Data infrastructure (AHCD) project in 2015. The project has systematically gathered a robust data infrastructure on the housing conditions of Australians.* (Baker et al., 2018, p. 2)

2) What information has been collected?

The survey collected information about housing tenure, its morphology and construction, maintenance and renovation, amenities, satisfaction, and household demographic characteristics (Baker et al., 2018). The questionnaire used to collect the data can be found in Appendix 1.

3) What sampling frame was used, and what is the sampling unit?

> *A total of 4,501 interviews were completed across three States: South Australia, Victoria and New South Wales. The sample was stratified by State (approximately 1,500 per*

State) and the households randomly selected within each State. Dual-frame sampling (i.e. landline and mobile phones) was used in an attempt to capture responses from an increasing proportion of mobile phone only households. (Baker et al., 2018, p. 4).

4) Who was responsible for collecting the data? What is the quality of the data?

The project was funded under the Australian Research Council (ARC) Linkage Infrastructure, Equipment and Facilities funding scheme (LE160100056) in partnership with The University of Adelaide, The University of South Australia, The University of Melbourne, RMIT University, The University of New South Wales and Swinburne University of Technology (Baker et al., 2018). Quality data measures involved checking interview data frequently, having a supervisor for the interviewers, auditing 10% of each interviewer's work and, lastly, interviews at some of the respondents' dwellings to "ground-truth" responses, which included observation of dwelling amenity and quality (Baker et al., 2018).

5) Is the survey nationally representative?

The survey was initially focused on three states (New South Wales, Victoria, and South Australia) to provide a dataset of sufficient depth. Although it is not nationally representative, it is important to highlight that almost two thirds of the Australian population live in these three states. Moreover, this project is designed as a baseline dataset, and its survey can be replicated to add more data in the future.

6) When was the data collected?

Data collection began on the 1 August 2016, in parallel with collection of the ABS Census 2016 data on the 9 August, and was completed on the 7 October 2016 (Baker et al., 2018).

After formally applying online on 4 December 2019, I was granted access to this dataset in its SPSS version by the Australian Data Archive (ADA) on 8 January 2020. However, due to confidentiality issues, there are two variables which are restricted in the dataset – age and postcode. This is not a significant limitation, as that information is aggregated into two other derived variables – age bracket and location.

The institutions and primary investigators involved in this data collection project are well-respected in the academic world and have a reputation for excellence in research integrity. The technical report available details the careful and consistent data collection process, including external validity considerations when designing the questionnaire, such as previous national surveys which have used similar questions, and the thorough procedures for interviewing and coding.

As Johnston (2014) explains, the secondary analysis of data is an empirical exercise that applies the same basic research principles as studies utilising primary data. Evaluating how the original data was collected helps the secondary researcher to assess how issues of sampling, response rates, and missing responses were handled in the original research (Kiecolt & Nathan, 1985), as well as to address issues of validity and reliability (Magee et al., 2006).

Although the available dataset has already some degree of data preparation and cleaning for missing responses, there is still some recoding and operationalisation of new variables to suit this research purpose. This is discussed in the following sections, after presenting the sample and the profile of the survey participants.

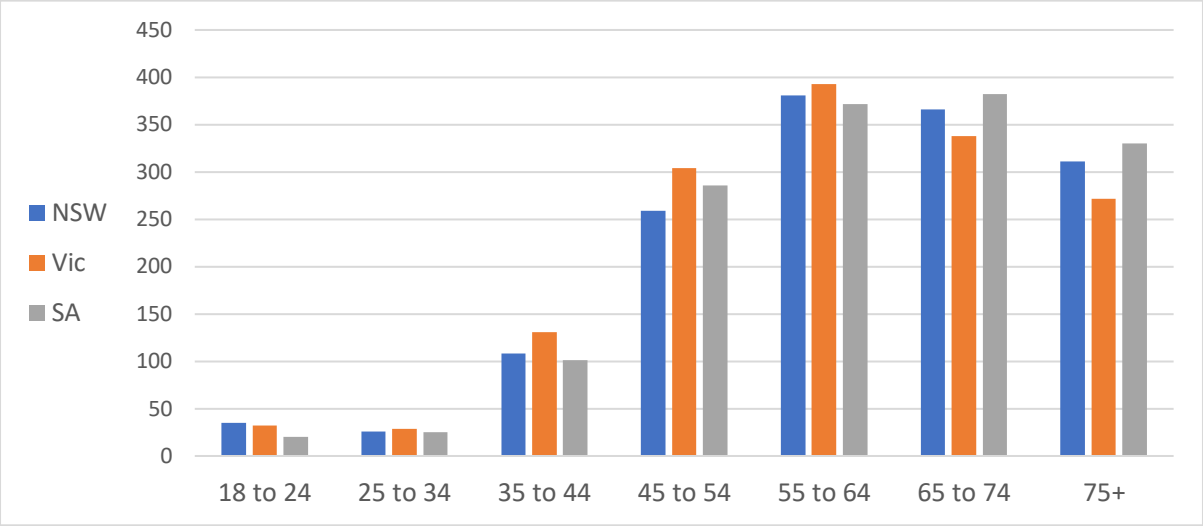
4.4.4 Sampling and profile of participants

Out of a total of 18,839 telephone numbers used, as mentioned previously, 4,501 interviews were completed across South Australia, Victoria and New South Wales – approximately 1,500 per State – and the households were randomly selected within each State. Although it is not a nationally representative sample, the dataset includes a weighting variable to account for biases inherent in the data collection process.

> *The weighting procedure known as 'raking' was used to weight the respondents by probability of selection within the household and by age group, sex and area (metropolitan/country) for each state using the June 2015 ABS Estimated Residential Population so that the estimates are reflective of the structure of the state […]. As each state involved a discrete sample, these were weighted separately to enable state level analyses. (Baker et al., 2018, p. 7).*

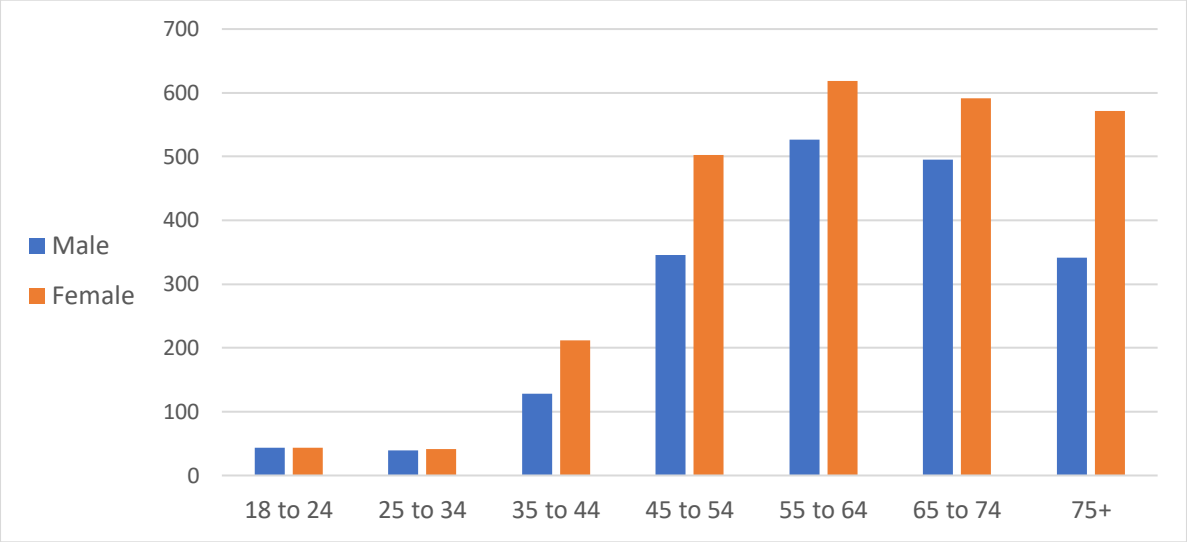
In the case of this particular research, the overrepresentation of older female women does not pose a problem, as the emphasis is on the older population. Non-weighted data are easier to analyse and interpret, and its use is accepted when exploring associations among variables, especially in exploratory research, which is the present case (Magee et al., 2006). The figures presented next display unweighted frequencies of some demographic characteristics to provide a profile of the participants. As seen in Figure 4.1, the participation across states is similar. In regard to gender, there is a slight overrepresentation of women in the sample, as seen in Figure 4.2.

Figure 4.1 - State mapping per age bracket



(Source: the author using the dataset from Baker et al., 2019)

Figure 4.2 - Gender per age bracket

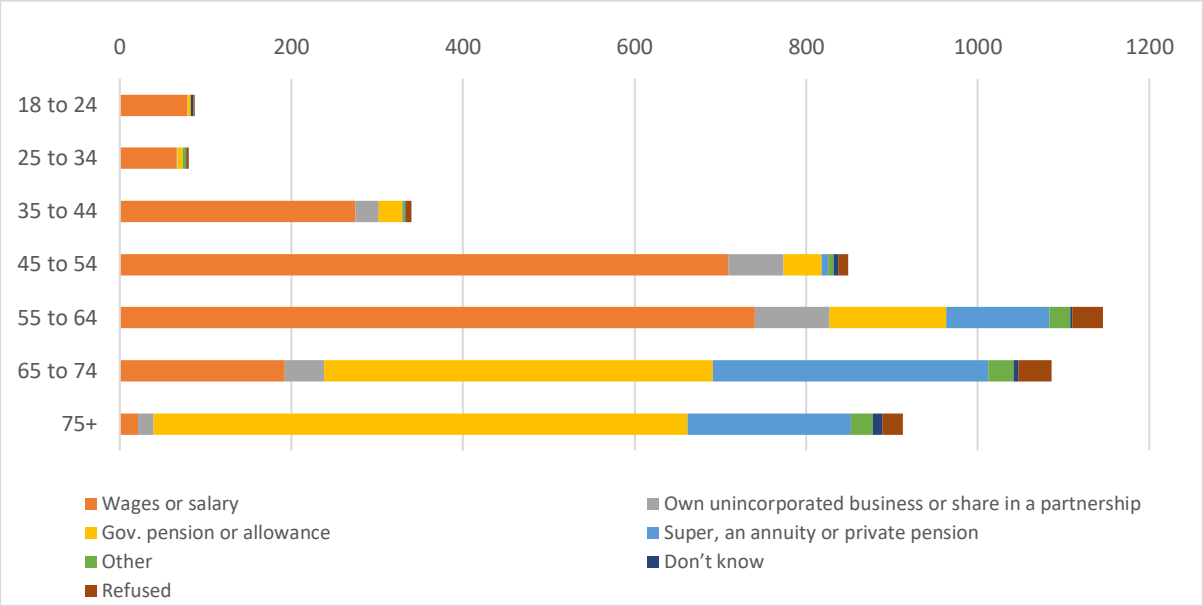


(Source: the author using the dataset from Baker et al., 2019)

For their main source of household income[34], Figure 4.3 shows that, among the older population groups, there is a significant participation of those reliant on government pensions, which is pertinent for the present study.

[34] Question Z.5 (see Appendix 1 for AHCD survey questionnaire) asks respondents about their household's main source of income. Whilst there are a range of government assistance payments available to support older Australians, the vast majority (around 95%) of Australians aged 65 and over who receive a government pension are Age Pensioners (AIHW, 2021d). Thus, the quantitative analysis conducted in this research takes the survey respondents' answer of household's main source of income as government pension or allowance as a proxy for mainly reliant on the Age Pension, and often referred to in Chapters 5 to 8 as Age Pensioners.

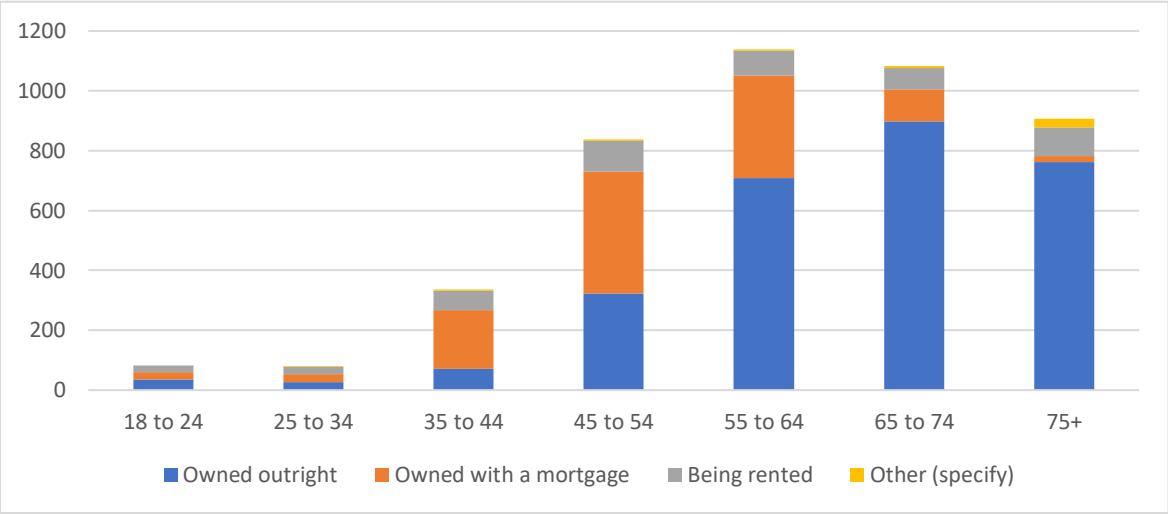
Figure 4.3 - Main source of household's income per age bracket



(Source: the author using the dataset from Baker et al., 2019)

In terms of housing tenure, there is an overrepresentation of homeowners in the sample (Figure 4.4), possibly due to the greater participation of older groups. As official statistics from 2016 Census (ABS, 2017) indicate, of occupied private dwellings in Australia, 31% were owned outright, 34.5% were owned with a mortgage and 30.9% were rented.

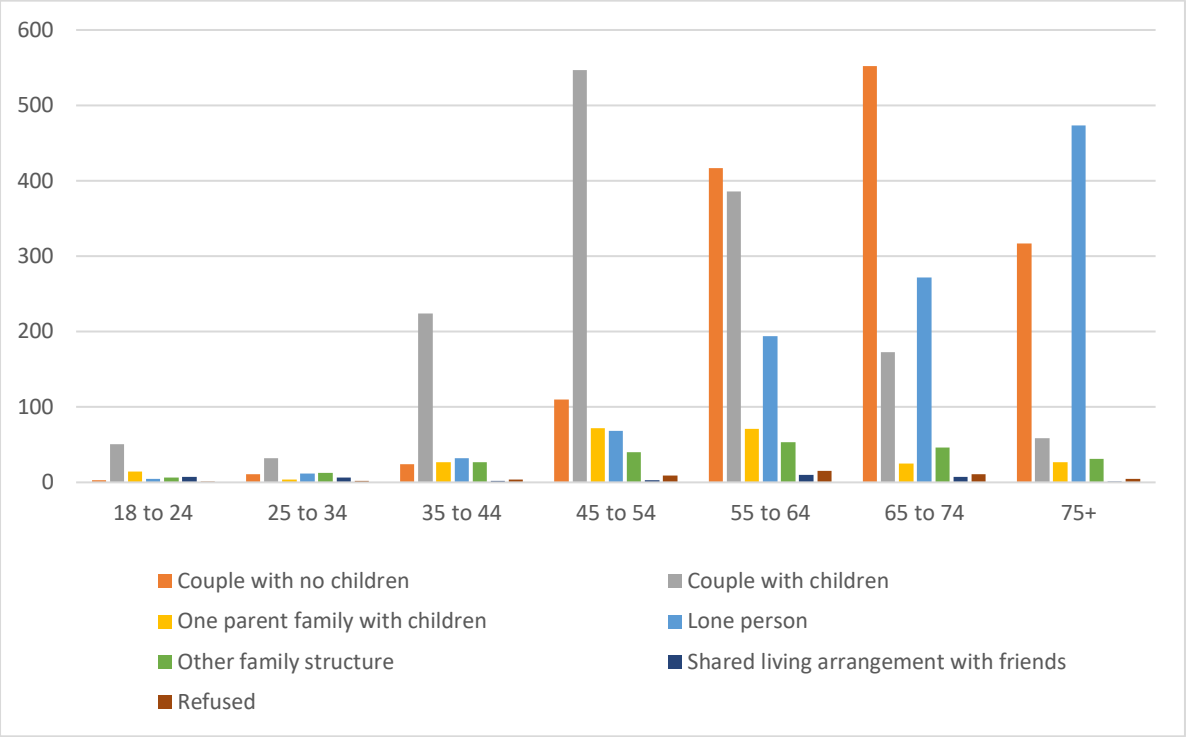
Figure 4.4 - Housing tenure per age bracket



(Source: the author using the dataset from Baker et al., 2019)

Finally, for the household family structure, Figure 4.5 details, as expected, that the majority of older household groups are of couples with no children or lone persons.

Figure 4.5 - Household family structure per age bracket



(Source: the author using the dataset from Baker et al., 2019)

4.4.5 Variables for analysis

Although existing surveys provide numerous possibilities for research, the data (like the social world that produces those) are often far from perfect (Kiecolt & Nathan, 1985). As Magee et al. (2006, p. 51) comment,

> *With so many variables from which to choose in large data sets, the impulse to select interesting variables can be almost irresistible. […] The conceptual fit, the theoretical framework, and the research question should be used together to limit the selection of variables to only those items or variables that are conceptually meaningful.*

Selecting, operationalising, measuring the adequate variables and preparing the dataset for further analysis are important steps in the secondary data analysis process (Doolan & Froelicher, 2009). The poor selection of variables from which the analysis occurs poses a significant risk to both external and internal validity of the study (Smith et al., 2011). Moreover, surveys may not contain the precise indicators of the concepts the secondary researcher wants to study, requiring some variable operationalisation, such as recoding and computing of new variables from existing variables (Kiecolt & Nathan, 1985).

Classifying the data

Variables can be classified into dependent, explanatory or extraneous variables (Singh, 2016). Dependent variables might be modified by independent/explanatory variables. Having in mind that my research aims at understanding which sociodemographic variables and housing conditions might contribute to energy poverty, below, I classify the variables in the dataset.

1. Dependent variable – The Energy Poverty Index, a new variable computed from other existing dependent variables, such as ability to keep warm in winter, ability to keep cool in summer, inability to pay electricity bills, and inability to heat the home.
2. Explanatory variables – The majority of variables in the dataset, such as tenure, years lived in current dwelling, dwelling type, dwelling age, number of bedrooms, construction (roof and outside wall materials) and maintenance (need for repairs), dwelling modifications, main source of energy/fuel, quality and satisfaction with dwelling, housing costs and financial strain, and respondents' health status and demographic characteristics (age bracket, gender, source of income, family structure). For comparison purposes, particularly with respect to heterogeneity in responses across different sources of income, part of the analysis was carried out on all older respondents (over 65 years of age). It was possible to identify, for instance, differences between self-assessed quality of the dwelling between those reliant on the government Age Pension and those who received superannuation, private pension, wages or salary. Other parts of the analysis were carried out solely on those who were over 65 and reliant on the Age Pension, in order to better understand their perspectives.
3. Extraneous variable – Not part of the study as per conceptualised design but may affect the outcome of a study. Although the dataset includes variables regarding car parking, outdoor space, noise issues and moving intentions, which are not particularly relevant for this data analysis, none of the variables were removed from the dataset.

Basic data management

In terms of data management, the whole quantitative analysis was performed using SPSS and exported to Excel for further analysis and visualisation. Recoding of existing variables into different variables to match research questions needs (the original variables were kept in the file in case of errors or mistakes with the recoded variable), and computing of new

variables, such as the Energy Poverty Index as a sum of other recoded variables, were conducted prior to the analysis. For the selection of cases, although I focused on the older population (65 years old and over) reliant on the government Age pension, part of the analysis used the entire older group for comparison purposes. A pilot study with the dataset was undertaken to determine if there were any problems with the variables before a thorough analysis. In Appendix 2, the recoding and computing of variables is presented.

4.4.6 Procedures of analysis

As this is exploratory research, the focus is on the descriptive statistics of the data, aiming at describing, summarising, or explaining a given dataset (Singh, 2016). Recapitulating the research questions presented in the beginning of this section, the analysis aimed to investigate what percentage of older Australians on low incomes is likely to be experiencing energy poverty and what are some of the demographic, socioeconomic and housing characteristics (tenure type, age, size/type of dwelling, housing quality parameters, etc.) of this group. Thus, frequency distribution of variables and their univariate analysis, in regards to central tendencies and standard deviation were analysed.

To explore whether Age Pensioners' different housing circumstances affect their experience of energy poverty, I employed simple bivariate analysis to determine the existence of relationships between two different variables. The graphic representation of the data in different types of charts is also an effective way of summarising the information visually and inferring potential relationships. Whenever appropriate, different coefficients of correlation, as measures of association, were used depending on the nature of variables (Singh, 2016). For example, in the case of analysis of two categorical (nominal) variables resulting in large tables, the contingency coefficient (another chi-square distribution analysis proposed by Pearson and varying between 0 and 1, where 0 means complete independence) was employed. With mixed variables, as in the case of the independent variable is nominal (e.g., the energy poverty indicators) and the dependent variable is on an interval scale (e.g., income level), Eta, a coefficient of nonlinear association also known as correlation ratio, was more appropriate. In the few cases where both variables were ordinal, Spearman correlation was employed, and where both variables were intervals, Pearson's R was used. Whenever appropriate, the correlation coefficient value is represented by "r", and the significance of correlations is reported as the "ρ" value. In some analysis, the significance results were affected by the small

sample size, particularly in questions which were not answered by the entire sample. No multivariate analysis was undertaken, mainly due to time constraints.

After a brief pilot study of main variables, as mentioned previously, the quantitative analysis was conducted in 4 stages. The first stage involved univariate and bivariate analysis of variables related to the older group's demographics, socioeconomics, and health information, with a purpose of understanding the sample. Subsequently, a similar analysis was conducted for their housing conditions, aiming at exploring differences between groups of older Australians. In a third moment, I conducted the analysis and cross-tabulations of the variables related to energy poverty and their potential correlations with the variables studied in the preceding stages. Lastly, an analysis of how specific housing conditions could be related to certain health conditions complemented the study. The variables analysed and cross-tabulated can be found in Appendix 3.

4.5 Qualitative data with semi-structured interviews

> *When the research involves obtaining a sense of how individuals view their situation and what their experiences have been around the research topic under consideration, in-depth interviewing is an appropriate method. […] Any research question that can be answered by people talking about their experiences lends itself to in-depth interviewing (Morris, 2015, p. 8).*

4.5.1 The choice of method

The semi-structured in-depth interview is the most common qualitative research method. It is particularly useful when the researcher is less interested in measuring and more interested in describing and understanding complexity (Arksey & Knight, 1999) through "intense listening, respect for and curiosity about what people say, and a systematic effort to hear and understand what people tell" (Rubin & Rubin, 1995, p. 17). It is a powerful method as it allows the researcher to obtain an understanding of the social reality under consideration through accessing interviewees' thoughts, experiences, feelings, interpretations and perceptions of the research topic (Denscombe, 2010; Morris, 2015). As Hitchings (2012) argues, interviews can be particularly useful to understanding social practices—like the use and needs of energy at home— as interviewees are encouraged to reflect upon their taken for granted routines.

In-depth interviews allow the researcher to gain valuable insights based on the depth of the information gathered and the wisdom of "key informants" (Denscombe, 2010). It is a versatile method and can be used to study a variety of topics especially when the researcher is interested in using the material generated to make an impact on public perceptions and policies (Morris, 2015). Previous studies on energy poverty have also used qualitative methods. Chester (2013), for example, used interviews and focus groups with around 130 low-income households predominantly aged between 25 and 65 years old (84%) to investigate the impacts and consequences for low-income Australian households of rising energy prices. Judson et al. (2019) employed interviews when exploring the effectiveness of small scale photovoltaic installations and energy performance feedback in alleviating energy poverty for eight female sole parent households aged from 20 to 54 years old in a cooperative housing in the western suburbs of Melbourne. The Bankwest Curtin Economics Centre (2016) conducted 18 semi-structured interviews with vulnerable household members (between 20 and 80 years old) to understand their perceptions of energy poverty in Perth, Western Australia. Studies in Europe and the US have also used similar qualitative approaches (Baudaux et al., 2019; Day & Hitchings, 2009; Hernández, 2016).

As per Kvale and Brinkmann (2009, p. 20), research interviews can be understood through the pragmatic lenses when there is the intent of "producing knowledge worth knowing – knowledge that makes a difference to a discipline and those who depend on it". It is critical to deepen the understanding of how Australian Age Pensioners use energy, cope with energy poverty and how it affects their health and wellbeing. In-depth interviews allowed me to obtain this understanding and contribute towards energy poverty mitigation strategies to counter these issues.

However, in-depth interviewing has limitations that need to be acknowledged. Besides being time-consuming for collecting and analysing data, it is harder to ensure anonymity (therefore, confidentiality issues arise) and there are risks of invasion of privacy, the interviewer effect and bias (Arksey & Knight, 1999; Denscombe, 2010). Another limitation is that data obtained from interviews cannot be generalised to the population (no statistical representation). My research is focused on the generalisability of the concepts, the theoretical representation and the practical significance of the findings (whether the results are useful in the real world), rather than the statistical generalisation (Kirk, 1996). Further data quality considerations will be explored in the following sections.

4.5.2 The interview guide

The interview guide was carefully designed (see Appendix 4) to capture representations of the issues concerning energy poverty drivers and its impacts on capabilities. The interview guide had six main topics to be covered in approximately 1 hour (with the possibility of follow-up contact): background and housing characteristics; use of energy at home and strategies to reduce energy consumption; the impacts of the home on energy usage; difficulties in paying the energy bill and profiling of energy poverty; impacts of the energy costs; and the awareness of energy efficiency programs and other initiatives.

There were different types of questions to stimulate different responses and give space for insights. For example, I asked them what their main uses of electricity (and gas, if applicable) were and whether there were any particular activities in their daily routine (or health condition) that made it easier or more difficult to change their energy consumption. These questions often prompted follow-ups and probing on what they considered to be essential energy practices and to what extent they felt they had flexibility to alter their energy use[35]. Unsurprisingly, being semi-structured, there was a good deal of digression and questions and probes that were not initially in the interview guide were asked, so that new information could emerge. Table 4.1 depicts the types of questions and some indicators which are addressed by the interview guide questions.

The questions asked had a clear connection to the concepts described in the theoretical framework. Background and behaviour questions, for example, aim at understanding personal traits of the interviewee and their habitus. The theme of "being in energy poverty and impacts on health" probed the capabilities being deprived of due to energy poverty, and the theme on the "awareness of assistance programs, rebates and EAPA vouchers" explored their energy literacy and cultural capital with respect to the issue.

[35] These interview questions also accord with the underlying theoretical assumption that energy is a means to an end of achieving secondary and basic capabilities that can be different for each person and their context (Day et al., 2016; Hui et al., 2018).

Table 4.1 - Types of question, explanation and interview main themes

Type of Question	Explanation	Interview Guide Themes
Background	Probe personal characteristics of the interviewee	Household composition Household day-to-day routine and use of energy Dwelling characteristics (age, type, materials)
Experience/behaviour	What a person does or has done	Perception of energy poverty and its impacts Strategies to cope with energy poverty and reduce energy consumption Maintenance or retrofits done to home Changes in the use of dwelling spaces and appliances
Feeling	To understand an interviewee's emotional responses to their experiences	Being in energy poverty and impacts on health Being on hardship programs or even disconnected
Knowledge	About their factual knowledge of a situation, policy or process	Awareness of assistance programs, rebates and EAPA vouchers
Sensory	Attempt to have interviewees describe the stimuli to which they are subject	Thermal comfort in the house Respiratory issues due to mould and damp Seasonal differences (winter/summer specific issues)
Opinion/value	What their opinion is of something related to the topic under investigation	Effectivity of rebates, assistance programs and EAPA vouchers and recommendations Satisfaction with home Energy efficiency retrofit programs Coping with higher energy prices and higher temperatures

Source: adapted from Morris (2015)

4.5.3 Selecting, finding and accessing interviewees

When selecting participants, the following features of older Australians were prioritised: being primarily or solely dependent on the Age Pension, experiencing difficulties with energy bills or energy providers, restricting energy use at home, and living in Sydney or Melbourne. Their reliance on the Age Pension meant that they all had a limited income – a major cause of energy poverty. However, as presented next, some outliers were included in this research due to their extreme experiences of energy poverty at an older age.

Recruitment of interviewees

The entire interview process, from recruitment to data collection, was in accordance with the ethical standards of the UTS Human Research Ethics Committee (Approval Reference No. ETH19-4018 – See Appendix 5). An arm's length recruitment approach was used in this purposive sampling directed to typical cases/circumstances. Initially, the interviews were to be carried out in the Inner West Local Government Area (LGA) of Sydney. The Inner West LGA was chosen for three reasons: convenience of proximity for the researcher, especially for travel

purposes; the already existing research relationship between council representatives and the university; and the council's ongoing concern over their Senior's health and wellbeing. A meeting with the Inner West Council team was held on 1 October 2019. Several members were present and agreed to help advertise the research, but not be involved in the direct recruitment of participants. In terms of Council activities, they would:

1. Support the promotion of the research through their networks, data bases, newsletters, and some public noticeboards/ library locations.
2. Electronic promotion through Councils senior and environmental networks.
3. Support for interviews to be held at some of Councils' libraries and community centres.

I also visited several community centres in the area and asked the council's permission to briefly publicise the research at relevant Seniors' events, avoiding direct personal contact and giving all potential participants the freedom to make contact afterwards. Finally, I attended the NSW Seniors Festival Event held in February 2020 in Marrickville (an inner-city Sydney suburb), where I had the opportunity to run a table and speak to attendees about the research.

Unfortunately, the hands-on recruitment drive was severely disrupted by the COVID-19 pandemic. The lockdown[36], social distancing and self-isolating measures meant it was not possible to continue with the community centre visits and offline advertisement. So, contact with relevant institutions such as St. Vincent de Paul, the Combined Pensioners and Superannuants Association (CPSA), Shelter NSW, the Public Interest Advisory Centre (PIAC), the NSW Council of Social Service (NCOSS), the Housing for the Aged Action Group (HAAG) and the Council on the Ageing NSW (COTA NSW) was enhanced to facilitate online and offline advertisement trough their networks, publications and newsletters[37].

By switching to an online recruitment strategy due to pandemic restrictions, access to energy-poor households who were digitally excluded was limited but still happened through direct contact between the institutions and potential participants. In the case of St Vincent de Paul and HAAG, both of which provide direct assistance to households experiencing vulnerability, their contacts database was a rich resource for potential participants. For other

[36] According to Storen and Corrigan (2020) from the Australian Parliamentary Library, the first NSW coronavirus COVID-19 case was reported on 25 January 2020, and the first death, on 3 March 2020. The first stay-at-home and social distancing orders and bans on non-essential activities were stated by the NSW Government Minister for Health on 18 March 2020. In June 2020, restrictions were gradually eased in NSW but Seniors events in community centres remained a risk and not advisable. Concomitantly, in June 2020 Victoria entered a second wave of infection and tighter restrictions, that lasted over 100 days.

[37] Examples of the online material advertised through those networks is included in Appendix 6.

organisations, such as the CPSA and the COTA NSW, newsletters were sent to a broader audience of older Australians, not all necessarily in hardship situations. However, as seen in Appendix 6, the text in the recruitment advertisement targeted those who felt they were struggling with their bills and their bills consumed a lot of their income, with the possibility of receiving free advice about their energy costs after the interview. The latter potentially motivated participants to take part in the study. It is worth acknowledging that by choosing an arms-length and mostly online recruitment approach, it was completely up to participants to self-recognise themselves as experiencing energy hardship and decide to be part of the study. This perhaps limited my ability to fully understand some aspects of hidden energy poverty.

Whenever contacts at those above-mentioned organisations (and other NGOs who provide energy hardship assistance) knew an older person in energy poverty who was willing to be interviewed, communication was directly sought. Because recruitment efforts were now online, three interested participants from Melbourne were included. One of my supervisors has done previous research with older people in vulnerable situations in Sydney and some of them were considered potential interviewees for this research. Hence, he contacted them and asked if they would be willing to participate in this study. Interestingly, some of them did not fully recognise themselves as energy-poor but agreed to be interviewed because they were reliant on the Age Pension, were social housing tenants, and had 'very conscious' energy practices to reduce energy bills. This enabled a better understanding of hidden energy poverty aspects not elicited by online recruited interviews. Surprisingly, no participants were recruited through the snowballing technique, which might have been due to interviewees having low levels of social capital. Over the course of 2019-2020, 23 low-income older Australians were interviewed (see Table 4.2) of whom 17 were solely or primarily reliant on the government Age Pension for their income. The focus was on older Australians, however there were five outliers of which three were in the fifties and two were in their early sixties. Of the five outliers, two were reliant on their own minimal savings, one on the unemployment benefit and two were dependent on the Disability Support Pension (a government benefit) for their income. I decided to include these interviewees due to them being in a very similar position to the interviewees on the Age Pension with respect to income and frailty. Noteworthy, is that 18 of the 23 interviewees were female. In addition, the majority of interviewees were social housing tenants. As illustrated in later chapters, housing tenure was a key factor with respect to the depths of energy poverty.

Table 4.2 - Profile of interviewees

Pseudonym	Date of Interview	Quality of Interview	Location in Sydney	Gender	Age	Household Composition	Main Income Source	Source of Energy	Housing Tenure
Bill	12/12/2019	3	Inner ring	M	70	Single	Age pension	Electricity	Social housing
Gloria[38]	12/12/2019	3	Inner ring	F	70	Single	Age pension	Electricity	Social housing
Charles	18/02/2020	3	Inner ring	M	70	Couple	Age pension	Electricity and gas	Social housing
Lauren	04/03/2020	3	Middle ring	F	87	Single	Age pension	Electricity and gas	Homeowner
Iris	04/03/2020	5	Inner ring	F	77	Single	Age pension	Electricity	Affordable rent
Mary	05/03/2020	2	Middle ring	F	70+	Single	Age pension	Electricity and gas	Homeowner
Megan	05/03/2020	1	Inner ring	F	93	Single	Savings	Electricity and gas	Homeowner
Adam	06/03/2020	5	Middle ring	M	63	Family with child	Wages and salaries	Electricity and gas	Homeowner
Sonia	11/03/2020	5	Outer ring	F	74	Single	Age pension	Electricity	Private renter
Anna[39]	13/03/2020	5	Not fixed	F	51	Single	Disability pension	Electricity and gas	Private renter
Amelia	25/03/2020	5	Inner ring	F	70	Single	Age pension	Electricity and gas	Social housing
Phoebe	02/04/2020	4	Middle ring	F	71	Single	Age pension	Electricity	Homeowner
Samantha	21/04/2020	5	Inner ring	F	77	Single	Age pension	Electricity	Social housing
Janine	30/04/2020	5	Inner ring	F	64	Single	Savings	Electricity and gas	Social housing
Denise	09/06/2020	5	Outer ring	F	77	Single	Age pension	Electricity	Social housing
Chloe	14/07/2020	2	Outer ring	F	70	Single	Age pension	Electricity	Affordable rent
Marisa	15/07/2020	2	Outer ring	F	70	Single	Age pension	Electricity	Affordable rent
Rose	17/07/2020	5	Outer ring	F	65	Single	Age pension	Electricity	Affordable rent
Daniel	21/08/2020	5	Outer ring	M	53	Single	Disability pension	Electricity	Social housing

[38] Bill and Gloria were interviewed together and shared similar views on the research subject. They are partners but live in different units.

[39] Anna is an outlier. She does not fit the original inclusion criteria, but her dramatic story of becoming homeless and having to house-sit due to energy poverty and other housing issues meant she was worthy of being included in the study. She also provided interesting information about her mother's experience of energy poverty.

Violet	24/08/2020	5	Melbourne	F	67	Single	Age pension	Electricity and gas	Social housing
Jessica	26/08/2020	5	Melbourne	F	65	Single	Age pension	Electricity and gas	Social housing
Jasmine	27/08/2020	5	Melbourne	F	53	Single	Unemployment benefit	Electricity	Social housing
Anthony	04/12/2020	4	Outer ring	M	69	Single	Savings	Electricity	Homeowner

All participants were recruited voluntarily, and their consent was based on sufficient information (see Appendix 7 for Participant Information Sheet and Consent Form). They were fully informed about the purpose, methods and intended possible uses of the research, what their participation in the research entailed and the minimal risks involved. Obviously, they were given the right to withdraw at any stage of the research. Due to COVID-19, online or verbal consent was accepted. The sensitivity of the interviews meant that interviewees were given every opportunity to stop the interview at any point. It was made clear that they did not have to answer a question if they felt it was too challenging. The information sheet given to interviewees provided details as to where counselling could be obtained if required.

The interviews were audio-recorded with two different devices – for the purpose of facilitating data gathering and analysis – with the permission of participants and transcribed by me. The transcription was made available to interviewees whenever they wanted it to ascertain whether they felt comfortable with what would be analysed to generate the research findings. Care was taken to guarantee their privacy and confidentiality. A brief 2-page report with the field notes and the main impressions and takeaways was prepared shortly after the interview to complement data collection and improve data records.

The interviews were initially designed to be conducted face-to-face in a quiet and safe public space, such as a community centre nearby, a local council office or a public library. Due to COVID-19, the last face-to-face interviewee was Sonia (eight face-to-face interviews in total) on 11 March 2020. Subsequent interviews were phone interviews (twelve in total), except for Anna and Chloe, who responded to questions via email. Although face-to-face interviews facilitate the development of rapport and enable the observation of body language, there was not much difference on the quality of phone interviews (as also perceived by Morris, 2015; Sturges & Hanrahan, 2004). The flexibility, safety, and anonymity of being interviewed by phone at home in a convenient time for participants made them feel comfortable with the process. Following Morris's (2015) advice, I made sure there was a relaxed and casual atmosphere during the interview and took advantage of the unfortunate common ground of the COVID-19 pandemic to break the ice and initiate an easy conversation. Furthermore, I reiterated in the phone interviews that I was genuinely interested in learning about their experiences, and that their participation was meaningful and would make an important contribution to the study. As body language is not relevant to phone interviews, I was careful

to use a soothing tone to hopefully make interviewees feel relaxed. No interviews were held via Zoom or other online interface.

4.5.4 Personal reflection on the interviews

Kvale and Brinkmann (2009) describe interviewing as a craft – skills are learned by intense practice. Rubin and Rubin (1995) have a similar perspective: interviewing as the art of hearing data. Reflecting on the interview process and the quality of interviews, I believe my questioning technique improved with time. In the first couple of interviews, I feared probing and possibly asking something too personal, and ended up with not very deep answers. As interviews progressed, I was able to realise when and how to probe for richer, more detailed responses while ensuring I was not stressing interviewees or addressing a very sensitive matter unduly.

Because some interviewees were from CALD backgrounds, I felt that in those interviews I had to probe more and clarify the meaning of some words. I feared the interviewer effect of maybe leading them to give me a "desired answer". Nevertheless, I tried to be as impartial as I could, and I always gave them enough time to elaborate their thoughts and answers without trying to guess the words I thought they were thinking of.

I also noticed some of the questions I wrote initially needed clearer wording, such as when I asked them about their day-to-day routine and how they used electricity and gas through the course of the day. In contrast, some questions I did not think of initially were later included in the interview guide, as I realised the subject was of importance for many interviewees. For example, how they paid the energy bills (whether online or going to an Australian Post Office) was a topic that often came up in terms of accessibility and computer literacy, which is a capability that affects energy literacy and, therefore, energy poverty.

Lastly, as mentioned, COVID-19 affected the mode through which interviews had to be conducted; only phone interviews were permitted to ascertain participants' safety. Despite the disruption in the recruitment strategies, I also noticed how different and more challenging it was to build rapport with interviewees through the phone and, as a result, I realised that I needed to let the interviewee talk more freely and sometimes digress from the interview guide. My face-to-face interviews lasted about one hour, and my phone interviews were generally longer, around 1.5 hours. Finally, I also added one question concerning the COVID-19 self-

isolation impacts on their patterns of energy use, to investigate whether there was any change in their energy consumption and costs.

4.5.5 Analysing the interview data

To analyse the interview data, I used the thematic qualitative analysis approach. It consists of reducing the raw data to codes, categories and emerging themes from which meaning is drawn from and connected to the concepts being studied (Miles & Huberman, 1984; Saldaña, 2009). Themes, as described by Braun and Clarke (2006, p. 82), capture "something important about the data in relation to the research question, and represent some level of patterned response or meaning within the data". At a pre-analysis stage, the preparation of the brief reports acted as summaries of the discussed topics and helped me to look for internal consistency and familiarise myself with the main concepts even before doing the complete coding and analysis using NVivo[40]. The main emerging themes or issues were also used to improve the quality of subsequent interviews.

After the interviews, I followed Braun and Clarke's (2006, 2021) suggestions on the important steps towards conducting a thematic analysis: familiarising myself with the data, generating initial codes, searching for potential themes among coded material, developing, refining and reviewing the themes, and finally writing up the findings chapters.

The first data preparation involved transcribing verbatim the audio recordings into text and carefully reading for notetaking and "memoing" of key aspects and assessing quality. I focused on notable quotes that captured those key aspects to interpret their meaning into a coding scheme according to the main topics discussed (Morris, 2015). Later, I prepared and loaded the data to NVivo software, looking for obvious recurrent themes or issues, coding, grouping the codes into categories or themes, comparing the categories and themes and looking for concepts that encapsulated the categories (Denscombe, 2010). The iterative cycles of analysis also involved selecting the themes that would be focused on when writing up the findings and interpreting the interview data, drawing on the themes identified and the theoretical framework.

[40] NVivo is a software program developed by QSR International and used for qualitative data analysis. Its features help researchers organise, analyse, visualise, and find insights in unstructured or qualitative data (text, audio, video, image, etc.).

The following themes were used as a first guide for the thematic analysis. They were also the main themes on the interview guide:

1) Background and housing characteristics ;
2) Use of energy at home and strategies to reduce energy consumption;
3) Paying the energy bill, budgeting and difficulties with bills and providers;
4) Impacts of the cost of energy on finances, home comfort and physical and mental health;
5) The impacts of the home on energy usage;
6) Awareness of assistance programs, rebates, EAPA vouchers and home energy efficiency programs.

However, during the early-stage analysis of the first interviews, I realised the need to keep an open mind about coding and, in this sense, conduct a more inductive open coding process. Recurrent themes, which were also closely related to the energy poverty issue and the theoretical framework emerged, such as:

1) Energy poverty being affected by capabilities related to cultural capital, such as energy literacy or computer literacy;

2) Lack of control (agency) over energy use affecting energy consumption at home – particularly in the case of older people in social housing or the private rental sector;

3) Feelings of pride or shame, related to their symbolic capital, discouraging older people from approaching charities or family for assistance with their energy bills;

4) Hidden energy poverty, i.e., the under-consumption of energy, and energy usage patterns not comparable to the average Australian household.

To maximise analytical rigour, I took extra care to minimise researcher effects and bias. Using memos to track the research progress helped the iterative and cyclical analysis process, which lasted almost six months. Self-reflections on the processes also enhanced rigour and enabled me to identify opportunities for improvement. During the analysis process, I employed patterns matching to identify similarities and differences across cases and within cases. Referring to the literature allowed me to compare relevant codes and themes in different contexts, and to triangulate the data and assess whether findings were consistent with previous research. Lastly, I endeavoured to make the analysis process transparent, so that it was possible to trace back where the conclusions came from.

In respect to issues of analytical rigour:

1. Reliability (Dependability) – I developed a codebook with short descriptions of main aggregated codes to make sure codes were used across transcripts consistently.
2. Validity (Credibility/Trustworthiness):
    a. Internal Validity – I endeavoured to ensure that the theoretical framework built upon previous literature was clear and that the connections between the concepts were correct. Understanding the main drivers and impacts of energy poverty through the forms of capital allowed for different connections to emerge, as mentioned previously with the recurrent emerging themes. Additionally, direct quotes from interviewees are used throughout the analysis to summarise and substantiate the arguments being made, while offering an opportunity to "give voice" to those who, otherwise, tend to be marginalised (Hitchings & Latham, 2020).
    b. Face validity – Whenever possible, findings were compared against the literature in Australia and triangulated with quantitative findings (explained next).
    c. External validity – I assessed whether the findings were in line with previous research, particularly the European studies where energy poverty research is more established.

4.5.6 Ethical considerations

The research was designed, reviewed and undertaken to ensure integrity, quality and transparency. Being aware of the Australian Code for the Responsible Conduct of Research (National Health and Medical Research Council, 2018), I performed all research activities according to its principles of:

1. Honesty, rigour and accountability in the development, undertaking and reporting of research;
2. Transparency in declaring interests and reporting research methodology, data and findings;
3. Fairness in the treatment of others, especially interviewees;
4. Respect for research participants, the wider community, and the environment; and
5. Promotion of responsible research practices.

To conduct the research responsibly, I considered all potential risks to myself, the participants, the wider community and the University. The Ethics Application to the Human

Research Ethics Committee was successfully approved on 14th November 2019 and amended to cover COVID-19 safety measures on 31st March 2020.

It is the researcher's duty of care to ensure that there is a balanced consideration of the benefits against the risks of the study. No harm to research participants was expected. Nevertheless, when talking about their lived experiences with energy poverty, there was a possibility of addressing sensitive topics that could cause discomfort. A distress protocol was drawn up for such situations (Appendix 8), outlining all actions to be undertaken in case participants felt distressed or uncomfortable during the interview. The protocol included options related to changing discussion topics in case of agitation and/or terminating the interview if preferred by the participant. In case of extreme distress, or if I felt that the participant was potentially suffering from severe mental/physical risk due to their experience of energy poverty, I would also recommend the interviewee contact a counselling service (from a list curated by myself) or their current GP (general practitioner). I also planned to follow up with a call the next day to ensure the wellbeing of the participant. At all times I endeavoured to minimise risk by being respectful and considerate. Fortunately, no participant experienced distress during the course of the interview.

The distress protocol also included recommended courses of action in case I felt distressed during the interviews phase. Fortunately, no issues were experienced. Regular meetings to debrief with my supervisors and their mentoring and advice assisted me in establishing clear boundaries about the kind of assistance I could provide to interviewees as a researcher. As outlined in the participation sheet, there was no financial incentive to participate in the research. In an attempt to compensate and acknowledge interviewees for making themselves available for the interview duration, I offered to have a look at their energy bills (if they felt comfortable in doing so) and provide advice on better market offers, ways to reduce energy costs, eligibility for rebates and assistance with general and publicly available energy information sources, such as tariff types and differences in energy rates. From my personal perspective, this offer to help them in a practical way contributed to building trust with participants.

4.6 Conclusions

This chapter mapped the methodology of the study. I first revisited the research questions outlined in Chapter 1. Next, I presented and explained my ontological and epistemological perspectives, revealing my pragmatist inclination towards researching "real-world" problems in order to provide "real-world" solutions. This pragmatic disposition accords with Bourdieu's view of the ethical and moral work of the researcher in integrating theoretical and practical problem-solving intentions to the study (Bourdieu, 1999) and influences the chosen methodology. I utilised a mixed methods research approach, taking advantage of both qualitative and quantitative research methods, and obtained primary and secondary data. The qualitative and quantitative data collection and analysis procedures were detailed, so that analytical rigour and validity can be assessed. Issues around ethical considerations and the many impacts of COVID on the qualitative data collection were listed. The pioneering use of the AHCD to study energy poverty was also acknowledged. The next four chapters document the research findings of this study.

Chapter 5 The Extent of Energy Poverty among Older Australians

Introduction

In this chapter, I address the first and second research questions, i.e., to what extent do older Australians reliant on government income support suffer from energy poverty, and how might their housing conditions be contributing. As mentioned, the Australian Housing Conditions Dataset project gathered data about the housing conditions of Australians in 2016 – filling a gap since the last ABS (2000) Australian Housing Survey completed in 1999. Although the AHCD is limited in not including expenditure questions, it is the one dataset that provides the most up-to-date information on housing features, including age, size, quality, need for repair and satisfaction. No previous study of the AHCD has targeted a particularly vulnerable household group or examined energy poverty in detail, which represents an original empirical contribution. Although the AHCD is the key source of data, where appropriate other data sources were used. The key alternative sources are the Household Expenditure Survey and the Household Energy Consumption Survey (ABS, 2012a, 2016b). The quantitative findings from the AHCD sample are compared to previous studies on the subject for the purpose of assessing external validity and reliability. I also draw on the interviews to explain or expand on some of the results of the survey.

In Section 5.1, I present the results on the measurement and extent of energy poverty among older Australians focusing particularly on people reliant on the government Age Pension. In Section 5.2, I explore possible reasons for the difficulty of measuring it among this particularly vulnerable group. Drawing on the interviews I suggest that the habitus of older low-income households combined with aspects of hidden energy poverty probably results in under-representation of energy-poor older low-income households. In the subsequent sections, I discuss the connections between energy poverty indicators and other important variables in the dataset, such as housing tenure (Section 5.3), housing conditions and quality (Section 5.4), and household composition (Section 5.5). Although these variables are considered causes or contributors to energy poverty (and they are further explored as such in Chapter 6), this cross-analysis helps to explain the difference in the extent of the energy

poverty among specific groups, such as between older homeowners and older renters, or older lone person households and older couples. Lastly, this analysis suggests which groups might be more energy vulnerable within the older population group. The chapter concludes with a summary of the main findings and sets the scene for the following chapters that focus on the qualitative data findings.

5.1 Energy poverty indicators in the Australian Housing Conditions Dataset

The Housing Questionnaire used in 2016 to compile the AHCD included four questions that touched on energy poverty. Two of the questions were related to the ability to keep comfortably warm at home in winter and the ability to keep comfortably cool at home in summer, which are not covered by any other Australian national survey. The other two questions involved multiple response answers related to financial strain indicators in the 12 months prior to the survey: inability to pay electricity, gas or telephone bills on time, and inability to heat the home – which have been included in other surveys like the HILDA and HES.

Being related to the household's ability, or in the energy poverty case, their inability to cope with energy costs and thermal discomfort, these four variables are directly related to a households' economic and energy capital. Similarly, they are associated with energy-related secondary capabilities (Day et al., 2016), as explained in Chapter 3, and, therefore, included as energy poverty indicators. In the questionnaire, there was also a multiple response question on aspects of dissatisfaction with the dwelling that include the home being too cold or too hot (items 3 and 4 in question A.33 – see Appendix 1 for the questionnaire). Although not considered energy poverty indicators in this research, as they are not strongly related to household's capabilities and are profoundly dependent on many other factors (including building orientation, location, and climate - which are not investigated here), those answers were analysed and compared to the energy poverty indicators.

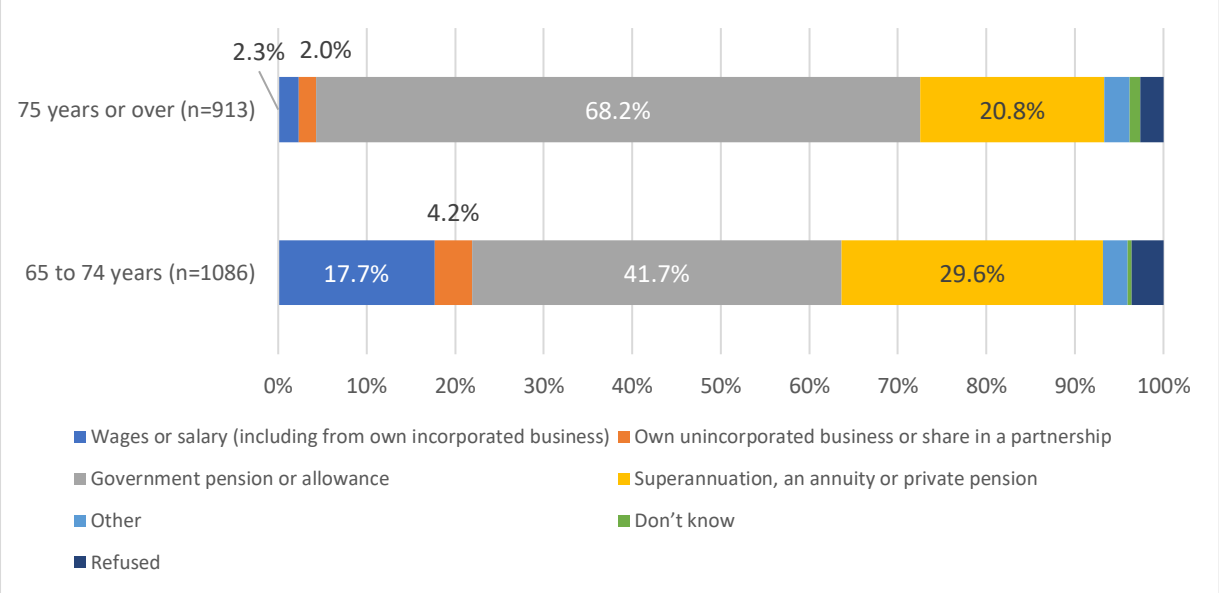
I have created an energy poverty index that combines all four indicators of energy poverty in the AHCD survey questionnaire. The questions were recoded and combined to provide evidence on households experiencing energy poverty by one or more indicators[41], analogous to the study conducted by Azpitarte et al. (2015) on the HILDA dataset.

[41] Due to the exploratory purpose of this research, the same weight (1) was given to all indicators.

5.1.1 Reliance on the government Age Pension

In the AHCD survey, most older Australians were reliant on the government Age Pension, and their reliance increased with advancing age, as seen in Figure 5.1 below. In comparison to ABS (2016b) data, in which the percentage of older Australians whose main source of income[42] was the Age Pension was 51.5% for those between 65-74 years old and 73.3% for those 75 years old and over (with relative standard error between 2.1 - 3.2%), the AHCD sample had a lower percentage on both. Almost 30% of the 65-74 years old were primarily reliant on superannuation[43], whilst this was only 21% for the 75+ years old. Over 20% of the 65-74 years old were reliant on wages, salaries, own unincorporated business or shares in a partnership, close to the 19% obtained from ABS (2016).

Figure 5.1 – Percentage of older Australians with respect to their main income source



(Source: the author using the dataset from Baker et al., 2019)

It is assumed that older (65 years old and above) Australians would earn no less than the full Age Pension which basic rate was $20,664.80 a year (around $790/fortnight) in 2016[44], but in the AHCD survey 2.2% (n=43) had an income of less than $12,000/year and 13.4% an

[42] Defined by ABS (2016b) as "the income source from which the most positive income is received. As there are several possible sources, the main source may account for less than 50% of gross income".
[43] Superannuation, or "super", is a compulsory savings scheme, started in the early 1990s, where a person has money paid by their employer to a super fund over the working life to be withdrawn, except extraordinary circumstances, only after retirement (Australian Taxation Office, 2021).
[44] The basic rate does not include pension supplements. It increased to $22,575.80 in March 2021 (Australian Government, 2021b).

income between $12,001 and $20,000 a year (n=267). Since the age a person becomes eligible for the Age Pension has increased gradually since 2019 from 65 years to 67 years old (at the time of writing in 2021 it is 66.5 years old), I had the opportunity to interview a few older women reliant on the unemployment benefit (Newstart[45]) and not the Age Pension, and their experience of energy poverty was alarming. This is elaborated on in Chapter 8.

5.1.2 Thermal comfort

According to the AHCD, 1.4% of Age Pensioners (and 1.7% of all older Australians) who experienced financial strain[46] said they were unable to heat their homes, while this was the case for 7.1% of respondents in general (and 0.9% of all survey respondents). Since the screening question significantly reduced the sample size, the comparison with other studies is compromised. In the HILDA analysis by Azpitarte et al. (2015), the number of households who reported they were unable to heat their homes between 2005 and 2011 was between 1.78% and 3.71%.

In a slightly different question, 3.9% of Age Pensioners respondents could not keep comfortably warm at home in winter, compared to 4.4% of all older Australians and the 5.7% proportion obtained from all 4501 respondents in the survey. Interestingly, only 0.8% Age Pensioners (and 1.3% of all older Australians) considered their homes too cold, which means contradictorily that even though 3.1% could not keep comfortably warm, they would not consider their homes too cold. Although there is a degree of subjectivity around thermal (dis)comfort that must be acknowledged, this might also corroborate the "cultural downplay of the discomforts of winter cold" by Australians, as Hitchings et al. (2015) studied previously. Also, in the case of Age Pensioners, many are likely to be from disadvantaged socioeconomic backgrounds, and this difference might suggest what Bourdieu (1990a) called the "sense of one's place" – the adaptation to what is feasibly achievable in terms of thermal comfort and the resignation to lower expectations.

The same happens for the inability to keep comfortably cool at home in hot summer weather, as 3.5% of Age Pensioners said they could not keep cool in summer (similar to 3.2%

[45] In 2019, the Newstart basic rate for a single person was $555.70 a fortnight. In 2020, Newstart was renamed JobSeeker and the total amount was increased by the temporary Coronavirus Supplement to $815.00 a fortnight. The supplement ended in March 2021. In October 2021, Jobseeker's single person rate was $629.50 a fortnight.
[46] Only those who answered positively to the screening question related to members of the household having experienced financial strain in the previous 12 months (Question A.42 in Appendix 1) could actually choose between the multiple response question on the financial strain indicators.

for all older Australians), but the proportion for all survey respondents was higher at 5.3%. When asked about dwelling dissatisfaction aspects, only 0.7% of Age Pensioners considered their homes too hot. It is likely that their ability to adapt to discomfort, partly due to their habitus and coping/adaptation strategies, play a part in downplaying the summer heat too. Drawing on the interviews, Chapter 8 explores this in more detail. For these two variables, there is no Australian previous study to compare, as they were benchmarked from the English Housing Survey 2013-2014 (Department for Communities and Local Government, 2015).

5.1.3 Inability to pay bills on time

Once again, only those who answered positively to the screening question related to members of the household having experienced financial strain in the previous 12 months (Question A.42 in Appendix 1) could actually respond to the inability to pay bills on time. Therefore, not all survey respondents answered this question. In this case, 74 of the 1076 Age Pensioners (about 7%) experienced financial strain and, out of those, 16.2% could not pay electricity, gas or telephone bills on time, a much smaller proportion than the 27.7% of 560 Australian respondents who experienced financial strain.

In contrast, the latest survey by COTA (2021) revealed that 16% of older Australians respondents reported having overdue bills, and the most common unpaid bills were electricity and gas. Compared to the analysis based on the HILDA data by Azpitarte et al. (2015), the number of households who reported they could not pay bills on time between 2005 and 2011 was between 8% and 11%. The Household Expenditure Survey (ABS, 2016b) later reported that 14% of Australian households in the two lowest equivalised disposable household income quintiles were unable to pay bills on time.

The difference in the proportion of households unable to pay bills on time between Age Pensioners and all respondents is not surprising, as estimates from the Household Energy Consumption Survey (ABS, 2012a) indicated that Age Pensioners have the lowest average weekly energy (electricity and gas) expenditure[47] of all households' main source of income types, including other types of government pensions and allowances, as seen in the comparative Table 5.1 below. Although the data is now 10 years old, important causal factors such as lower income, smaller household size and slower technology adoption rates (when

[47] Despite this, Chapter 8 provides more information on the many compromises and sacrifices interviewees made to be able to pay bills on time and avoid being in arrears.

compared to younger generations, as investigated by Anderson & Perrin, 2017) remain, so it is not likely that a major shift in the intervening period changed the overall comparison.

Table 5.1 - Estimates ($) on average weekly energy expenditure per households' main source of income

			Government pensions and allowances					Other income			
	Wages and salaries	Own unincorporated business income	Age pensions	Disability and carer payments	Unemployment and study payments	Family support payments	Total government pensions and allowances	Investment income	Superannuation/ annuity income	Total other income	All households
Electricity	31.87	33.93	20.23	24.17	26.13	32.28	21.99	25.90	25.50	26.23	28.98
Gas	9.92	9.03	6.80	8.41	8.56	10.05	7.23	9.69	9.51	9.52	9.16

(Source: ABS, 2012a)

These lower costs are associated with the smaller household size and smaller dwelling size, but as the interview findings demonstrate in Chapters 6 to 8, Age Pensioners' smaller bills are also due to their strict household budgeting and extreme energy conscious behaviour. They used (if owned) certain domestic appliances with less frequency to avoid extra costs (ABS, 2012b). A housing affordability survey[48] with 4,357 people across New South Wales, Queensland, and Western Australia asked participants three questions on energy use and practices to expose ways in which households sought to reduce energy usage (Cornwell et al., 2016). The findings indicated that over 60% of the low-income households surveyed frequently or occasionally restricted their use of heating or cooling, despite experiencing thermal discomfort, suggesting the underuse of energy to reduce costs and keep bills manageable.

If dividing older Australians who experienced financial strain by gender, 21% of older men could not pay bills, while only 12% of older women could not, which possibly highlights a gender difference of how energy poverty is experienced. Perhaps this can be attributed to older women being more likely than older men to have a household budget (COTA, 2018), and the malleability of older women to adopt stigmatised energy practices, so as not to fall into arrears with their energy retailers. As noted by Hards (2013), depending on one's social position and power, energy practices may be status-enhancing or stigmatising. Stigma around energy practices may arise if a person is unable to conform to the societal norms and

[48] Part of a Bankwest Curtin Economics Centre funded study.

expectations with regard to energy consumption—e.g., the "comfortable" levels of indoor heating and cooling (Hitchings & Day, 2011; Reid et al., 2015).

5.1.4 Energy poverty index

In relation to the energy poverty index[49] created, 6.5% of Age Pensioners (close to the 7% of all older Australians and smaller than the 8.9% of all survey respondents) were considered in energy poverty by one indicator and around 1% were in energy poverty by 2 indicators, equalling 7.5% of Age Pensioners in energy poverty, as seen in the Table 5.2 below. These results are consistent with Nance's (2013), in which between 2% and 14% of Australian households experience energy poverty depending on the type of measurement adopted. As those are self-assessed indicators, most Age Pensioners (92%) did not consider themselves in energy poverty.

Table 5.2 - Energy poverty index among Australian Age Pensioners

	Frequency	Percent (%)
Not in energy poverty	995	92.5
In energy poverty by 1 indicator	70	6.5
In energy poverty by 2 indicators	10	0.9
In energy poverty by 3 indicators	1	0.1
Total	1076	100

(Source: the author using the dataset from Baker et al., 2019)

If considering all AHCD survey respondents, the percentage of Australians living in energy poverty by at least one indicator is 11.6%. The AHCD findings might sound like an under-estimation if one tries to compare it to previous studies such as the one conducted by Azpitarte et al. (2015) where five indicators of energy poverty revealed that 29% of Australian households are considered in energy poverty by at least one indicator. However, there are significant differences in the studies that need to be noted. Firstly, these are two different datasets, so no direct comparison is possible. Secondly, the metrics used are distinct: three of the five indicators in Azpitarte et al.'s (2015) study are income-expenditure calculations, based on energy costs and income provided by survey respondents. No income-expenditure indicators could be analysed using the AHCD dataset, so this comparison is not valid.

[49] As described in page 99, the four indicators combined in the index are: inability to keep comfortably warm at home in winter, inability to keep comfortably cool at home in summer, inability to pay electricity, gas or telephone bills on time and inability to heat the home.

Recent studies, like the one conducted by Churchill and Smyth (2021), also revealed how different indicators and methodologies point to different proportions of the sample being in energy poverty, as highlighted in Chapter 2. In their analysis of the HILDA dataset, an objective indicator based on the LIHC measure resulted in 5.4% of Australian households facing energy poverty; and a subjective indicator of energy poverty related to the inability to heat the home suggested only 2.9% of Australian households experience energy poverty – much lower percentages when compared to the ones obtained by Azpitarte et al. (2015).

Such enormous variations between metrics are not uncommon, considering that different datasets, indicators, and methodological procedures provide results with different proportions and groups of the population subjected to energy poverty. Moreover, it also depends on the definition of energy poverty adopted (Culver, 2017) and whether focus (and weight) is given on objective or subjective measures. Whatever the focus, measuring energy poverty remains a challenging task, not only because it depends on the availability of data and resources for empirical research, but also because it is a "private condition, being confined to the home, it varies over time and by place, and it […] is culturally sensitive" (Anagnostopoulos et al., 2016, p. 103). In regard to the subjectivity of the cultural aspect, importance must be given to the habitus (as in dispositions, experiences and attitudes) of energy-poor households and how this may hamper the measurement of the real extent of energy poverty.

5.2 The difficulty of measuring energy poverty among older Australians – The habitus factor and hidden energy poverty

Besides the overall challenge of getting an accurate measure of energy poverty at a national scale, as discussed above, it seems that among older Australians there is a strong component of hidden energy poverty. Meyer et al. (2018, p. 276) have the following definition of hidden energy poverty: "the household has energy expenditures that are assessed to be too low compared to a decent standard of living ([considering] energy expenditures of similar households: same composition, same dwelling size)". It is "hidden", in their view, because the very low energy expenditure is not captured by common energy poverty objective measures that aim to identify households with excessive energy bills compared to disposable income. In Australia, for example, studies indicate that the biggest cohort of energy poor or energy

vulnerable households are usually large low-income families or single parent families (Judson et al., 2019; KPMG, 2017; Nelson et al., 2019).

Therefore, energy poverty statistics may be under-estimated for those vulnerable "low energy use" groups. I not only agree that there is a hidden energy poverty issue among older low-income Australians but I argue that, for Age Pensioners, this is usually the norm. Their efforts to restrict their energy consumption below basic energy needs to keep bills low, means that most do not have problems with paying the energy bills on time and have not needed to enter a hardship program. This reduces their numbers on national statistics, resulting in them going unnoticed (VCOSS, 2018). The in-depth interviews revealed the disclosure of those hidden aspects (see Section 8.4).

There is another important discussion about hidden energy poverty. In this scenario the household does not view itself as energy poor, despite their lived experience pointing otherwise. This hinders identification through consensual measure approaches. Recognising energy poverty was easier for households who had payment difficulties or had to approach charities. The interviews illustrated that many of the interviewees who were able to pay their bills on time restricted their energy usage. However, they did not mention that their primary motivation to have a "low-energy-usage-life" was because of energy poverty. Rather their low usage was a function of their habitus: the habits, behaviours and dispositions they acquired when growing up and which they had retained all their lives. Their habitus internalised the externalities associated with their deprived capital and lower socioeconomic position in the social field (Bourdieu, 1977). As Phoebe (71 years old, homeowner[50]) revealed, even though she avoided using heating and cooling devices, she did not see herself as restricting energy consumption:

> *I've never been particularly interested in the newest gadget or the newest thing that's out, that's going to make your life easier. So, I don't, I haven't really needed to restrict things much, probably because my lifestyle is fairly simple… I think that, you know, that frugal[ity], you know. I've never been one to thinking of spending a lot of money… So, my lifestyle is not … an expensive lifestyle. It never has been I suppose.*

Over half of the interviewees were fine with temperatures that are commonly viewed as unacceptable and uncomfortable, disclosing the subjectivity of thermal comfort, another

[50] Every time an interviewee is mentioned for the first time in this document, I give a brief profile on age and housing tenure status. A full profile of all interviewees can be found in pages 80 and 81 (Table 4.2).

issue on consensual indicators of energy poverty. Anthony (69 years old, homeowner), who lived in regional NSW, commented: "[It is] a little bit uncomfortable, but not extreme, because we don't get over about 40 degrees. So, you know, is 40 degrees comfortable? It's very subjective".

The vast majority of interviewees described themselves as "War Babies", and their extreme caution with energy use was just one of the many frugal attitudes they had towards life in general after the Great Depression and World War II (Waitt et al., 2016; Witkowski, 2010). They reported living frugally since childhood or having a difficult upbringing pervaded by scarcity. Adapting to and the acceptance of frugality was a necessity and normalised (Bourdieu, 1984). In most cases, as identified by Connon (2018), this comes with a sense of pride in being able to live frugally. The excerpts below illustrate how being a war child shaped their identity, upbringing, current lifestyle and, ultimately, their energy practices.

> *That's the only way I survived, what I've done … So those things [frugal practices] were just part of our life at that time. And at the farm they didn't have electricity. Kerosene fridges… I was sort of like a war child. (Samantha, 77 years old, social housing tenant)*

> *Yes, I am very frugal. Yes, I must admit that… You know, also don't forget, I'm a war baby, right. I was born during the war. And we had to be very frugal with everything. We had to [have]—even now I've got—cupboards full of all sorts of bits of paper, elastic bands, pots with lids on. I always think that will be useful, we can use that… All that still hasn't let me down. We did have to struggle, and we had to make do. And if you didn't have what you had, you had to find something else to do it with (Denise, 77 years old, social housing tenant)*

Adapting to or making do with whatever life presented them was a recurrent theme. Besides their class position shaping their habitus, it could be argued this common ground around the "War Baby" self-identification reflects a "generational habitus", a concept defined by Gilleard (2004, p. 114) when applying Bourdieu's ideas of habitus and field into generation theory (Mannheim, 1970): "[the] dispositions that generate and structure individual practices and which emerge and are defined by the forces operating in a particular generational field", in which "changed relationships between past and present social spaces" emerge. The interviews indicate that the disruptive and traumatic war period shaped their culture, their social practices and "provided them with a collective memory" (Eyerman & Turner, 1998, p. 91) that influenced their attitudes and behaviours.

The majority of interviewees belonged either to the Silent Generation (born 1928 to 1945) or the Baby Boomers Generation (born 1946 to 1964), and felt proud in adapting to, or coping in alternative ways with the thermal discomfort at home and adopting a lower energy use lifestyle to keep bills manageable without asking for help from others. In many ways their frugal upbringing prepared them well for difficult times, as Violet (67 years old, social housing tenant) acknowledges below:

> *Psychologically, we know how to watch our money. I think us older ones know better because we've gone through, some of us have gone through world wars and what have you, so we have seen more than we ever want to see. They have gone through hell and back, as they've said. Some of us, we are going through hell and back.*

The "tyranny of thrift" (see Waitt et al., 2016) was ingrained in their lifestyle – in some cases by choice, and, in others, by necessity – and enabled them to negotiate energy practices without feeling stigmatised, as this was already something in the habitus shaped by their class origins and upbringing. The excerpts below show how the habitus of the interviewees shaped their current energy practices and capacity to adapt. Samantha, for example, grew up in a cold home, so experiencing thermal discomfort was familiar to her.

> *[In my childhood home], we had a wood stove and wood heating in the house. It was cold. We used to freeze at night at worst. But it was up to us to make sure that we were comfortable. I think that's where I'm lucky that I can adapt. I don't need the air conditioners.*

Another interviewee, Anna (51 years old, private renter), spoke about how her mother also suffered from energy poverty, suggesting an intergenerational aspect related to the family's socioeconomic background. Energy practices are "cultivated, transmitted and enhanced in contexts of family practices and intimacies" (Silva, 2005, p. 100). The familiarity of frugal energy practices is also enhanced by the surrounding community. Bourdieu (1985, p. 725) said that those "being placed in similar conditions and subjected to similar conditionings, have every likelihood of having similar dispositions […] and therefore of producing similar practices and adopting similar stances". To account for that, Bill (70 years old, social housing tenant) made a point that the adaptation efforts towards colder or warmer temperatures were shared among the people he grew up with, highlighting the commonality of the lived experience of people of similar socioeconomic backgrounds (Dillon, 2019):

Well, the older people I've grown up… And I could say most of us [Age Pensioners] now… I remember we had a "cold and cape" fight. The cold will come around and make you cold … So I think we adapt. Adapt to the conditions and try to be comfortable. Of course, naturally, there are the times you feel cold and then it's a bit uncomfortable… with the heat too... especially if you are in a house that traps the heat in, but we adapt.

There is a generational and cultural factor among older households that contribute to the hidden energy poverty they fail to recognise. Furthermore, it was difficult not to spot the narratives that framed their energy practices and how they would contrast themselves to the current "society values" of "instant gratification" and "wasteful consumption" and the younger generations energy use. Samantha had a strong opinion about how the young generation is educated nowadays and the overuse of energy:

[In my childhood], we had to do the work … We had to cut the wood to make the fire go. I've been thinking about that in terms of the children being educated on their computers. And how different it was … The old men have been trained not to over use electricity. Younger people overuse it.

A similar thought was shared by Phoebe, who realised how different her energy needs and practices were compared to her younger niece:

I really often go quite a long while into summer without even getting it [the portable fan] out. So, I think it's just that, you know. It's almost like, in a way, you just put up with things until it gets really bad. Whereas my niece will put on her air conditioning right from the start of summer. And she makes sure that she has got the air conditioning right though the house. Whereas that just wouldn't occur to me.

Janine (64 years old, social housing tenant) highlights the issues of the "impulse society" (see Roberts, 2014). While she could easily go without certain things, including her thermal comfort, to make ends meet, she was critical of what she perceived to be the instant gratification needs and "sense of entitlement" (as seen in Day and Hitchings, 2009) of younger generations:

I have never been one to live beyond my means, you know. And I know a lot of people are doing that. It's just the society we live in. You know, we live in a society where people want instant gratification. And they sort of want everything done yesterday. And they have to have all the bells and whistles, you know. All the knickknacks that are going. Whereas I can quite easily go without those things. … So that's why I just make sure that I pay it [the energy bill] on time. And like I said, you find money for other things afterwards, you know. Or you go without. You can do without certain things

Denise also mentioned about how energy practices and needs have changed in recent years. While her generation faced the first decades of mass electrification, those born after 2000, in the digital era, usually take it for granted.

> *It's no disrespect to young people. I don't mean it that way… But if you're born in 2000, you wouldn't even think about [being frugal about energy use]. You just don't care.*

Due to the way in which interviewees' socioeconomic context and habitus resulted in their "low-energy use" life, the majority could be classified as "inadvertent environmentalists" (see Hitchings et al., 2015). In eight interviews, however, strong environmental and moral values towards consumption—combined with the energy costs—would influence households' energy practices and their behaviour at home to the point of accentuating energy poverty. Interestingly, this is also a hidden form of energy poverty (Meyer et al., 2018). This corroborates studies on the low-consumption chosen lifestyles by those who consider themselves activists (Alexander & Ussher, 2012; Demetry et al., 2015).

> *I try to keep my usage down anyway, the less I use, the less coal comes out of the ground - in theory. (Anna)*

Samantha was an extreme case of how her environmental concern over her carbon footprint pushed her into living in energy poverty. When she was moved from her social housing home in Miller's Point to a social housing unit in Annandale, the new dwelling had no supply of gas, and she was outraged by the storage water heater available at the property and the incapacity to heat her home with gas. She even stopped using hot water for her pain management treatment.

> *I don't heat the house. And that's combined with both principals [reduce energy costs and environmental damage] because I know that what I'm consuming can't ever be replaced environmentally. And I don't think there's any [electric] energy efficient heating that I could put into this environment. Does that make sense? As an environmentalist, I have really tried for, since the 70s, since I've been an adult to reduce [consumption]. Have a good environmental footprint is the expression now. For that reason, I have gravitated towards not buying electrical equipment, disposable equipment, a lot of that sort of thing. It's just been a lifestyle choice that I've made in not requiring those things.*

Their habitus and environmental concern were also reflected in their opinion about contemporary technology and even common appliances such as air conditioners. Bill and Gloria (70 years old, social housing tenant) thought there was no need to install air conditioners in homes and worried how this could overload the energy grid:

Bill: What we've noticed also, because a lot of these [public housing] properties have been sold [by the government] … and we see the DAs [development applications], the plannings come out… and what we find out is that the homes that we lived in… which were cold in the cold and very hot in summer… The people that bought, they are installing, in a block full of units, they are installing an air conditioner [AC] in each unit.
Gloria: Nearly every place has got an air conditioner now.
Bill: And this is something that we never had… and we never even wanted to have. So I wonder that in the future… something is gonna happen. The grid won't handle [it] you know… If everyone turns on their AC, it's gonna go over the grid.

The excerpts point to the following conclusion: many older Australians on low incomes have struggled their entire lives and the values of frugality and being silent (not to complain) of their generation and family dispositions shape their energy practices and their lived experience of energy poverty. Mostly, they know no other way to cope with high energy costs besides limiting their usage and adapting to the situation (Sherriff et al., 2019). By being resilient and adapting to energy poverty as best as they can, they do not recognise the problem or have the capital to escape or react to this condition in other ways.

Current survey instruments fail to account for these nuances of energy poverty among older Australians. The interviews, as illustrated, strongly suggest that the extent of energy poverty measured in surveys in Australia underestimates the existing reality and can be misleading in terms of policy making and advocacy, as signalled by VCOSS (2018). Hidden energy poverty as revealed in other countries (Eisfeld & Seebauer, 2020; Karpinska & Śmiech, 2020; Meyer et al., 2018; Sareen et al., 2020) is clearly also a significant issue in Australia. Existing measures of energy poverty still fail to identify with precision the most vulnerable energy-poor older households, potentially because of issues related to their permanent deprivation status, their habitus and cultural capital.

5.3 Energy poverty and housing tenure

5.3.1 Older Australians, housing tenure, and affordability of housing costs

This section draws on the AHCD data. In the AHCD, the majority of older Australians were homeowners, either outright (83%) or with a mortgage (6.5%). Housing tenure varied according to household composition, with 15% of older lone households living in rented homes, as opposed to 3.8% of couples with no children.

For the 164 older Australians (8.2% of total) who were living in rented dwellings, 27.4% rented their homes from a real estate agent and 21.3% rented from another person not in the

same household (e.g., directly with the landlord). The majority of older Australians in this survey (44.5%) rented their homes from a state or territory housing authority (government provided social housing with a subsidised rent). The waiting list for public or social housing is long (166,000 households on the list according to Australian Institute of Health and Welfare, 2021), and eligibility is interrelated with many vulnerability issues (including risk of homelessness and life or safety threats in existing accommodation). Noteworthy is that older social housing tenants in Australia have a rent cap on 25% maximum of their income, as opposed to private renters, who must pay a market rate. This results in significant disparities in disposable income after housing costs between social housing tenants and private renters, with major implications on their quality of life and wellbeing (Morris, 2016).

Housing tenure among older Australians varied considerably according to main source of income. The vast majority of older renters (82%) were reliant on the government Age Pension. From the proportion of Age Pensioners respondents (12.5%) renting their home, 56% lived in social housing and 44% were dependent on the private rental market. Likewise, and directly associated with the main source of income, the lower the income level the more likely older Australians were to be renters. While for those on middle and higher incomes (above $60,000 annual gross income per household) renting comprised only 2% to 5% of the respondents, in the lower incomes (below $40,000 annual gross income per household) the proportion was much higher between 8% and 21%. Housing tenure is significant. Besides having higher housing costs, renters have minimal or no agency over a rented place. The systems and appliances in rented properties are common issues among energy-poor households (ACOSS, 2019b; Liu et al., 2019).

When it comes to the self-assessed affordability of housing costs, although the majority of the older respondents to the AHCD survey could afford their housing costs with no major issues (as most were homeowners), Age Pensioners had a larger proportion of respondents struggling to afford their housing costs. Nearly a quarter of Age Pensioners did not feel their housing costs were completely affordable. About 5% of all older Australians did not know how to assess the affordability of their housing costs, which may imply low financial literacy (as identified in Lowies et al., 2019; Xue et al., 2019) and budgeting skills that also affect their capabilities of managing energy bills.

Because of greater housing costs, older renters also had more reservations and issues around housing affordability; a quarter of older renters could not completely afford their

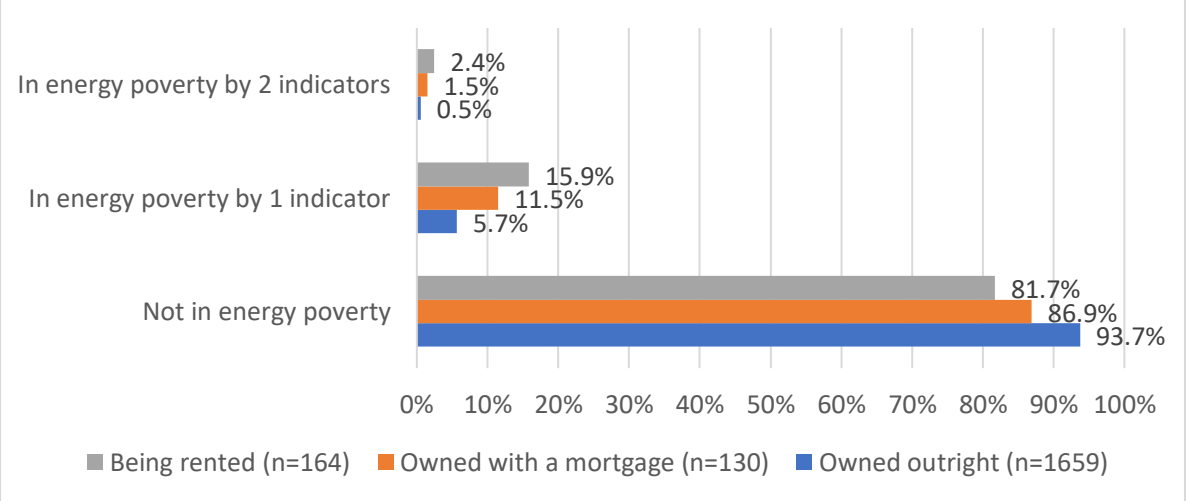
housing costs, while this was the case for only 15% of homeowners (with mortgage). If separating between public and private renters, 36% of older private renters had issues with housing costs compared to 29% of public renters. For those who already struggle with their housing costs, particularly private renters, energy costs can be a major burden and drain on their income (Morris, 2016; Morris et al., 2021).

5.3.2 Association between energy poverty and housing tenure

Corroborating previous studies (Azpitarte et al., 2015; EWON NSW, 2021a; Nance, 2013), the analysis of the AHCD indicates an association between older Australians' housing tenure (and therefore housing costs and disposable income) and their inability to keep warm at home. One in ten older renters were unable to keep comfortably warm in winter, as opposed to only 4% of older outright homeowners. Similar results were found between housing tenure and the inability to keep cool at home, as 8% of older renters were unable to cool their homes, as opposed to only 3% of older outright homeowners.

There is a statistically significant association (contingency coefficient, r=0.141, ρ=0.000) between the housing tenure and the experience of energy poverty (Figure 5.2). The data analysis further revealed that 1 in 4 older private renters experienced energy poverty by 1 indicator as opposed to 14% of renters from a state housing authority. Even though, according to Cornwell et al. (2016), households living in public/social rented homes have the lowest energy expenditure across Australia, it is still noteworthy that one in seven older public/social renters had to deal with energy poverty.

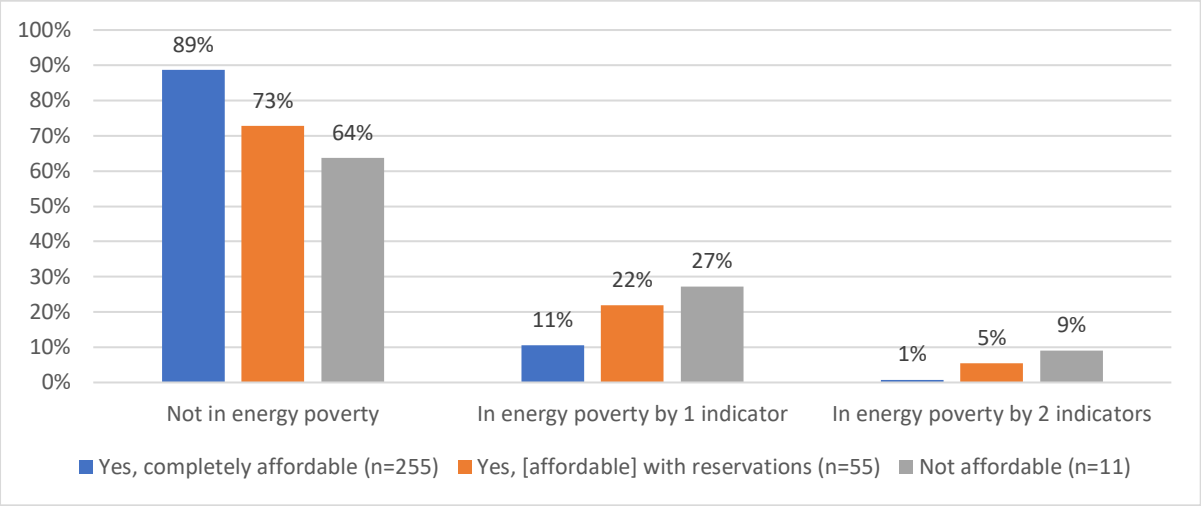
Figure 5.2 - Energy poverty index by housing tenure



(Source: the author using the dataset from Baker et al., 2019)

Lastly, their assessment of the affordability of housing costs indicates an association with the overall experience of energy poverty (Figure 5.3). The more unaffordable their housing costs, especially for private renters, the more they were suffering from energy poverty by one or more indicators. This corroborates the low disposable income factor, i.e., the low economic capital, as a major cause of energy poverty (KPMG, 2017; Nelson et al., 2019).

Figure 5.3 - Energy poverty index and affordability of housing costs



(Source: the author using the dataset from Baker et al., 2019)

5.4 Energy poverty and the condition of the housing

5.4.1 Older Australians and their housing conditions

Dwelling type, size and age

The majority of older Australians surveyed lived in freestanding houses irrespective of their source of income. However, the downsizing movement at an older age (Judd et al., 2014) has meant an increasing proportion of older Australians (9%) are living in apartments. Furthermore, for those reliant on the government Age Pension, 13% lived in semi-detached homes and 10% lived in apartments. The size of the homes also varied according to the source of income, and research conducted by Romanach et al. (2017) has shown that the number of bedrooms influences energy consumption among older Australians. Older Australians reliant on the Age Pension for their income generally lived in smaller homes (between 1 and 3 bedrooms), while those reliant on wages and superannuation lived in considerably bigger homes (between 3 and 5 bedrooms). This reflects the significant difference in wealth

(economic capital) between Age Pensioners and self-funded retirees, which further reflects on the lower overall energy expenditure of Age Pensioners detailed in Table 5.1.

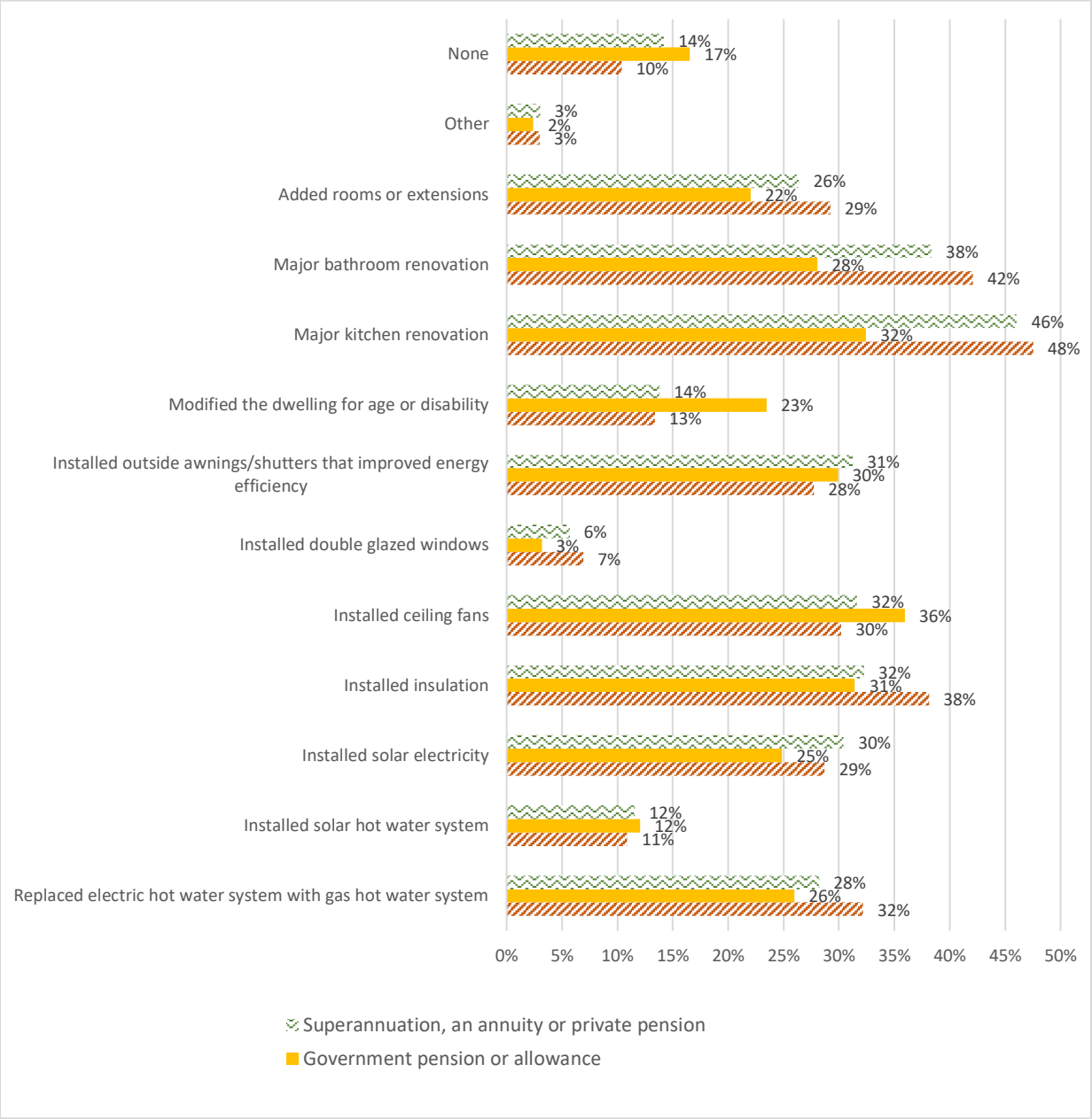
Nine in ten older Australians lived in homes built before the first housing provisions for minimum energy efficiency requirements were established in 2003 (Berry & Marker, 2015). Moreover, approximately two thirds of older Australians lived in homes older than 30 years, irrespective of their main source of income. Even for those Age Pensioners who own their homes (asset-rich/income-poor), living in older dwellings may push vulnerable households into energy poverty, particularly those on lower incomes who struggle to make ends meet and cannot afford to improve the energy efficiency of the dwelling by themselves (see Chester, 2013).

Need for repairs and dwelling modifications

Despite living in older homes for extended periods of time, the majority (51%) of people reliant on the Age Pension did not consider there was a need for repairs, possibly because they failed to notice the deterioration or accepted it, due to their limited economic capital and if a renter, an inability to change their circumstance. There might also be the case that their lower expectations and aspirations (compared to higher socio-economic backgrounds, as documented by Dominy and Kempson, 2006) shaped by their habitus influenced their perception of repair needed. Approximately one third of Age Pensioners reported a desirable but low repair need and about 17% believed there was a moderate to essential urgent need for repair.

For those who owned their homes (either outright or paying a mortgage), dwelling modifications are presented next (Figure 5.4). A large proportion of older households have embarked on dwelling modifications and many of them can be attributed to energy efficiency features or better thermal comfort, such as insulation, solar power, gas hot water system and ceiling fans. However, it is likely that Age Pensioners were less able to undertake more expensive or major modifications when compared to the other groups, such as installation of double-glazed windows or kitchen and bathroom renovations.

Figure 5.4 - Dwelling modification in homes bought by older Australians

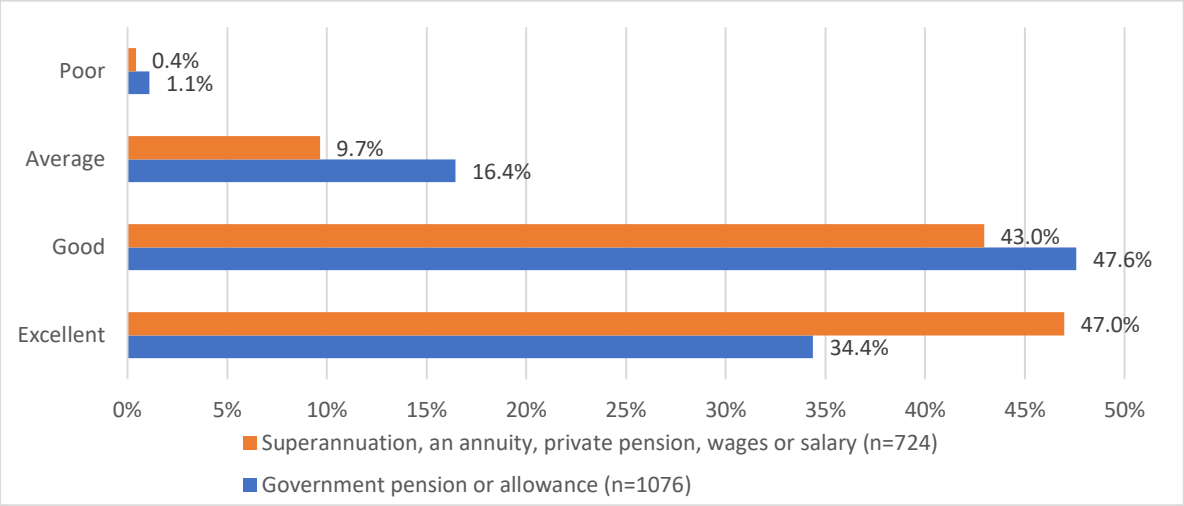


(Source: the author using the dataset from Baker et al., 2019)

Quality and satisfaction with the home

For their self-assessed overall physical quality of the dwelling, most older Australians considered their homes either excellent or good, irrespective of source of income. Nevertheless, it is worth noticing in Figure 5.5 that respondents reliant on the Age Pension for their income had a less positive assessment of their homes when compared to self-funded retirees and those reliant on wages and salaries. Only 1% (n=14) of Age Pensioners assessed their homes as of poor or very poor quality.

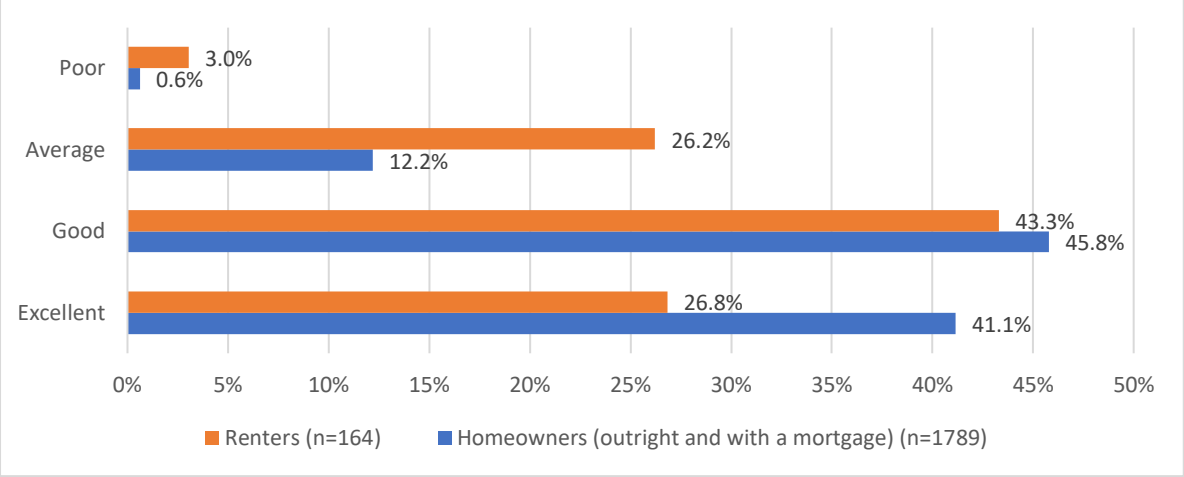
Figure 5.5 - Older Australians' self-assessed quality of dwelling



(Source: the author using the dataset from Baker et al., 2019)

Older renters (n=164) considered the quality of their homes less positively than older homeowners (n=1659 for owners outright and n=130 for owners with a mortgage combined). Over one in four (26%) renters reported the quality of their dwelling was average compared to around 12% of homeowners (Figure 5.6). Possibly because of the greater need for repairs and inferior self-assessed quality of their homes, renters[51] were not as satisfied as homeowners with their dwellings, although overall, they were mostly satisfied – only 3% reported being neutral or dissatisfied with their homes.

Figure 5.6 - Self-assessed quality of dwelling by housing tenure



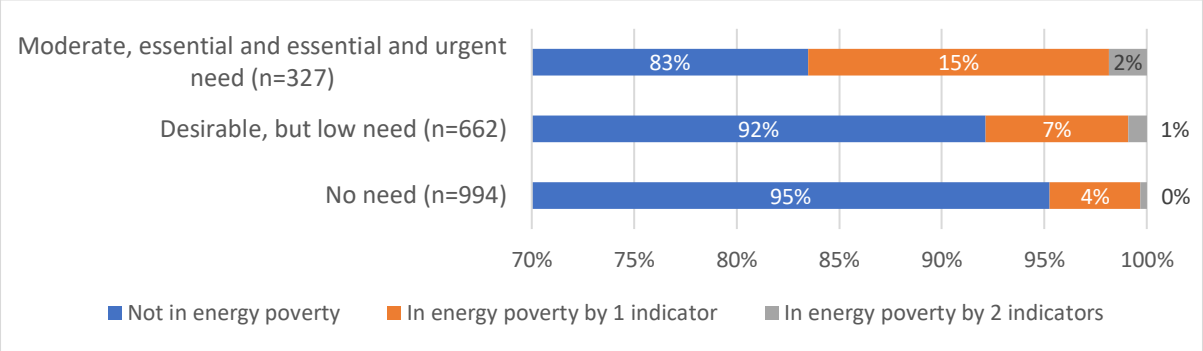
(Source: the author using the dataset from Baker et al., 2019)

[51] I checked for significant differences in regards to self-assessed quality of dwelling between private renters and social housing tenants. Results do not change much, and sample size reduces significantly (45 private renters and 73 social housing tenants), compromising statistical significance.

5.4.2 Association between energy poverty and housing conditions

There is a significant association (Spearman correlation, r=0.143, ρ=0.000) between the energy poverty index and the need for repairs. Those with moderate to essential and urgent repair needs experienced energy poverty by one or more indicators in a greater proportion than those with no need of repairs, as seen in Figure 5.7[52].

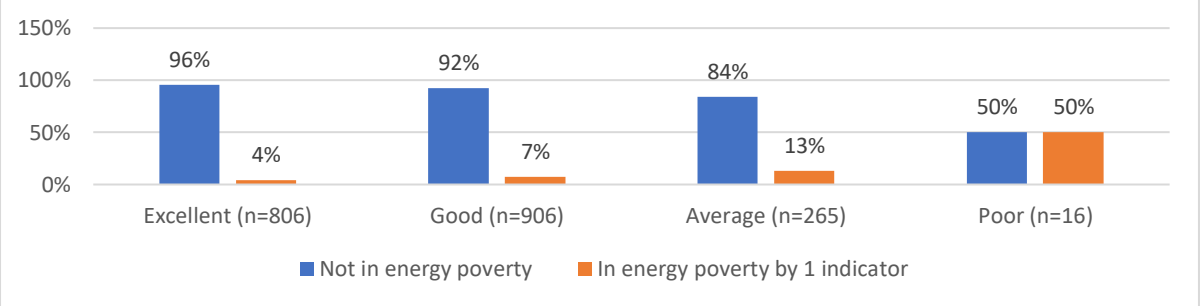
Figure 5.7 - Energy poverty index and the need for repairs



(Source: the author using the dataset from Baker et al., 2019)

There is also a small (but statistically significant) association between the older Australians' self-assessed quality of the dwelling (Spearman correlation, r=0.146, ρ=0.000), their satisfaction with the dwelling (Spearman correlation, r=0.168, ρ=0.000) and the energy poverty index, as the poorer they assessed the quality and the less satisfied they were with their homes, the more likely the older household was to experience energy poverty by at least one indicator – as seen in Figure 5.8. It is worth mentioning that only 16 older Australians considered their homes of poor quality, hence the steady increase in the proportion of the index with this group.

Figure 5.8 - Energy poverty index and self-assessed quality of dwelling



(Source: the author using the dataset from Baker et al., 2019)

[52] In the graph, the three categories of moderate repairs needs, essential repair needs, and essential and urgent repair needs have been amalgamated.

5.5 Energy poverty and household composition

5.5.1 The household composition of older Australians

As seen in Table 5.3, 68% of homes rented by older respondents were lone person households. Nearly half of owned homes (either outright or with a mortgage) belonged to couples with no children living in the parental home (nearly half).

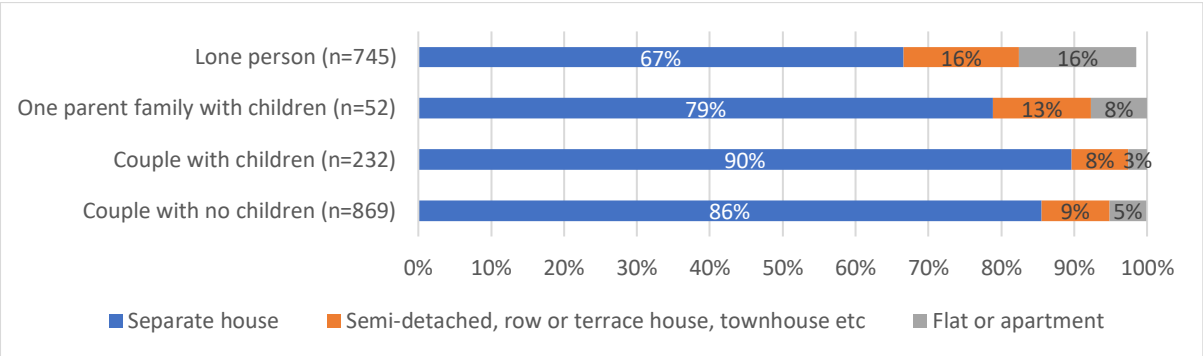
Table 5.3 - Housing tenure by older Australians' household composition (n=1857)

		Couple with no children (n=857)	Couple with children (n=232)	One parent family with children (n=52)	Lone person (n=716)
Owned outright	n=	766	197	43	574
	%	46%	12%	3%	35%
Owned with a mortgage	n=	58	27	4	30
	%	45%	21%	3%	23%
Being rented	n=	33	8	5	112
	%	20%	5%	3%	68%

(Source: the author using the dataset from Baker et al., 2019)

Most older households, irrespective of their household composition, lived in separate houses, but lone older households were more likely than other groups to be living in smaller dwellings, such as semi-detached and apartments (as seen in Figure 5.9) with fewer bedrooms than couples' households. The smaller dwelling and household size has an effect on their energy consumption; lone person households 65 years old and over have one of the lowest average weekly energy expenditure of all household composition structures (ABS, 2016b).

Figure 5.9 - Dwelling type by household composition of older Australians



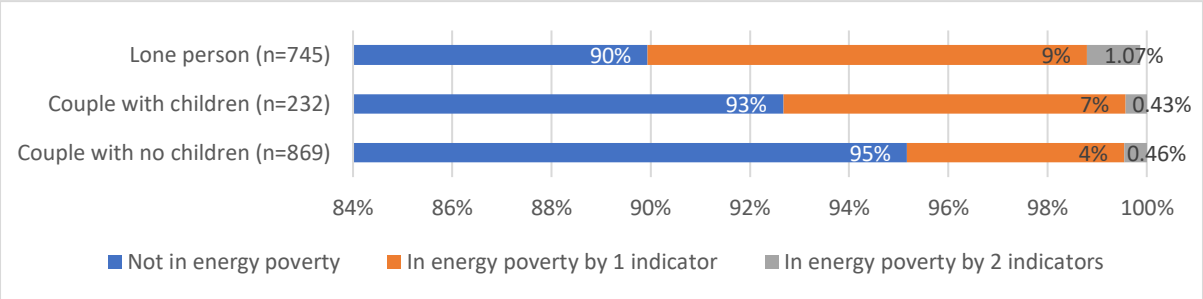
(Source: the author using the dataset from Baker et al., 2019)

5.5.2 Association between energy poverty and household composition

The inability to keep warm in winter or keep cool in summer at home differs with the household composition. Although still small, the proportion of older lone person households

that could not keep themselves comfortable in winter and summer (around 6%) was almost double the percentage of couples. There is also an association (contingency coefficient, r=0.125, ρ=0.024) between the overall experience of energy poverty (by one or more indicators) and the household composition, as seen below in Figure 5.10. More older lone person households suffered from energy poverty than other older household groups, which is an interesting finding since some previous studies (KPMG, 2017; Nelson et al., 2019) indicated that, in general, larger household sizes are more likely to be affected by energy poverty due to increased energy use. In the case of older households, however, single Age Pensioners invariably have far less income than older couples on the Age Pension[53]. Additionally, fixed energy supply charges, which can represent about half of the total energy bill, remain the same irrespective of household size.

Figure 5.10 - Energy poverty index by household composition



(Source: the author using the dataset from Baker et al., 2019)

5.6 Conclusions

This chapter, drawing primarily on the AHCD survey fielded in 2016 and the in-depth interviews, investigated to what extent older Australians, and particularly those reliant on the Age Pension, suffer from energy poverty, and how their housing conditions might be contributing to that end. The analysis also mapped which older household groups might be more vulnerable to energy poverty.

To understand how their housing conditions influence the experience of energy poverty is not an easy task in quantitative research, as there are many external factors and potential variables to consider. However, in this exploratory study, important correlations were identified. The data indicated that 7.5% of Australian Age Pensioners experienced energy

[53] Currently, couples on the Age Pension receive about $1436 a fortnight and singles receive around $952.

poverty by at least one indicator. Additionally, older low-income households, private renters, lone person households, and households living in poorer quality homes in need for repairs are more likely to experience energy poverty. As the quantitative study conducted focused on potential associations within bivariate analysis only, it is important to note that these variables are very likely to be associated with each other as well. Therefore, it is not possible to say which of them have the strongest explanatory power. Furthermore, causal relations between the variables have not been established, and may be pursued in future research.

Comparing studies on the extent of energy poverty is complex due to different methodologies and indicators being applied. As mentioned, previous studies suggest a range of 2% to 29% of Australian households in energy poverty (Azpitarte et al., 2015; Churchill & Smyth, 2021; Nance, 2013; VCOSS, 2018), which clearly highlights the differences obtained by using different measures. An important question, however, is whether national surveys in Australia, including the AHCD questionnaire, accurately measure energy poverty among households, especially the vulnerable ones mentioned previously, who may suffer from hidden energy poverty (Meyer et al., 2018). The AHCD questions related to energy poverty unfortunately only address thermal discomfort and subjective measures of financial hardship. The same applies to the HILDA survey questionnaire, although it also encompasses income-expenditure variables for objective measures of financial hardship.

In addition, a discussion on the hidden energy poverty aspects among this vulnerable group of households, drawing on Bourdieu's concept of habitus (in terms of knowledge, skills, behaviours, and education towards energy-related subjects), revealed generational and cultural factors that shape their frugal behaviours and pride in adapting to necessity. Such subjective factors may influence how older households perceive their situation (if they fail to recognise themselves as energy poor, they may miss the opportunity of getting proper assistance) and also mislead results in large-scale surveys, making it more challenging not only for researchers, but also governments and policy makers to adequately identify energy-poor households.

As previous research (Chester, 2013; Judson et al., 2019; Willand & Horne, 2018) has demonstrated, energy poverty is experienced in a myriad of ways, such as showering or cooking less to reduce energy costs or developing adapting behaviours in other aspects of household's life, like cutting down on food consumption or social activities to manage all bills. Limiting current quantitative measures of energy poverty to thermal discomfort and inability

to pay bills on time is a narrow understanding of the issue and excludes those who choose to compromise their quality of life in other ways.

While more than half of older Australians feel that the rising cost of living is leaving them behind (COTA, 2018) – and low incomes and high energy prices are major causes of energy poverty –, it is still unclear which factors influence the unaffordability of energy costs. How does the liberalised market (i.e., the energy field) influence their experience of energy poverty? How do other capabilities, such as computer and energy literacy (related to their cultural capital) affect a person's ability to engage with the energy market? The next two chapters will focus on the causes of energy poverty among older Australians. The qualitative findings presented in the following chapters examine and detail how energy poverty is experienced by older low-income households and how their homes influence their decisions and energy practices.

Chapter 6 The Causes of Energy Poverty among Older Australians - Part 1: Economic Capital-related Factors

Introduction

Seminal research by Boardman (1991) pointed to the triad of poor housing conditions, low incomes and high energy prices as the major causes of energy poverty – all of which are related to low levels of economic capital. This chapter, drawing primarily on the in-depth interviews, discusses the many energy poverty drivers related to low levels of economic capital among older Australians. Firstly, in Section 6.1, I explore the low-income context and how low energy capital is only a piece of the puzzle in the myriad of poverty and deprivation issues faced by Age Pensioners, including a section on extraordinary expenses that affect their budget capabilities. Since housing tenure and, therefore, housing costs considerably affect disposable income, this section also includes a discussion on the dire situation of older private renters.

Continuing the discussion on economic and energy capital related to the dwelling, Section 6.2 adds to the quantitative findings discussed in Chapter 5 by exposing the energy-poor households' understanding of how their home conditions affect their energy consumption and experience of energy poverty. Issues related to the poor energy efficiency of dwellings, their heating and cooling systems, the domestic appliances, and how the lack of knowledge about these systems can impact on energy costs is mapped out. Another issue is the modern trend of open plan homes and how this design feature compromises energy saving strategies and what I call the "localised thermal comfort", as opposed to the entire room (or rooms) thermal comfort. Despite not having many interviewees in the private rental market, notable findings on the difference between the level of energy poverty experienced by private renters and social housing renters and homeowners, and the lack of agency of tenants with respect to the energy efficiency of their home is discussed.

Section 6.3 addresses the issue of high energy costs and the underlying causes of it, such as high supply charges (particularly in regional areas), issues with faulty meters, overestimated bills, unusual charges for paper bills and security deposits, and concessions and rebates not being applied. Consequently, the exchange transaction between economic capital and energy capital is inefficient, and Age Pensioners end up paying more for a lesser amount

of energy that is frequently not sufficient for their needs. An inefficient economic-energy capital transaction further reduces Age Pensioners' disposable income, impacting their quality of life in other aspects, as discussed in Chapter 8. The chapter concludes with a brief summary of findings. It is complemented by Chapter 7, that focuses on other capital-related contributors to energy poverty. Whilst dividing the study findings around the understandings, dimensions and perspectives on causes of energy poverty in two chapters for thesis structure and readability, it is important to note that a composite view of how these contributing factors coincide, interact and amplify each other is needed in order to provide a comprehensive understanding of energy poverty amongst older Australians.

6.1 Low-income and energy poverty

According to the 2020 HILDA report, relative poverty rates[54] are consistently higher among older people, particularly older single people, ranging from 20% for older couples to around 32% and 35% for older single males and females, respectively (Wilkins et al., 2020). Low income (low economic capital) is the major driver of energy poverty among older Australian households (Azpitarte et al., 2015; Nelson et al., 2019). Although the extent of financial hardship experienced by Age Pensioners depends on their specific circumstances (including housing tenure and housing conditions), research (Per Capita, 2016) has shown that if a person is solely reliant on the Age Pension, it can be difficult to fully participate in society not only economically but also socially, suggesting a connection to social capital as well. This is especially so if the person concerned has high accommodation costs (private renters are particularly vulnerable) or other extraordinary expenses; for example, health requirements not covered by Medicare[55] (Morris, 2016).

Despite being conceptualised and measured differently, there is an important connection between income poverty and material deprivation (Saunders & Naidoo, 2018; Townsend, 1979). Material deprivation happens when low-income households "have to go without things that are widely regarded as essential, that this restricts their lifestyle, and that

[54] The HILDA report defines a person to be in relative income poverty if household equivalised income is less than 50% of the median household equivalised income (Wilkins et al., 2020).
[55] Medicare is Australia's universal health insurance scheme. It covers most medical costs, but there are important omissions; for example, most dental treatments, physiotherapy, podiatry, glasses and contact lens are not covered or coverage is limited. Also, specialist fees are not fully covered.

it is difficult to balance their weekly budget" (Berthoud et al., 2004, p. 12), which gives an idea of their often unsatisfactory living standards and financial distress caused by the lack of sufficient income. Energy poverty is one of the ways material deprivation is experienced through the lack of appropriate and diverse types of domestic energy services, such as space heating/cooling, water heating, lighting, cooking, and entertainment (Bouzarovski & Petrova, 2015). Conversely, other studies have shown that, although there is a correlation between energy poverty and material deprivation, utilising only deprivation indicators as a proxy for the likelihood of energy poverty may result in an inaccurate identification of energy poor households and ineffective alleviation measures (Marchand et al., 2019). Consequently, this corroborates the need for developing broader and better measures of energy poverty as discussed in Chapter 5.

Increases in energy costs have placed particular pressure on households that are reliant on government benefits for their income (WACOSS, 2018). Economic capital can enhance someone's opportunities and capabilities to lead a decent life, defined by Sen (1999, p. 18) as a person's overall capability "to lead the kind of lives they value and have reason to value". The interviews demonstrated that relying solely on the Age Pension for their income often meant budgeting for every cent, living very frugally (including frugal energy practices) from pension to pension and not being able to lead an enjoyable and decent life after retirement. This is particularly so for older people living by themselves (Wilkins et al., 2020). Also, as mentioned, housing costs can be a pivotal factor.

Seven interviewees commented on how their ability to pay energy bills was reduced when they retired and became completely reliant on the Age Pension for their income. The limited income and the increasing energy prices upset Charles (70 years old, social housing tenant). He had to use his credit cards to pay bills on time and later figured out how to pay the debt. He highlighted that, despite the constant debt, having the credit facility significantly improved his ability to pay the bills on time and manage his finances:

> *I mean, the [energy] costs are like, three times what they used to be. What the hell? And we keep hearing the story, "They've only got up to 130%". But no, if you go back, you know, I remember paying, you know, $30 and $50 or $60. Now it's $140 or something. It's $180 sometimes. I manage it, but I suppose by using a credit card… If I didn't have that credit facility, I would find it very hard. Using that credit facility allows me to [cope]... But if I didn't have that. I mean, I would be struggling. So I'm putting myself in debt … to cope.*

Other interviewees mentioned how since their retirement their energy practices changed due to spending more time at home, and they had to adapt to a different lifestyle to try and keep energy bills lower. For some, energy poverty was an issue that emerged only when they retired. When they were in the labour force, they would not even notice the energy bills. Iris (77 years old, affordable housing renter[56]) described how she changed her mindset and adopted a more frugal lifestyle, including reducing her energy consumption at home, to be able to make ends meet with the Age Pension.

> *That kind of life [when working] is a bit changed. When you don't need to worry about money... Now, I try to actually budget. I used to spend a lot when I was quite well off. But now you have to budget yourself. So I don't feel that, you know, I'm losing the quality of life or whatever, because I live accordingly. And then I don't look back… The good old times… You know, I don't look back. That's the best, huh? If you look back and then you say, "I used to have this. You know, I used to have that, whatever. Money doesn't matter… you spend, you know…", but now you have to think. So I try not to look back … and just live accordingly. You have to switch your mind that way, you know. Otherwise, you will cry all the time.*

Iris did not feel ashamed of having to lower her expectations and "live accordingly". She developed a new "sense of place" after retirement, which forced her to adjust her aspirations. Rose (65 years old, affordable housing renter), on the other hand, was battling with her energy bill and other expenses and was considering returning to work to improve her financial situation:

> *The pension is [so] you can stay alive, but you will not be able to go on a holiday … And so to be honest, I am thinking of going back to work, so, I can have a better quality of life, yes. Then I could go on a holiday, have enough money without budgeting too tightly. You know, it gives me anxiety to sort of [think] like, "Oh my God. Will this be enough after the third month [for the quarter energy bill]?" You know that is no way to live. Other people I know don't live like that ...*

It is clear that Rose was not satisfied with her quality of life. Going on a holiday or not having to budget too tightly for the energy bill are capabilities for a decent life that she did not

[56] This is a government subsidised rental scheme different from social housing. According to the NSW Government (2018), affordable housing properties available in NSW have been funded under the National Rental Affordability Scheme (NRAS)—an Australian Government initiative that offered financial incentives to approved housing providers in order to supply new and affordable rental accommodation (Morris, 2021). Eligibility for affordable housing depends on household income (limits set by the NSW and/or Australian Governments). The scheme applies to people on very low to moderate incomes and enables them to apply for a lease for a fixed term in specific locations. Rents can be set in two ways: either as a discount of the current market rent (usually between 20%-25% below the market rent for a similar property in the same area), or as a proportion of a household's income (between 25%-30% income for rent).

have due to her low economic capital. A key factor for Rose was the cost of her accommodation. She was in an affordable rental scheme, and paid a bit over $200 per week, using over 40% of her income to pay for accommodation.

For other interviewees, material deprivation and low income had always been a feature of their lives, as seen in Section 5.2. They grew up in low-income families and had never had much economic capital. Energy poverty was something they have had to endure their entire lives to the point where they would not recognise themselves as energy poor households, because they knew nothing different. Samantha's observation captures this perspective:

> *I don't have a poverty consciousness about life. … That's the only way I survived what I've done… But that's sort of also down to the fact that I did have that frugal upbringing. And I grew up with [energy poverty] …. We had to cut the wood to make the fire go.*

She grew up on a farm with no electricity and limited resources, and this shaped her habitus with respect to her enduring thermal discomfort and being proud of that resilient characteristic, rather than resenting her energy poor experience. Interestingly, Samantha indicates that she experienced another form of energy poverty in her childhood years – not having access to modern energy supply and services. Perhaps not having access to electricity in her formative childhood years shaped her own understanding of energy poverty and scarcity. Despite restricting her energy usage, she does not hold a "poverty consciousness", as her current situation, when compared to her previous condition, can be considered a major improvement.

6.1.1 Extraordinary expenses and energy poverty

Another common issue related to energy unaffordability was when energy bills came at the same time as other major expenses, such as rent or council rates, medical expenses, water bills, etc. All but two interviewees lived from pension to pension and had minimal savings. Even homeowners whose housing costs were relatively very low, worried about paying the energy bill in the context of other bills. For example, Mary (70+ years old), a homeowner, always worried about energy bills when various bills were due around the same time:

> *Sometimes they come all together, you know! They come the [council] rates. Then come insurance for the car, for the house, for the contents… Sometimes it's more than $3,000.00 together… I have to be prepared for these ones… The [council] rate is nearly $500… Yes, it is about more than $2,000 a year. And I prefer to pay it four times because I can't afford to pay it all together for all the year. And sometimes come the telephone*

bill, or the electricity bill, or the gas … If it stresses me? Well, sometimes, when many bills come together… Then I start to think, "How to [pay] …?".

Anthony, another homeowner, also mentioned that his cost of living varied substantially during the year, and affected how affordable he would consider his energy bills, particularly because higher energy bills were expected around the same time (summer and winter bills):

The cost of living varies in my case. Quarter to quarter is the way the big bills flow in. Now if I've got, you know, house insurance or motor vehicle insurance, or health insurance. They come at all different times of the year and a lot of them are annual. So, I have a big bunch of bills in January, massive bunch of bills in January. And I've got one big bill in July-September.

In many cases, particularly for renters or those with low budgeting skills, extraordinary expenses could put them behind in energy bill payments or force them to pay interest on credit cards or even borrow money at excessive interest rates from payday lenders[57], as Daniel (53 years old, social housing tenant) recounted:

Or the other one is [to] apply for a personal loan through a payday lender, which I have done in the past. And you know, just get money that way. Get cash through there and just pay the bill and then that's all fixed and I repay the payday lender.

Jessica (65 years old, social housing tenant) worked full-time until her early-sixties but had to leave the workforce to care for her ill daughter. The extraordinary medical expenses consumed all her savings, and reduced her ability to pay household bills, including electricity and gas bills:

I was working full time and then my daughter got sick. And then she developed mental health problems, like she didn't want to live like that anymore. So I left work and looked after her. It was either that or lose her. So, I paid all the bills. Like I got a psychology person for her to go a few times a week and you know, just used all my money up that way. The mental stress of knowing that your money is running out and you had to pay your bills. You know, it's just the stress of knowing you have to pay your bills, your rent, your electricity, your gas, everything... [Plus] food, and support your daughter.

6.1.2 Energy poverty, high rent, and lack of agency

The interview findings corroborate previous studies (Chester & Morris, 2011; Munyanyi et al., 2021; Nelson et al., 2019) on the difficult situation that private renters experience with

[57] Most payday lenders in Australia charge an establishment fee of 20% of the amount borrowed and a monthly fee of 4% of the amount borrowed (Moneysmart.gov.au, 2021). For a $2,000 loan, that's a $400 establishment fee and $80 for the monthly fee.

respect to energy poverty. As the reports produced by Per Capita (2016) and WACOSS (2018) stated, home ownership is the most important determinant of financial security (and financial wellbeing) of older Australian households, particularly those primarily reliant on the Age Pension. In Australia, housing costs[58] can vary from an average of 3% of the gross weekly household income for owners without a mortgage to 32% for lower income households renting from a private landlord (ABS, 2019c). As noted by Morris et al. (2021, p. 125), if a person has to use a considerable proportion of their income for rent, "their capabilities are necessarily severely constrained. They simply do not have the opportunities to pursue what they value and their agency and choices are severely circumscribed". It has a major impact on their capacity to pay energy bills and use energy at home at adequate levels. Moreover, according to the AHCD, more older renters (27%) suffered from mental health issues, such as anxiety, depression and stress than homeowners (14%) and accounts such as the ones portrayed by Morris et al. (2016; 2021) substantiate the statistics.

Interviewees who owned their homes but relied completely on the Age Pension for their income, experienced energy poverty in less severe ways than renters. They were generally able to manage. However, for renters, particularly private renters, energy poverty not only was caused by their low income and high housing costs, but it also aggravated material deprivation on other fronts and impacted on living standards significantly. Sonia (74 years-old, private renter) was in a particularly difficult position. Not only was she totally reliant on the government Age Pension for her income, but she was also a private renter. This meant that unlike older social housing tenants whose rent is set at a maximum of 25% of their income, Sonia had to pay a market rent. In Sydney at the end of 2019, the median weekly rent was $525 for houses and $510 for apartments - she had managed to find an apartment for $290 a week. In contrast, the rent for social housing tenants, calculated at 25% of income, was around $119. The following excerpt highlights her daily struggles:

> *I can just manage… By living very frugally. But there's nothing left over. Nothing to save a little bit for emergencies. Nothing. You are just able to exist. Yeah, that's what you must have highlight. Just existence money is all you have. I've been waiting for today, which is payday, you know. I'll tell you what I had left. I had $2 yesterday.*

[58] Defined by ABS (2019c) as the sum of rent payment, rate payments (water and general), and mortgage or unsecured loan payments (if the initial purpose of the loan was primarily to buy, add, or alter the dwelling).

Sonia's desperate situation meant that energy poverty was a permanent feature of her life. The financial insecurity on top of the housing affordability issues meant she constantly worried about energy usage (see Chapter 8).

The rent is the major expense for older low-income private and social renting households and means less disposable income for other matters, including energy bills (ABS, 2016b; Per Capita, 2016). Renting, either from the private market or social housing, frequently meant households had very little or no agency over their dwelling's energy efficiency. Many commented on being at the mercy of real estate agents or landlords in regard to urgent repairs needs, or having no permission to make additions or modifications to their dwellings. Like most Age Pensioners, Sonia could only afford the low range in the private rental market. The apartment was in poor condition and in winter thermal comfort required the heater to be on for prolonged periods:

> *It's very cold in the winter [but] that is all I can afford. No wonder, I think I was using a fair bit of electricity in winter to heat the blow heater, because the state of the unit when I moved in… I was living with the most atrocious carpet. You have no idea! And it'd never been changed. From my neighbour who's been there for 15 years, said it was never changed. So, it was really bad. Very thin, threadbare. I could feel the stone underneath. Very cold. It was extremely cold in there. The first winter, I nearly froze to death, so I think I've had that little heater on a lot.*

In other cases, appliances owned by the housing provider were not replaced unless broken, which meant that the households affected had to use very inefficient appliances and could not afford to change them or did not want to spend money on replacing them as it was a rented unit. Situations where households had difficulties in dealing with social housing providers were not so prevalent, but existed. Samantha, for example, wanted to change her inefficient hot water system, but was not able to:

> *I got a plumber in first off, within the first week of being here, to see if I could get rid of this [electric] hot water system. And then the NSW housing corporation said, "No". And I was so exhausted, but it was a waste of energy dealing with it. It's a mentality that I don't understand.*

Most of the interviewees in social housing, like Bill, believed that the government should be doing more:

> *This is [the same] for majority of the low-income people in public or social housing, because to be in public or social housing, you don't have hundreds of thousands of dollars… and you basically live from pension to pension… so, they should be listening to*

us … If they [the dwellings] are very cold, then you probably require insulation… but that's a cost… and then the government would say – hang on, that's a cost. We sort of know these things, but we don't understand them widely. And the government properties… they don't do their best to [ensure] the tenant's comfort.

6.2 The home, its conditions and energy poverty

Being out of the work force or dealing with certain medical conditions, often meant interviewees would spend most of their time at home. As one interviewee said, their whole lives were "home-based" and there was not much difference between their energy consumption patterns during weekdays and weekends. In this sense, their home features, and design and construction characteristics played a major role in their ability to use energy efficiently and save on energy costs. Besides acknowledging that spending more time at home than the average Australian household might mean greater energy needs, it is important to note how this affects their options for suitable energy plans, as time-of-use (TOU) tariffs[59] might not be appropriate for this household group. Although there are no studies in Australia that investigate how TOU charges impact on older households' bills, a pilot study of almost 7,500 households in the US indicated that electricity bills disproportionately increased with TOU charges for households with elderly and disabled occupants, due to their inability to shift use times associated with "being home-bound and having a greater reliance on energy for medical equipment, temperature control and completing daily tasks" (White & Sintov, 2020a, p. 54).

6.2.1 Inadequate building envelope

As seen previously in Chapters 1 and 2, the Australian existing housing stock is in the main poor with respect to energy efficiency and needs adaptation urgently. Two interviewees lived in homes that were over a hundred years-old and 13 lived in more than 30-year-old homes. Nearly three quarters of the homes were not necessarily compliant to NatHERS current requirements[60], as seen in Table 6.1 below.

[59] Time-of-use tariffs mean that the price of electricity changes at different times of the day, according to energy demand (AER, 2020b). In Australia, they are classified in three charges (peak, off-peak and shoulder) that vary according to season, state and retailer.

[60] I say they are not necessarily compliant with NatHERS guidelines, because they were built before minimum energy efficiency requirements became mandatory. The interviews strongly suggest the homes were not energy

Table 6.1 - Age of interviewees' dwellings

Dwelling age	No. of interviewees
Less than 5 years old (necessarily compliant to NatHERS)	2
Between 6 and 15 years old (necessarily compliant to NatHERS)	4
Between 16 and 30 years old	4
Over 31 years old	13

(Source: the author)

The majority of interviewees had no or little idea about what had been done to make their homes energy efficient. For example, many were not sure if there was any insulation present. A few provided a comparison between current and past homes with respect to thermal comfort (whether they would feel warmer or colder in current home), and that is how they could assess the dwelling's energy efficiency. In general, interviewees had difficulty in identifying the building materials and components of their homes as technical knowledge is required. In this sense, policies to compel mandatory disclosure of (existing and new) dwellings' performance, as suggested by Daniel et al. (2020), could be beneficial for households to understand how their building envelope affects their energy costs.

Some "unseen" or "taken-for-granted" domestic appliances were usually forgotten by interviewees in terms of energy efficiency. Due to COVID, I was not able to do in-person home inspections, and this posed a limitation to the study, as categorising their building materials and construction characteristics would have yielded useful information with respect to the dwelling envelope thermal insulation and energy demand. Nevertheless, indications of how their home characteristics influenced their energy practices and their experience of energy poverty was still possible, supporting the argument of the home as a context where habitus and practices are shaped.

Although most interviewees had little knowledge of their dwelling materials and systems performance, all of the interviewees knew how their homes affected their energy practices. A very common issue was the poor insulation and suboptimal orientation of their homes. Janine, for example, experienced extreme thermal discomfort in summer and knew it was related to the building envelope that allowed too much heat to enter the apartment:

> *No, the thing is that it gets very, very hot here in the summertime and there's nothing much I can do about it. But I always keep my blinds when it's extremely hot, keep those*

efficient and therefore far from complying with NatHERS guidelines. However only a thorough energy assessment could verify that.

closed to try and keep the heat out, but it's almost impossible. It's madness. I was thinking the other day, I'm just going to have to try and cool the place with the fan, but I don't think it'll do much. You even feel the window frames. When you touch them, you can't. You've got to, you've got to take your hand off … It's the way the building's been designed.

Her apartment was on the building's top floor which meant it absorbed external heat not only through the walls and windows but also through the roof. Only one interviewee, Anthony, who used to work as an engineer, had technical knowledge about home energy efficiency and could evaluate his home in technical terms:

One [of the problems] is that the insulation, in my opinion, is poor and because it's brick veneer and has no thermal mass. And because it has no thermal mass and the insulation is poor, that whatever is outside, is inside. In fact, on a warm summer's day, it would be worse inside than outside because you have no wind inside. Now [for winter], I use more heating on a windy day than on a non-windy day. Because there is no doubt that the wind blows the heat off the walls of the house.

Anthony's portrayal points to the importance of insulation and good quality building. The brick veneer, despite providing opportunities for cavity insulation, did not have any and was not adequate. Other common complaints were related to a lack of natural light[61], no or poor cross ventilation, single-glazed windows, and drafts through doors and windows. Many interviewees tried to solve drafts with DIY ("do-it-yourself") measures, which besides representing a physical hazard and risk of falls, particularly in advanced age, was usually not effective. Violet used towels to reduce the draft from her front and back doors:

I will tell you what I do have. At the front door and the back door, the doors are higher and there is a big patch there. I had to put a towel behind the door. So, there is a big draft coming from there and the back door, I have got two towels right in the door so that the draft doesn't come in and on the side of the door. I noticed if you look at it you can see a bit of a gap, so I can't do anything about that, but the bottom, I put a towel there so there isn't a gap… It's funny, the units, they are all done like this.

6.2.2 Inefficient hot water systems, old appliances and electrical problems

Hot water systems can account for close to a quarter of a household's energy use (ABS, 2012b; DIS, 2015), and a very recurrent issue among interviewees was inefficient hot water systems. Interviewees disliked storage hot water systems, as they understood it was

[61] According to the AHCD, around 7% of the older Australians surveyed said their homes did not have adequate natural light indoors, which can be associated with increased use of artificial lighting and poor heat gain during winter (Saman et al., 2013).

consuming energy even though they were not using it. Samantha avoided using the hot water system altogether. Bill felt helpless and anxious about his inability to reduce energy costs:

> *I think also the hot water services in instant tanks "gotta" be one of the main causes of our bills, because of the water temperature. If it ever gets down, well, when we use the hot water, then the cold water goes in, and it clicks in the heater… then it keeps in there… every time… and if you are away for the day… and the water temperature drops down, then the heater will come on again… Then what I deduce is that could be rectified some way, I don't know… and that's my biggest anxiety… The use of water… actually the NOT use of water that still has to be heated and kept at the temperature, which costs money that I don't use.*

The fact that Bill was being charged for an energy capital he was not effectively using made him dissatisfied. This ineffective economic-energy transaction also increased energy costs despite his conscious behaviour. He had a friend that decided to cut off the hot water system to avoid those "unused costs":

> *I had a neighbour; he turned his hot water off… Because he swims nearly every day and goes to the gym every second day and there are shower facilities there... So he has his showers in the swim [area] or the gym and he just turned it off at home – and when he wants the hot water he just uses the kettle. Because of what we were talking about… the hot water system is gonna keep turning it on [regardless] … of the usage.*

Another common issue among interviewees was the age (and therefore energy efficiency) of domestic appliances, as suggested by previous studies (ABS, 2012b; Frontier Economics, 2016). Some interviewees were given second-hand appliances and had no idea about their age, but could tell their energy-star rating, which were always very low. It was very common to hear from interviewees that they had very old—but still functional—domestic appliances such as 30 year-old microwaves, 40 year-old washing machines, and "last-century" fridges. Some of them knew those daily used appliances could be consuming a lot of power, but they did not have the economic capital to buy newer more efficient ones. Even when they replaced the appliances, they could only afford poor energy efficient ones (1 to 2-star ratings).

The energy efficiency of domestic appliances is an important predictor of households' energy costs. For a fridge, for example, that represents on average 8% of a household's energy consumption (likely to be a higher proportion for low-income older households who do not own heating/cooling devices), every extra star saves around 23% on running costs, and the efficiency difference between a 1-star and a 6-star fridge of similar capacity represents savings of around AU$150.00 per year (DIS, 2015; Equipment Energy Efficiency Program, 2020).

In other cases, such as for 30 year-old dryers or 60 year-old air conditioners, interviewees would mostly avoid using them. Denise, for example, mentioned how she avoided using the old air conditioner when she lived in a rented cottage before moving to social housing:

> *In the summer, it was so hot there, it was hell on earth. I had one of those terrible old-fashioned wall-mounted aircons. It dripped water out the back of it into my studio. [It was] probably 60 years old, I would say it would be … And I had to have it on sometimes. And of course, that really ran away with the power. Some of my bills, they might have been $260 for the quarter without any discount.*

In some cases the old appliances were faulty and represented electrical and fire hazards, as Violet reported:

> *I had one [AC] that [a friend] gave me, but it must have been broken or something because it was leaking water. So, I had to throw it out. And then I had another one of fans and it started making, like somebody gave me an old, old one. And it started sparking, so I threw that out because I thought, "No, I am not going to fire up this whole place for nothing". So, I have nothing.*

Their low-income situation prevented households from buying newer and more energy efficient domestic appliances, which ultimately affected how much they would pay for energy. Finally, it is noteworthy that efforts towards reducing energy consumption at home were often offset by the lack of understanding about which appliances used the most energy at home. While most of the interviewees mentioned energy saving strategies, few had an actual clear idea about which appliances were using more power, and many kept using extremely old and energy inefficient appliances due to a lack of economic capital and knowledge about the star rating of appliances. Samantha, for example, would try and make sense of her higher energy consumption in winter with the electric blanket by analysing the comparison with the average household's consumption on her bill, but still felt she did not have enough information:

> *But all I'd look at is the little houses which says this is how much one person consumes and this is what you've consumed. But on the bill, sometimes I go up to another consumption [level] and I don't understand why that happens. If an electric blanket does that [leads to a high bill], I'm pleased I don't use heaters.*

6.2.3 Housing design and renewable energy

A recurrent theme among interviewees was how their home design hindered their energy saving strategies. For those who lived in newer dwellings, they complained about the

open plan design[62], as this required more power to heat or cool, and was seen by them as wasteful. This modern design trend, despite benefits related to shared natural light, layout flexibility, and improved airflow, was not perceived by interviewees as beneficial towards the ability to acquire thermal comfort at a lower cost (Wallender, 2021). Two thirds of the interviewees preferred having a more localised thermal comfort with the use of portable appliances close to the body rather than heating or cooling an entire room to save on energy costs. This evokes the question of whether the WHO (2018b) guidelines for room temperatures (between 18°C and 24°C) can be achieved and whether they are actually feasible for low-income households, particular older ones. Other issues with the modern home design were that too many lights in just one switch prevented them from using downlights. To save on energy, they would use focus lamps instead. Rose, for example, chose not to turn on bathroom lights, exposing another potential fall risk:

> *I do not turn on my bathroom lights when I need to go during the day because it has four downlight bulbs and also because the air demister stays on for a few minutes even after turning the lights off. Some light comes through if the door remains open.*

Renewable energy sources were extremely rare among interviewees, with only one social housing tenant having solar panels on the rooftop of the building. Lauren (87 years old), a homeowner, had received a quote for a solar PV but was advised not to install solar due to high upfront costs, long payback and not optimal building orientation:

> *The guy told me that it wasn't really advisable. Because when he saw how much I [would] spend in all this, he said "Well, I shouldn't say that, but I don't think you are going to save up too much money with solar power".*

An income poverty energy-related common issue was the unaffordability of home maintenance and energy efficient retrofits, as also identified by other studies (Chester, 2013; Liu et al., 2019; Percapita, 2016). For the six interviewees who owned their homes, a major reason for not installing more energy efficient measures was the lack of capital and the long payback period, which has been an issue in previous studies with low-income households (Johnson et al., 2013; Liu et al., 2017; Liu & Judd, 2016). As Anthony commented,

[62] An open plan refers to a dwelling in which two or more common spaces are joined, by eliminating partition walls, to form a larger space (Wallender, 2021).

No, I am too old [to install solar]. If I was young and smart and wise, that's what I would do as a 20-year-old. Because the payback period takes a lifetime.

Their views on renewable energy, however, were clear. If they could have access to affordable renewable energy systems, it would improve their living standard significantly as they would rely less on electricity from the grid and reduce their energy costs – supporting the important discussion on energy democracy (van Veelen & van der Horst, 2018).

If I had solar power or something, I could reduce the bills to zero, then I could use that money for other things, that's all. (Daniel)

6.3 High energy costs and issues with energy suppliers

In most cases, the poor energy efficiency of the home and the low income factors are viewed as contributors for either increased household energy consumption—and consequently increased energy costs—or relatively high energy costs when compared to income levels, respectively. In addition, energy prices in Australia have increased significantly in the last decade (Byrd, 2018; Chester, 2013, 2015). The reasons for higher energy tariffs might vary and few studies in Australia have addressed the underlying factors (Wood et al., 2018), particularly those which relate to the energy field's power relations and "game rules".

Energy bills, among other utilities, are causing particular stress to Age Pensioners, as bills are rising faster than the pension but the eligible rebates and concessions remain stagnant (Per Capita, 2016). For those interviewees who shared their energy bills with me, the proportion of income spent on energy ranged from a mere 2% to over 12%, which shows that an absolute objective measure on energy poverty relative to income is often inaccurate, as many low-income energy-poor households will restrict their energy use to the extreme to keep bills manageable – falling into hidden energy poverty (Meyer et al., 2018). The low disposable income factor, as addressed previously, is undoubtedly the major driver of energy poverty among older households, but high energy costs due to a number of reasons were identified, and this section aims to highlight those.

Low-income older households are paying too much for their energy for three main reasons: they are "loyal" to their retailers but lack the proper engagement, so they are put on standard market rates (with expensive charges) instead of cheaper energy plans; or they are paying too much for their supply charges, especially in regional areas, which represent a large

proportion of their energy bill; and many experience all kinds of issues with retailers leading to over-charged bills, such as estimated readings, faulty meters, additional charges for paper bills, eligible concessions and rebates not being applied correctly and lack of suitable deals for low-income older households.

6.3.1 The premium for loyalty to retailers

Starting with the wrong understanding of being loyal to the retailers, there is misconception on the social relation between client and retailer, as expressed by Willand and Horne (2018). Some interviewees believed that being loyal to their retailers meant they would be valued for that, which could increase their credibility with the institution. In turn, this loyalty would return a more efficient exchange between economic capital and energy capital through more competitive energy plans. Nevertheless, the neoliberal energy market "game rules" do not reward loyalty, as the free-market dictates prices and customers are responsible for their autonomy and agency in shopping around. This misconception between loyalty and the free market is reflected in Bill and Gloria's conversation:

> *Bill: No, I never worried about that [comparing costs with other retailers]. I have the online thing… where they say you can shop around and check other contracts… but I think… Once we were… We used to be like our moms and dads… where we just stay with the company… and we sort of continued on… Yeah... Let's face it… we have kind of this loyal[ty] thing… because generally, it's a good thing...*
>
> *Gloria: I think the younger generation are the ones who shop around and go online and compare and jump providers and all that…*

Bill's words "like our moms and dads" emphasise the role of family upbringing and resultant habitus in shaping their current experience of the energy market. Likewise, Gloria expressed it as a generational aspect, which is reasonable particularly because in previous decades the energy sector was owned, run and regulated by the government, and "shopping around" was not an option. Younger generations whose first sign up for an electricity account was already in the contemporary "game rules" are more used to shopping around.

Ten interviewees had been with the same retailer for decades; eight of them had the same retailer since the privatisation of the energy market[63]. Three interviewees did not even

[63] The NSW Government started the privatisation of the energy system in 2010. Victoria's energy system privatisation happened earlier between 1995-1996.

know who their retailer was. Seven interviewees had changed providers in the last 2 years (not all had gotten better offers, and regretted making the change), as detailed in Table 6.2.

Table 6.2 - Time interviewees had been with the same retailer

Years with same retailer	No. of interviewees*
At least 2 years	7
At least 10 years	5
More than 10 years	10

* One interviewee did not reply to this question.

(Source: the author)

Having the opportunity to check their energy bills, some of them were paying up to 30% more (when compared to the same retailer's current market offers online) in their usage and supply charges just because they had not negotiated their energy plans recently. After I checked Bill's electricity rates and provided advice on a cheaper energy plan within the same retailer, he felt annoyed:

> *You see… they [retailers] are very reluctant to help you get better deals… Very reluctant to inform you of better deals… By not doing that, now I realise I could be paying much less as you are saying.*

There is also an issue of lack of interest (potentially caused by low levels of energy literacy, as it will be explored in Chapter 7) or, as some interviewees said, no personal energy to shop around, as it does require someone to be resourceful in terms of time and cultural capital. As Amelia (70 years old, social housing tenant) said: "It's the path of least resistance, I think. Some people call it laziness". It is interesting to perceive Amelia's self-guilt feeling when she says some people (possibly those who feel more empowered in neoliberal markets) may interpret her act as laziness. Other interviewees mentioned that changing providers was exhausting, stressful and time-consuming, reporting that past attempts to change retailers took more than two hours over the phone to be completed, which discouraged them to do it more frequently. Issues of distrust and the fear of changing to a worse retailer were also common, as Janine recalled:

> *I've always been, I've just thought "It's better the devil you know". I don't shop and change. That's me. If you did shop and change, but that's a whole other section of your life that you'd be giving away. You'd be forever checking price … So, I stick with AGL. And even though they are awful, they are the ones I have the problems with.*

Another common problem was the price of energy in regional areas. Reports produced by the St Vincent de Paul Society (2021; 2020; 2018) indicate that households serviced by the Essential electricity network (regional NSW) pay significantly higher network charges than households serviced by the other two NSW networks (Ausgrid and Endeavour) in Greater Sydney and metropolitan areas. Understanding the variation on supply charges across locations and retailers was paramount for Daniel, who lived in regional NSW, and was constantly looking for the cheapest energy plan:

> *I've noted a large difference between the Ausgrid (Sydney) and Essential Energy (Regional NSW) supply charges, which certainly affects costs. It is not necessarily how much a person uses [energy], but rather where they live and what their income is that may affect affordability.*

Daniel highlighted that it is not necessarily how much energy a person uses that contributes to a high bill. For lone person and couples only households, supply charges can represent over half of the total energy bill (Chester, 2013; VCOSS, 2017). Thus energy saving practices can only be effective in reducing part of the overall energy cost. Efforts to reduce supply charges are dependent on switching retailers, as Daniel explained:

> *The bill can be high because the supply charge is higher. From one supplier to another there can be a difference. One I saw was $2.50 or something for supply per day, whereas other ones like the one I am on at the moment is $1.30. So you know, when I get that bill at the end of 90 days or 91 days, you know, it can be a big difference. That's an extra $90 just for supply, you know.*

Remarkably, Anna, a private renter, would compare electricity prices in different cities before choosing where to set up home:

> *I was comparing electricity prices. I looked at Port Macquarie [NSW] where I used to live. My uncle's house in Melbourne … and a place outside Brisbane. I had no idea that the price of electricity varied so much and I'd forgotten about Service to Property charge - which they still charge you even if you had no electricity for the day because they were servicing the lines and you had to freeze your tail feathers off mid-winter.*

Besides being aware of the major differences in supply charges across different locations in the three states (NSW, Victoria and Queensland), she also expressed dissatisfaction with the fact that these are fixed even if there is a network maintenance or power interruption.

6.3.2 The premium of no entitled rebates and concessions

In NSW, the Low-Income Household Rebate is a credit on each quarterly electricity bill, up to a total of AU$285.00/year or around AU$78c/day, which is not far off the daily supply charge in capital areas. The NSW Gas Rebate is a similar credit up to a total of AU$110/year or AU$30c/day. Therefore, the low-income rebates help older low-income households reduce their energy costs significantly. Janine mentioned she has been with the same energy provider for about 40 years and that when her mother was alive and lived with her, she used to receive the energy rebate. After her mother died, the electricity account had to be changed to her name, and because she was not a pensioner yet, she felt the difference in her energy costs:

> *It was a lot cheaper then [before mother's passing]. Since then… I don't get those pensioner discounts. So that was another reason why I sort of stopped using the heating and the cooling in summer. Because I don't get those discounts. But when, like I said, if not for another two and a half years before I could ever get the pension.*

At least four interviewees were not receiving the low-income rebates they were entitled to, even though they had contacted their retailer and requested it. Charles was one of the interviewees who did not know he was not receiving the pensioner rebate. When I pointed that out to him, he was furious with his supplier:

> *Well, now that's ludicrous, right? So this is what they do, you know… They never make the mistake the other way. So I'll go into that right now. I'll phone them up now. I'll say "I'm gonna move [retailer]" and see what happens… I've got [to] thank you because you've told me that I'm not getting that [rebate] which is crazy. I can't believe that. I thought I was getting that. I set it up. I know I set it up, as a pensioner. Bloody nonsense.*

Lauren was another interviewee who was not receiving rebates. She told me that she had changed retailers about a year ago and regretted it, because it was done by phone and she felt pressured to accept the offer. Because they had asked for so many documents, she was not sure if she had talked about the concession rebates. Rose said that she knew about her rebate eligibility and asked for the retailer to apply it to her account, and she phoned them, but the person who took her call did not provide accurate information and left her clueless as to how to take it further:

> *They promised that they are going to give me some sort of concession. They know my age. They know that I'm a Centrelink[64] recipient. So, it says in writing that they have some sort of a concession or some kind of reward, yet when I called them, this guy I*

[64] The Australian government agency responsible for managing social security payments such as the Age Pension.

spoke to said, "Oh, we don't have a scheme like that. We've had that before…" This was the very unhelpful guy and plus why is it that when I [asked] … "Look, you know I'm this age, I should have a concession, can I, you know, and you guys knew that when I signed up. Can someone explain to me where is the concession, how is it calculated, you know?" So, no one has really come back to me about these questions.

Lack of knowledge about the rebates is not unusual. Around 28% of eligible customers appear not to be accessing the Low Income Household Rebate for electricity, and around 44% of eligible customers are not accessing the NSW Gas Rebate (NSW Department of Planning Industry and Environment, 2019). Amelia was one of those households who did not even know there was a rebate for gas bills:

I do receive it [the rebate] on the electricity, and I have received it for a long time since I've been a pensioner, because that was very clear. The New South Wales gas rebate - I'm really annoyed about [it] because I did not know about it, and I only started receiving it since October last year [2019], [and] I could have been receiving it for five years, but I did not know about it. You know, there was no information with my bill, no information from Social Security. I just didn't know.

Nevertheless, it should be stressed that rebates can only be effective in alleviating households' energy costs if energy rates are competitive. If not, low-income households are still subject to unaffordable energy bills. After moving to a rented unit in Liverpool, Sonia's electricity bills skyrocketed, and she had no idea her rates had changed. Previously, her bill was rarely over $200 a quarter. After she moved, it went to nearly $700 a quarter, representing over 12% of her income. Even though she was receiving the pensioner's rebates, it was not sufficient:

Even so [with the low-income rebate], it was atrocious. Without that, say without the $75 [rebate], $600 would have been $670. Out of this world. I have never had such bills before. … I was on the wrong plan.

6.3.3 The premium of "guesstimates" and faulty meters

Other very common issue among interviewees were high "estimated" bills. In some cases the amount charged by the energy supplier was a guesstimate based on bigger households' (who lived there previously) energy consumption patterns, and that meant very high and unaffordable energy costs for low-income older households. One interviewee claimed that she was forced to pay a debt from previous tenants:

When I moved in here, 12 years ago, probably the people who used to live in government housing, they left a bill that I had to pay… Otherwise, they [the provider] would not

connect. They didn't connect. $500 or something. And then I asked them, back in the day, you know, and they said, "It's just probably you used it". But when I moved in and then, you know, after three months, I don't use that [much]. Why $500 something for three months? I had to pay. And then next year, the following year, I was looking at winter debt. That's less than half, you see, huh? So I was paying for someone else that left that bill. (Iris)

Besides the cultural capital required to be able to challenge retailers on guesstimates, some interviewees reported they were afraid of calling their retailers to query their meter reading because of the call-out fee, as Bill explained:

The problem is also that if you think the meter read is wrong, they'll send someone out. But if that meter reading is right, you're gonna have to pay a call out fee. That's what they do, see? Because the call out fee isn't cheap either. It's probably the same amount of the bill. So, that puts you in two minds. But I knew mine was wrong, because of that excessive [amount]. But could you imagine older people saying get used to get a bill with $100.00 figure quarter after quarter, and so they get one for $150.00 and they don't understand their bill and they say – "Oh, it must have went up". And that's it.

Luckily, Janine persisted about a faulty meter and estimated bills. She had the cultural capital required to challenge her energy supplier and persisted despite endeavours to fob her off. Because she kept paying the overcharged bills, in order to preserve her credibility (symbolic capital) with the retailer, after the issue was resolved, she had enough credit in her account for one year.

The meter for the gas stove is in my pantry, and it's quite visible. So, when I received my first bill, … I could actually see the amount that was used. And it was quite different to what was on my gas bill… [but] they [retailer] said that I've used all this water. So, I rang and queried it. And then they told me, they just dismissed it [my query]. And then it goes, so another three months went by, and it was [high] … again. And I thought I know I'm not using all this energy for hot water. And for the gas because I'm not cooking, I'm not doing anything, and it's still the wrong amount. And then they informed me that it was one of the meters and they'd known about it, this other meter that I couldn't see, it was faulty … They kept on sending the outrageous bills … So, when I got in touch with the Ombudsman. I'd overpaid because… whenever I get a bill, I naturally go and pay it because I didn't want to be in arears or anything like that. And I have not had to pay my gas bill for over 12 months. I've only just started paying it as of this year. Because I don't have to pay it, I was in credit so much. If I hadn't persisted with it, it would still be a faulty meter, even though they knew it. And I'd still be paying for these estimated amounts.

Anna's saga unfortunately captures all the possible issues with energy retailers. The problem she had with her energy supplier contributed to her becoming homeless and having to house-sit. When she left her abusive partner in 2007, she moved to Port Macquarie, where

she started to rent a 60 year-old apartment. To get her electricity connected, she had to pay a security deposit[65] for the first time in her life. The first quarterly bill arrived, and she was charged $700.00 and no pensioner's rebate was applied (even though she was eligible and provided the required documents when she signed the initial contract). Later she discovered the energy provider had not read the meter and just used the last tenants' average consumption, leaving her with an enormous bill and stress.

> *[When] I compared it [the bill] with the meter readings - I was way overcharged! The people before me had been a family of seven! So here's me, a single person recently transferred from unemployment to a [disability] pension, with an abstemious attitude to electricity usage being charged for … the whole quarter use of seven people. Did you ask about stress? When I asked about my concession card, they said it couldn't be backdated. Even though they had the evidence that I'd provided my concession number when I signed up. I'd just moved to a new town where I knew nobody. I was paying rent well over the odds and I'd left most of my furniture and Manchester [bed linen] with my ex, so I was trying to refurnish a home and get household items and [then I] get charged a ridiculous electricity bill about five times what it should have been. My health was already poor. I just did not need this kind of stress!*

6.4 Conclusions

This chapter drawing mainly on the in-depth interviews conducted, explored major drivers of energy poverty among older low-income Australians related to the well-known triad of low incomes, poor home conditions, and high energy costs. All these causes are primarily associated with economic capital and its exchange with energy capital. It was possible to drill deeper into how factors such as housing tenure, old appliances and open plan design, misguided understanding about the energy field game rules and overestimated bills all contributed to energy hardship.

Confirming other Australian studies (Nelson et al., 2019), the low income factor is likely the most important driver of energy poverty. The annual income of those solely dependent on the Age Pension (approximately AU$24,770 per year including all pension supplements) is already below the Australian low-income threshold, which could be interpreted as symbolic

[65] A security deposit is an amount of money an electricity or gas provider may request when establishing a new account. It is applied, among other reasons, when the consumer cannot demonstrate a good credit history, and can be up to 37.5% of a customer's estimated bills. If all bills are paid on time for a period of one year, the security deposit is refunded to the client (see EWON NSW, 2021b for more details).

violence since the government is perpetuating inequality and making it harder for Age Pensioners to cope. For those who have high accommodation costs (particularly in the private rental market) and/or extraordinary expenses related to health issues, the lower disposable income results in greater difficulty with their energy bills.

Furthermore, poor housing conditions, as portrayed in Chapter 5 and further explored in the interviews, can increase household energy needs and costs. Only six interviewees lived in homes compliant with the NatHERS guidelines. Poor insulation and suboptimal sun orientation accentuated thermal discomfort. Inefficient hot water systems and old appliances, that were unaffordable to be replaced due to high costs, had their usage curtailed to minimise energy consumption. In addition, even for new homes which followed NatHERS requirements, there were issues with the housing design that made it difficult for interviewees to reduce their energy usage with heating/cooling appliances.

In some cases high energy costs were due to unnegotiated and poor energy contracts. The majority of interviewees had been with their energy retailers for over five years with no direct negotiation about their rates. In other cases, high supply rates (that could represent over half of the energy bill) were undermining their efforts to reduce energy usage. On other occasions, guesstimates from the retailer could be very difficult for those on extremely tight budgets. The fear of high call-out fees prevented households from challenging retailers. Disputes over wrong bills and rebates and concessions were stressful and time-consuming for interviewees, and usually required knowledge and competence to challenge retailers. This topic will be further explored in the next chapter, among other important contributors to energy poverty, besides economic capital.

Chapter 7 The Causes of Energy Poverty among Older Australians - Part 2: Other Capital-related Factors

Introduction

Apart from the main triad of energy poverty causes (Boardman, 1991) discussed in the previous chapter, subsequent studies have exposed political, cultural, and structural drivers of energy poverty (Bouzarovski et al., 2014; Grossmann & Kahlheber, 2018; Petrova & Simcock, 2019). This chapter complements those studies. Whilst acknowledging the centrality of economic capital, other key contributors to energy poverty among older Australians are examined. The importance of cultural, social, and symbolic capital is highlighted.

Section 7.1 explores the key issue of energy literacy among Age Pensioners, which can be understood as a required cultural capital in the energy field, and how this potentially causes their energy costs to increase despite their restricted energy usage. In this section, I comment on their difficulty to engage with the market online and offline and the difficulties in reading and understanding the energy bills. Low levels of computer literacy and digital exclusion contribute to low levels of energy literacy and, therefore, low energy capital. The new rules of the "energy game" since privatisation of the energy system are not fully acknowledged nor understood by many Age Pensioners and much of the general population (see AEMC, 2017; Energy Consumers Australia, 2020; Mountain, 2018).

In Section 7.2, I explore how the low levels of social capital and issues around their social networks (in some cases resulting in social exclusion) are an important cause of energy poverty among Age Pensioners. Due to lower computer literacy or higher digital exclusion (no access to computer and internet), many interviewees relied completely on "word-of-mouth" to learn about energy-related subjects. Not having a support network that encompassed solid social relations with family, friends, neighbours, and institutions meant some Age Pensioners suffered higher levels of energy poverty.

Lastly, I discuss other factors that contribute towards energy poverty among older low-income households, such as the gender factor (Section 7.3) and health related issues (Section 7.4). Strengers (2014, p. 25) argues that "smart energy technologies and strategies embody a rational, individual, and masculine image of the energy consumer: Resource Man". Following

Strengers, I argue that policy frameworks are needed to compel the energy market to engage in a more active way and simplify the process for the average consumer or, to contrast on the spectrum, the "Unresourceful Senior Woman", as much as it does for the "Resource Man". The habitus of older low-income women and the lower levels of capital when compared to the Resource Man play an important role in their experience of energy poverty. Finally, I discuss how COVID has aggravated energy poverty in Section 7.5. The pandemic significantly affected their habitus and their opportunities to maintain and further acquire social and cultural capital. The chapter concludes with a brief summary of the main findings and sets the scene for the following chapter on the impacts of energy poverty among older Australians.

7.1 Cultural capital, energy literacy and difficulty engaging with the energy market

Although there have been some efforts in trying to define energy literacy in the Australian context (Hogan et al., 2019) and worldwide (DeWaters & Powers, 2013; Martins et al., 2020), there is still no consensus. Hogan et al. (2019, p. 50) define an energy literate person

> *As someone with the appropriate level of knowledge which empowers them to make informed rational energy decisions and actions which have a positive outcome for the individual, and ultimately, society at large.*

However, there is not much evidence on what kinds of knowledge are essential or which level of it is deemed appropriate. Some studies have focused on the awareness of energy consumption, measures to reduce energy costs and energy efficient retrofit investments (Brounen et al., 2013; Trotta, 2018) among households. Despite the limited research on energy efficient retrofits among older households in Australia, that invariably touches on the subject of energy literacy (Johnson et al., 2013; Waitt et al., 2016). There is usually a stronger focus on energy literacy towards sustainable behaviour and practices, but not so much when it comes to using it to mitigate energy poverty. There are no studies that deeply investigate the matter among older low-income households in energy poverty. I argue that energy literacy is an important part of the cultural capital required to play the "energy game". Those who have lower levels of energy literacy are likely to be in a disadvantaged position in the energy field.

This present study has found that the lack of energy literacy is an important contributor to energy poverty among Age Pensioners, and that it not only relates to financial literacy, but

also to computer literacy. Two thirds of the interviewees had some difficulty reading and understanding their energy bills and how they were charged by their retailers. Because they found it too complicated to understand their bills, they usually did not monitor or track their energy consumption, which resonates with the lack of interest suggested by Amelia (see page 139). They faced additional challenges when trying to learn about the energy market and engage with it, such as bad customer experiences and lack of suitable services and communication strategies for seniors, which lead to a general lack of trust in the market. Other reasons for not engaging with the energy market included the paradox of choice (Schwartz, 2004) and the intentional "confusopoly" (Adams, 1997) of the energy market.

7.1.1 Difficulty in reading energy bills and understanding energy charges

In a study conducted by Johnson et al. (2013), over a quarter of the 85 household participants (where half were over 65 years old and the majority were homeowners) reported that their energy bills were difficult to understand. My study accords with that of Johnson's et al. (2013); most of my interviewees had difficulty understanding their energy bill. They had difficulty making sense of the energy charges and the different types of electricity tariffs. It was also complicated for them to check whether the discounts and rebates were being applied, or whether they were consuming too much or too little. They did not find the comparison graphs useful. Because of that, they would mostly only monitor the overall amount being paid, and their energy practices and behaviours, but not the actual costs. The following excerpts illustrate their difficulty and lack of knowledge. Sonia only realised she was being charged very high rates in a non-suitable deal for her income and household lifestyle when she approached a charity:

> *They [retailers] probably think that most people would find that out [about the high charges] for themselves. In my case, I don't know why I was on the higher one. I don't understand. I don't know that I was asked. Maybe there should be something sent to [Age] Pensioners. Be aware that you could be on the wrong plan. Make sure that you are on the right plan for your income.*

Despite being extremely energy conscious with her energy usage at home, Iris had difficulty reading her bill charges and making sense of it, so she "just paid the total amount". Like Iris, Amelia just looked at the amount to be paid, disregarding the energy charges. Notwithstanding his good energy literacy skills and capacity to track and monitor his energy consumption every quarter, Anthony still found it difficult to understand his bills:

In fact, to even read my bill, … I find that to understand the bill is bordering on my limit. Now, I am quite sure that I can find nine people in my street who can't work out what their bill says.

Jessica found it complicated to work out peak/off-peak charges in TOU tariffs:

I find it confusing with all these little numbers and how much for usage and all of those and how they charge, yeah, the kilojoules and all of that... I think they [retailers] should make it clearer for older people and put it in words rather… For them to understand it better. [Like] if you have a shower around mid-morning, it will cost you more than what it would after seven o'clock at night or something. Because of the peak hours, the peak times. I don't think they do look after you in that way.

Rose only realised she was paying too much because she could compare her bill with the one she received at her previous dwelling. However, she had no idea how to read the bills.

To be honest, I don't know how to do it [read the bills] … I am not into figures. But how I knew I am paying too much was you know, when I had a bigger house I was paying less in electricity. It's only a one-bedroom place and I just moved in. Why am I paying this much? You know, they should educate people about how different providers calculate things.

Other interviewees, like Bill and Gloria, had difficulty in understanding the different types of charges for usage and what the supply charge was for.

Bill: It should be fair straightaway to work out your bill. I've done it with the computer and the calculator… and it is very difficult, very difficult – that they charge you if you use this much. A different charge if you use that much, and then they give you a rebate, and service fee and all that… If we do notice that there has been a very sharp rise, we check whether will it be energy usage or the service [charge].
Gloria: … which is non-existent.
Bill: Yeah, that's right… We often debate… wonder what service? Where is it going on? You know what I mean… We keep asking ourselves, "What is this service? Are they considering service when they send the bill?"

Adam (63 years old, homeowner) lived with his partner and a dependent child in Southwestern Sydney, and his household's average daily electricity usage during summer was 5.18kWh, equalling 466 kWh after a period of 90 days. According to the graph provided in the bill, his family of three was consuming much less than the average 1-person home in his area (693 kWh). Although Adam could understand his bills, he had difficulty making sense of the energy consumption comparison between households. He found the comparison unhelpful, because if a 1-person household was using nearly 50% more energy than his family household of three, it was very likely that their income and energy patterns were not comparable:

There's a comparison there. That's good comparison, but whether it reflects how we use our energy, it's not real. It's not practical to me. Yes, I can't use that information, because how am I…. The average person… one person uses [over] 600 [kWh] compared to… but you know, what does the average person do? So I don't really understand how this has a meaning.

An ability to read the bills, understand the charges, compare energy offers and engage with other retailers is potentially extremely advantageous. This capacity had allowed two interviewees to pay the lowest fees for their energy costs. Diana was able to find a cheaper supplier:

But I do remember my electricity bills [were] much higher than they are now when I went over to Alinta [current retailer]. There was quite a distinct change in my bills. My bills were way up into the high $200's like $279 - less the government rebate, say $60, so that brings it to say $229. Then pay on time discount, they take another $30 bucks off... I was really still paying, you know, $190 something... You see, currently last bill was around $114.00 [Sept 2020]. After discounts, you see, now I'm only paying $90ish or $104. That's quite a big difference, isn't it? And my usage hadn't changed that much. … My daily routines, when I changed over to Alinta, had been the same as they had been when I changed from Origin [previous retailer]. Origin's charges were much higher…

However, she mentioned speaking to neighbours and how difficult it was for them to change supplier and obtain a cheaper rate. It would appear that cultural capital was a factor.

Reading and understanding an energy bill could be considered a challenge for many folks. … I have spoken with one or two neighbours here about their electricity bills and I did find that [when I asked], "Do you know how much you pay?" And they said, "No". And I said, "Well, can I ask you, why you don't read your bill?" [They responded], "Well what would I want to read it for?" It's almost as if they are frightened of it somehow. There is a fear. And I also think it might possibly be because I can understand that bill quite easily. So, I don't have a problem. But most of these people here, God bless them, have minimal educational levels with low cognitive abilities. And with all due respect, even if they could sort out better deals for themselves, they haven't educated themselves enough over the years or developed ways of doing so. As a result, they don't bother to read their bills. They just get a bill and they pay it when they can.

Daniel also made sure he was always on the best possible offer—the most efficient economic-energy capital exchange—so that he would not have to restrict so much on his usage, a rare thought among older low-income households:

I sort of look at the energy plan or the electricity plan that I am on and try and make sure I am on the best available rate, so that means I can perhaps use more or I can use the electricity I need, but I get… If I am paying a lower usage rate, then effectively if I am spending $100, if I am paying a lower usage rate then I will get more kilowatt-hours

for that lower usage rate. So, you know… trying to get the cheapest plan and making sure the bill is as low as possible.

7.1.2 Energy literacy and the confusopoly of the energy market

Even for those interviewees who had some level of energy literacy, one of the main reasons for not engaging or not wanting to engage with the market is the way the current energy market is designed, or, as one interviewee expressed, the "Australian energy confusopoly". Charles captured the feelings of most of the interviewees:

Oh, yeah. Because with this mob [referring to the energy retailers] … if you don't pay it on the day, they charge you extra. They don't give you the discount, which is a lot of crap. And then they go and say, "If you join AGL now, we'll give you $150 in free credits" … And I think, "Why don't just lower the price, will ya?"… I mean, this is what happened years ago. You got charged so much - You just paid a fee. Now it's all this nonsense. It's like, confuse the customer. Confuse the customer so he doesn't know what's going on.

The confusopoly concept was defined by Scott Adams (1997, p. 159) when trying to imagine the marketing of the future: "a group of companies with similar products who intentionally confuse customers instead of competing on price". His argument was that companies would use the complexities of life as an economic and behavioural tool to intentionally confuse customers so that they could not tell which one had the lowest prices because of complex pricing models and incomparable offers, reducing the competition between retailers (Kalaycı, 2015). It is also an issue of bad "choice architecture", as in the conditions under which people have to make decisions that are intentionally biased and designed towards an specific outcome (Selinger & Whyte, 2011; Thaler et al., 2013). The current Australian energy sector is a perfect example of a confusopoly, as the following excerpts portray the confusion interviewees experienced when trying to search for an energy offer.

Because what they [energy retailers] do is… The put these packages together. You can't compare [them]. It's like comparing apples and oranges. They make it hard for you [to compare offers] … [And about the comparison websites] I just found it wasn't a simple site. To me, I wanted to go on and say, "Well, what's the cheapest, huh?" But it didn't say that. It's absolutely useless. So, as I say, we are being screwed. I've been conned every day. (Charles)

Besides recognising that the government and third-party comparison websites could be ineffective in providing useful recommendations, because retailers apply different price models that make it extremely difficult for customers to compare offers, Charles also had the

impression that if he changed his energy retailer through the comparison website, there would be hidden costs involved, which he was not inclined to pay. Anthony shared Charles's feeling in regards to the inability of comparing offers between retailers and had his own Excel spreadsheet to track his energy consumption and energy charges applied by his retailer:

> *I think that the average consumer just glazes over. Okay, so you then go to the shopping centre where all the power companies turn up every couple of months or every year to try and attract new customers, for people to jump ship. And they will tell the customer that they are getting a 26% discount. What the customer never understands is what the discount is off. The customer is clueless unless they have all the data in front of them and a documented proposal from two different companies, right. Unless you take your profile's unit rates and do a pretty thorough analysis, you are clueless as to which one is the best. The first impression may not be the cheapest.*

In other situations, interviewees' frustrations resembled the paradox of choice (Schwartz, 2004)—when the wide range of choices ends up causing stress and anxiety to customers instead of empowerment and autonomy. In general, each retailer will have an average of three energy plans to choose from, and, for some locations, there might be over 15 retailers to choose from, totalling at least 45 potential offers. For older households who were used to the previous government-owned energy system, this can be overwhelming. Amelia, for example, did not perceive any benefits after privatisation and was dissatisfied with the government's position of not interfering in retailers' prices:

> *I just think the … whole system is wrong since privatisation… And also the government really annoys me because they keep saying they're going to do something about energy costs. And they never do. It's really simple. It's actually really simple. One, low basic price, not all these confusing, special offers.*

Anna and Jasmine (53 years old, social housing tenant) felt that besides being confusing, the energy offers were misleading.

> *I'm beginning to think the comparison/competition idea is over-rated. I think that's how electricity comparison works. We put our prices higher so we can offer great sounding discounts – "Pay on time, get 30% off!" Then if you muck up by one day, we get the full high price, plus often a late payment fee on top! … Just in our society of wanting to feel special (I got a 30% discount!!) we don't look at the whole picture. (Anna)*

> *Like I have got some friends that change here and there all the time. But I couldn't be bothered. It's all just too hard because at the end of the day they [the retailers] are all pretty close to each other anyway. That's what I think anyway. I don't know. (Jasmine)*

Drawing on in-depth interviews with 21 older households in Birmingham (UK), Day and Hitchings (2009) reached a similar conclusion: among older consumers, there is scepticism about the benefits of switching energy retailers and the process can be complex and confusing. Anthony emphasised the point that small households have very little bargaining power (i.e., symbolic capital) to really get an advantage from switching retailers and getting better offers. The cost-benefit of "jumping and change" was not sufficient for him, as it was too time consuming:

> *Life is too short; I don't have time to chase up all those things. … If you are someone like the local council and pay a million-dollar electricity bill a year. Yep, you can really, you can get excited about the jump and change. But my energy to jump and change is zero.*

Because of the confusopoly mechanisms, it is hard to access the correct information, and interviewees had issues with comparing offers from different retailers because pricing models are different. They viewed searching for better offers as time consuming and stressful. They also found it difficult to communicate with retailers via phone and regretted not having a face-to-face opportunity to discuss their energy bills, as happened in the past. Even language barriers could be a difficult problem to overcome for older Australians, as international customer service centres become the mainstream:

> *I don't understand it [phone calls with the retailer] a lot because I don't understand the people sometimes. I do like face-to-face time, which you don't get a lot of. Because I don't know I'm not being mean but sometimes there is a language difference and you can't understand properly, or they can't understand you as much as I can understand them. And it's not a personal vendetta against anybody. They all need to work, but yeah, I do feel that side of things. It's a language barrier. (Jessica)*

The lack of knowledge about the energy market and how it operates is also related to the habitus of older Australians. The privatisation of the energy system changed the "rules of the game". It required consumers to actively engage with the energy market to pursue better energy rates. However, many of the energy poor households have poor energy literacy and, more predominantly among older households, lack the habitus of engaging with retailers, because this is new to them. They were used to government-owned energy systems that had basic energy tariffs schemes and only required them to pay the bills. As Chester and Elliot (2019, p. 107) emphasise, the assumptions and beliefs around energy in the early 1990s were that

> *[B]ecause electricity is an essential service, State governments should have monopoly ownership and control of operations to guarantee the provision of cheap electricity to their respective populations.*

There was no need to actively seek online and compare energy prices and schemes among many different retailers to get the best rates. After the restructuring and privatisation of the energy system, this has changed significantly towards a belief that privately-owned energy businesses were much more efficient than government energy businesses, and the competitive market itself, rather than governments, should determine the prices (Chester, 2015). Thus, besides energy-poor households misunderstanding "the new rules of the energy game", there is a knowledge imbalance, which also reflects a power imbalance in the system. Older low-income households are "playing the energy game" by its old rules, while energy retailers profit from this "mistake". The habitus of not engaging or not getting involved with the energy system—acquired in the energy field of the early 1990s—is now "counterproductive" in the neoliberal changed circumstances, where the habitus of the "Resource Man" (Strengers, 2014) is now encouraged. More importantly, when governments and energy retailers—those with the most power in the field—choose not to actively address this issue, there is a problem of collective misrecognition, i.e., symbolic violence, that sustains the inequality within and outside the energy field (Bourdieu, 1991).

Furthermore, all these contemporary market mechanisms and rules influence households' capabilities of acquiring the energy literacy needed to improve their chances of acquiring energy capital at affordable prices. Another common reason for not engaging with the energy market was the feeling of distrust and the risk of falling into a scam. Scam fear is justified. In 2020 there were over 200,000 scam reports made to the Australian Competition and Consumer Commission (ACCC, 2021). Phone scams represent half of total scams, and older people are particularly vulnerable: around 14% of scam reports were made by Australians aged 65 years and over, and this age group has the highest amount lost in scams compared to other age groups (nearly AU$38 million in 2020). Charles was particularly annoyed: "Oh, the people phone me up all the time. Oh my gosh, it drives you mad. I say, 'No', always".

Grossmann et al. (2021) have shown in a European study how the general lack of trust contributes to energy poverty, as energy poor households expect public and private systems to work against them, which is seen in Charles's "the devil is in the details" below. He expected to be conned by the retailer.

To be fair there was an energy company [kiosk] at Broadway [mall]. I can't remember what they were called. They wanted to do [the sign up] ... And I said, "Well, give me your card, and I'll have a look". And she said, "No, no, we need to sign you up now". I said, "I'm not signing up now"… As another wonderful phrase, "The devil's in the detail".

This feeling of distrust has the potential to reproduce and perpetuate the situation of energy poverty, as assistance is not sought nor wanted. Despite thinking there could be benefits in hearing retailers' offers, Phoebe was just as suspicious as Charles:

You get people ringing… about electricity things… They really annoy me, and probably some of that annoyance is because I, in the back of my mind, think I probably should be listening to this. I probably should be taking notice. And I'd be saving myself money and things like that. But I can't be bothered, because I almost have that attitude that if they're trying to sell me something, it's always going to be to their advantage, not mine.

Others, like Jasmine, were afraid that by changing energy retailers they would be in a worse situation, especially after hearing stories from friends and neighbours:

My friend, she is with Red Energy. And they, you know, when she is overdue with paying the bill, they ring her up all the time and try and force her to go into a different, you know, a higher rate without her even knowing and changing it and all that. She has a lot of problems with them at times. So, I think I am better off where I am. … That's why I just stay with them. I know where I am at. I'm just worried about change. I don't know what the others would be like, you know what I mean?

For those who had the ability and the patience to engage with the market in search of a better offer, the frequent updates were frustrating. Daniel was annoyed that all his thorough and time-consuming research for a good energy plan came to nought just a month later:

So what I've found is, over the last few weeks or so that a lot of retailers are issuing new plans, so whilst I checked all the plans available about a month ago, they are still coming out with new plans now and they are reducing the prices even further. A lot of new companies are putting cheaper prices, so I think it's something I need to keep looking at. I'm not going to keep looking at it every week. … We don't need to waste our time dealing with electricity issues, you know, because most people want to get on and do other things with their lives rather than deal with electricity, yeah.

Computer literacy and internet access among older Australians is relatively low. The ABS (2018a) estimates that older households (65 years and over) have the lowest proportion of internet users, 55%, while the average for all Australian households is 87%. People aged 65

and over are also among the least digitally included[66] groups in Australia, particularly if they are women, on lower incomes, and with some sort of disability (Malta et al., 2018; Thomas et al., 2017). Computer literacy—an important form of cultural capital in contemporary societies—and digital inclusion are essential to engaging with the online energy market. An inability to select a competitive and suitable plan can contribute to energy poverty.

As Denise stated, many older low-income Australians did not have a computer nor access to the internet at home and this impacted on their ability to engage with retailers. Hence, there is potential for symbolic violence towards the digitally excluded: the online energy market reproduces the inequalities and injustices of the "offline" society by keeping the less privileged excluded from the best energy deals. Anna commented,

> *I know people without computers or smart phones and know how impossible it is to complain unless you have those. Also, how easy it can be to totally confuse older people.*

Sonia, Samantha, Janine, Marisa (70 years old, affordable housing renter), Violet and Jasmine had no computer at home, so they could only contact their retailers by phone. As seen in Section 6.3, contacting retailers' customer services by phone was often time-consuming and stressful. Checking other retailers' offers would require phone calls to each retailer, as opposed to having the opportunity to compare retailers' offers online. Despite having some computer literacy, taking full advantage of the online world can still be a challenge. Adam and Rose experienced problems with online bills, as these frequently ended up in the junk/spam folders, making them to lose pay-on-time discounts. Chloe's (70 years old, affordable housing renter) computer had had a virus and she decided not to access any email with attachments – luckily, she was receiving paper bills. Phoebe also preferred to keep her "old-fashioned habits" and was annoyed by the online movement:

> *I'm fairly old fashioned. So, I get really annoyed when they then, you know, tell me that they want things online and whatever.*

Denise got her bills via email, but was of the view that this was not a common ability among older low-income households in her area.

> *I don't have any problem with getting my bills. I'm lucky. I get them emailed directly from Alinta. And I can go online, straight to Alinta, into my account to make sure my*

[66] Digital inclusion refers to one's ability to make full use of digital technologies towards "social and economic participation: using online and mobile technologies to improve skills, enhance quality of life, educate, and promote wellbeing across the whole of society" (Thomas et al., 2017, p. 7).

latest payment has been received. I did double check yesterday, and I don't owe anything. So, that's good.

[There] was Compare the Market... It was an advert on the TV, encouraging people… which I think was great. But they had an ad on TV to encourage people to go and have a look [online]. But of course, people who live here, few are computer literate, so how will they get the information to compare? As a consequence, they never learn how to read their bills properly. So, there's no learning process going on, which is a great pity for their sake really into the future.

Some of the elderly people here don't know how to use a computer. That is a big one and some of them are 15 years younger than I am [she was 77 years old]. Sadly, they don't have the capabilities of cognitive or learned ability to deal with internet banking. I couldn't do without it.

It was evident from the interviews that those with good computer literacy skills and decent access to the internet had greater capability and opportunities to engage with the energy market, keep up to date about energy-related subjects, and search for better and suitable deals, positively affecting their energy literacy skills. Bill, for example, used to keep an eye on his online retailer account to monitor his energy usage. Daniel relied entirely on his computer and the internet to make sure he was on the best possible energy contract. He knew what retailers could or could not do with his contract and realised not all retailers provided the same information consistently. Asked where he obtained his information, he responded:

Via the internet and via the ombudsman's website. Via other retailers. I find information about smart meters from other retailers whereas my retailer doesn't have very much information. It's only the electricity regulation department, the AER. They have lots of information about the legislations for retailers. What retailers are supposed to go by.

7.2 Social ties and energy poverty

Studies have shown how social ties with family, friends, agencies and other institutions, i.e., a person's social capital, can impact on people's capacity to access energy services and cope with energy poverty (Middlemiss et al., 2019; Stojilovska, 2021). The issue, however, remains under-researched in Australia. Willand and Horne (2018) have identified how energy injustice can be experienced in different levels of social relationships (intra-households, household-energy retailer relations, immediate social networks and wider social relations). Their study, focused on older homeowners near Melbourne, found that older low-income households' susceptibility to unethical marketing practices created a power imbalance with

retailers, which often resulted in distrust and weariness (as seen in previous sections). Conversely, strong immediate social networks (particularly with family) could be helpful in achieving energy assistance and equity (Willand & Horne, 2018).

Grenade and Boldy (2008) have explored a variety of factors that contribute to loneliness among older people. These factors include widowhood, no (surviving) children, lone person households, and deteriorating mental and physical health. Such factors can contribute to lower levels of bonding and bridging social capital (Putnam, 2000), and, as conceptualised by Cotterell et al. (2018), result in four levels of social isolation: individual, relationship, community, and societal. Morris and Verdasco (2020) found that housing tenure plays a pivotal role in loneliness among older people in Sydney: older private renters experienced loneliness in greater numbers than social housing tenants. High accommodation costs, housing insecurity, and the dwelling location (less expensive rented dwellings are usually more distant from the centre) result in poor mental health, and inability to partake in social activities and sustain social ties or develop new ones. Adding to that, the AHCD analysis showed that more older renters (18%) had reservations when it comes to receiving guests at home, which can reduce loneliness, than outright homeowners (4%), possibly due to the overall condition and quality of their homes.

This section examines how the lack of social capital, reflected in the social exclusion faced by many older low-income Australians, contributes to energy poverty[67]. The real and symbolic loneliness faced by interviewees who could not or did not want to admit their energy poverty situation to friends and families, the feelings of stigma and shame when asking for help, the humiliation experienced when trying to seek assistance, the lack of a social support network and the lack of accessibility and connection with amenities, communities and charities often prevented them from getting the help they needed, be it financial or not.

Because of their limited computer literacy and issues of trust with impersonal (online and telephone) customer services, many interviewees relied entirely on face-to-face word-of-mouth trustworthy advice. When having access to that, it was evident they had more energy literacy and were more informed about their energy options. Social isolation due to lack of

[67] Because of the social isolation they faced, it was even difficult to recruit other interviewees through the snow-balling technique. Their low social capital meant their acquaintances circle was quite small, and as will be explored in the next chapter, energy poverty can also contribute to further isolation.

connection with the surrounding community prevented those few opportunities to happen. In many cases, they were completely unaware of governmental services and concessions that could help them with their energy poverty situation.

7.2.1 Energy poverty accentuated by having negligible social capital

As seen in Chapter 3, social capital depends on the volume and the types of capital possessed by one's connections and also on the willingness of those connections to use their capital on someone's behalf (Dillon, 2019). In many cases, low-income older households had no friends or family to ask for help with their energy bills (and other issues as well), revealing very low levels of social capital. When they did have close relatives, the relatives were often in a precarious situation too and could not help. There was no one Sonia could ask for assistance:

> *Once, my brother helped me once [with the energy bills]. And he is struggling himself. I don't have anyone to ask really.*

Daniel was in a similar situation. His mother was energy poor too and could not help:

> *No, it's just that my mother is the only family that I have got, and she is 84 years old, and she had difficulties paying her own electricity bills. So, there's no use asking her for assistance because that she had difficulty paying her own.*

The kind of support that older households could potentially receive from their social network is not only financial. It could be advocating on their behalf, or, for example, taking advantage of someone's cultural capital to perhaps obtain a better deal. Megan (homeowner) was 93 years old and when she lost her husband, she felt very alone. Her daughters did not live in Sydney, and she could no longer go to places as she was no longer able to drive and faced mobility issues. Therefore, she would spend all of her time at home, which increased her energy consumption. Although she did not face an energy poverty situation, she was very careful about her expenses and use of energy. When I shared with her some information on how to reduce her energy costs, she mentioned she could not rely on her children:

> *Interviewer: Maybe your children can help… I can send you this [the info on retailers offers] by email. And then you can send this to your children... And they can see whether you can have a better energy deal or not.*
>
> *Megan: They are so busy… If they have to read all this, they won't do it.*

Rose was in a similar situation. Her children lived overseas. She struggled with understanding her energy bills and she resented not having her children around to advocate for her.

> *I just want to understand how they calculate it [the energy costs], especially for us elderly. And you know, my kids live overseas. Other elderly people I know, their kids are around, you know. Their kids speak for them on the phone about [the energy issues] … but I do everything by myself.*

She felt she was being misled by her energy retailer, but had no one to ask for help:

> *They [energy retailer] don't walk their talk. They do that to entice you to sign up with them, and then they don't care about you as long as they can see, "Oh look, she is paying her bills, so she's alright". But she can really save on this and that. But they won't explain that. They want your money. And let other people take care of it. And how do we find out how to take care of it? Number one, my kids aren't here to simplify things for me.*

On the other hand, having a frequent social connection with children and relatives has meant that Amelia has been able to reduce her energy costs by spending one day a week out of her home:

> *It's sort of one of the things that helps me with my bills is that probably for the last few years, I've been spending one night a week at my daughter and son-in-law's place. Basically, you know, helping with the children or babysitting. So that's usually been one night a week, that has dropped off a bit lately [because of COVID]. And the other thing is… Like two years ago, I had five weeks away from home. And last year, my brother-in-law owns cabins, so we go for at least two weeks during the year away to his cabins. So again, you know, that's a great saving in my home costs, my home energy costs.*

Most of the interviewees felt embarrassed or ashamed of asking for help and abstained from speaking to their family or friends or seeking assistance from charities about their energy hardship situation. It is likely that their intention to preserve their reputation and honour (their symbolic capital) by not opening up about their energy poverty, would reduce their chances of relying on their social capital to receive assistance. A similar conclusion was reached by Longhurst and Hargreaves (2019). They found that feelings of embarrassment prevented households from improving their energy poverty situation. In my own research, Jessica felt uncomfortable receiving money from her daughter: "You can give them the world, but you hate taking. Put it that way. You can give, but you can't receive". Violet had a similar feeling when she had to approach her son for help with a high energy bill:

Sometimes, if I get really, really in a bad way, I will ask my son to borrow the money and he never questions. He just says, "Yes, mum, no problem". But I still feel really guilty and I cry every night when I have to. I put the money back in his account … I pay him back, but I feel so guilty because you shouldn't be doing that you know, but sometimes if the bill is higher than usual, I don't have that money. I try to put money aside, but it's just not enough for everything.

Interviewees preferred not to admit to others (and sometimes to themselves) that they were not coping. When asked whether she had approached her family for help with her bills, Amelia was direct:

No, I never do… Family and friends have offered to help in general. But, you know, I don't want to [ask]. I suppose pride. I don't want to admit that I'm not coping. I would ask if I was desperate … I don't want to add to their stresses.

Rose commented that asking their children for help was seen as taboo and culturally unacceptable, suggesting that her cultural background played an important part in what her symbolic capital and sense of value was. When she had to borrow money, she preferred to go for a No-Interest Loans Scheme (NILS) than to admit to her kids she needed help:

Oh, reaching [out to] my children? I don't think anyone does that. Oh no, it's a taboo thing. … So, I've never asked for help from my children, even if at some point I needed money for example. And a lot of it is pride as well. Because even when I had, when I was in dire straits, I borrowed money from a community centre, you know the NILS program. … I would rather borrow from a bank or the government or other services … I became so self-reliant and you know I never expected to be waited on, to be getting handouts or something like that. I would feel embarrassed.

Strong social relations especially with neighbours can be beneficial. For some interviewees having someone to talk to about their bills and compare costs was an initial trigger to seek help with changing energy plans or retailers. As Violet explains below, discussing energy use with "real people" meant she could relate more easily to energy users and get better advice. Her comments on the undesired international customer service calls also corroborate the trust issue identified in the previous section.

I think by talking to the people around me, because they will tell you how much their bill was and what they use. And personally, I like to hear it that way best of all because they are real people. They are using the energy and they will tell you how they use the energy, how much they are paying, and then I can say, "Okay. I know I use my energy the same way and I know my energy is lower". These people that keep phoning all the time from Bangladesh, I mean … why are you calling me? I don't want to hear about it. I'd rather hear it from a live person to tell me what they do, how they are doing it.

Reduced social capital in Australian regional areas have been investigated previously, and older households are among the most vulnerable (Stanley et al., 2019). Despite his computer skills and high level of energy literacy, Daniel still felt socially isolated with respect to social support services while living in regional NSW:

> *But it's in a regional area, so it doesn't have very good access to social and support services. Say in Sydney, there is a lot more access to assistance. And also, things like education and all that sort of stuff, which is not available locally.*

A recurrent point made by interviewees was that many would still go to the nearest Australia Post to pay their energy bills. Besides low computer literacy and fear of online scams, it is likely that paying their bills in person, and usually with the same cashier, increased their trust and perhaps improved social capital.

7.2.2 Approaching charities for assistance

Some interviewees found dealing with energy retailers extremely difficult and approached charities for assistance. Some charities have been approved by the NSW state government to assess EAPA applications. No demographic information is collected from EAPA vouchers' recipients, but studies from NCOSS (2017) indicated that almost half of the population NCOSS surveyed did not know that EAPA vouchers existed and one in seven believed they could not get EAPA vouchers, even though they are theoretically available to anyone who is unable to pay their bills. The interviews substantiated these findings, and it is likely that the proportion of Age Pensioners that apply for the voucher is much lower than other age groups, making their energy poverty situation difficult to assess not only through surveys (as outlined in Chapter 5) but also among charities and third-party institutions. Interviewees were reluctant to approach charities for assistance, particularly if help was needed frequently, as Daniel admitted below.

> *And also, the EAPA vouchers are not meant as a continuing sort of method of support, you know, to pay the electricity bill. They are meant to be a one-off sort of situation where you have a crisis, they will help. But you know, you are not meant to turn up every three months and say, "Oh, I can't pay the electricity bill". And that's what was happening for me. I had experienced homelessness and all of that, so I had a reasonable reason to be asking for assistance. It wasn't sort of an everyday situation. But still, the charities… they do have limits on how much they can assist. And it is embarrassing when you ask for that assistance and they say, "Oh no, you know. We can't help you anymore." … I didn't really feel good, having to go to charities… and feeling like you are doing wrong asking them for help.*

Overcoming embarrassment and shame proved beneficial for those interviewees who approached charities to get help with their bill. Sonia, who struggled with an excessive estimated bill after moving house, approached a charity organisation nearby and luckily received excellent assistance. The counsellor acted on her behalf and called the provider to change energy plans. This situation exemplifies the potential importance of social capital in reducing energy costs and alleviating energy poverty:

> *I went to a Salvation Army counsellor. She rang them, because when she looked at it [the bill], she saw that I was on a very high rate. And I don't know why I was on a very [rate]… I wasn't asked to go on a very high rate … So I didn't realise that I was on the wrong rate. So, she got them to put the rate down. So, what happened after that talk with the counsellor, this last bill, I nearly died of delight. It was only $200 [the previous bill was around $700].*

Other interviewees shared that getting assistance with their bills from government or charities could be bureaucratic and involved a lot of forms and paperwork, which discouraged them from applying. Despite receiving much appreciated help from Salvation Army on the abovementioned occasion, Sonia had previously approached other charities for EAPA vouchers and was left nonplussed when they told her they had ran out of vouchers. She suggested that assistance should be simplified to avoid embarrassment:

> *Well, the state government should make it so that you don't have to go around begging to the charities. It should be understood that [Age] Pensioners on a private rental have it difficult. And maybe it should be a situation where you do get more rebate from the state government. It should be looked at. It should be seen that these bills are high … Rent is bloody high. [The government] … should make sure that the electricity is affordable and payable. And we shouldn't have to go around begging to charities … Salvation Army ran out of vouchers. I had no help from them at all. It took me the whole quarter, into the next to pay it off myself, $50, $70 a fortnight. It was a drain on the amount of money left over for living expenses.*

7.3 Energy poverty – the role of gender

There is a gender factor in energy poverty, especially among older women (Clancy et al., 2017; Petrova & Simcock, 2019; Robinson, 2019). Because of the traditional gender roles in marriage in previous decades, the greater likelihood of women to move in and out of paid work to care for family members, and the gender pay gap (WGEA, 2021), women tend to retire

with significantly less savings. The Australian gender retirement superannuation gap is on average 52.8% - reaching over 75% for older groups (WGEA, 2017).

The HILDA report (Wilkins et al., 2020) indicates that poverty persistence is high among single older women: between the 10-year period from 2001 to 2010, 29% of older women were in poverty in seven or more years. Iris, an Asian immigrant, was financially dependent on her Australian husband, and after he lost the business and died, she had to adjust her lifestyle completely. Part of the adjustment involved cutting her energy costs.

> *Yes, my hubby died in 2008. That's why I had to move here [affordable rent retirement unit]. We used to live in Surfers Paradise. We had a beautiful house. But because my husband lost the business, everything… Then he became very ill. He couldn't get back to it [to the business]. It was so difficult.*

Anna revealed that her abusive relationship pushed her into arrears with her energy retailer.

> *I left my abusive ex-partner in my house whilst I started housesitting. … A bill got overdue but not excessively so. He wanted me to pay for his electricity usage whilst I wasn't even there.*

Violet experienced abusive relationships with her father and ex-husband that ultimately left her homeless and financially vulnerable.

> *Yeah, that's how desperate I was to get out of the house because I knew he [her father] would kill me eventually. So, when I left my house, my husband was really good at the beginning. It's just later on he started taking … these drugs. He became stupid and yelling. And he started choking me and smacking me. And you know, I'd had that all my life and I just wouldn't [tolerate] … it and so I just ran away.*

It was also evident from the interviews that women were less interested in energy-related matters than men. Gloria, for example, would rely entirely on her partner Bill to get information on energy-related matters, acknowledging that she could "play it safe", because he had worked in electrical trade. Rose believed her cultural background established specific roles in the household. She had difficulty understanding the energy bills and was too overwhelmed to work it out:

> *I don't understand how many watts it should be, you know, whatever. I will go into overwhelm mode and so, I will put it aside. There is a point in my life where I will just put things aside… when I became single again. Because you know, my late husband used to handle all the money side of things … I think most females don't have like a mathematical brain …. I'm good at school for other things, literature, languages, and*

> *all that, but not numbers. Yeah, so if I don't get any resolution from them [energy retailer], I am going to go see one of my younger friends whose husband, I mean even the younger ones don't look at the electricity bill because it's their husbands who look at things like that, you know what I mean, especially in my culture.*

Mary's husband dealt with the household finances, which included the energy bills. After his death, she was confused about her energy bills and having to deal with it alone. The language barrier imposed additional challenges to her improving her energy literacy.

> *I'm not sure, I don't know [how to read the bills] … because, you know, this stuff and all these things… my husband used to do it… I never [did]… The problem is that he passed away, you know… So this way now I'm alone… and now I have to live only with the pension and it's come to shrink [the income], yes… even now I'm sick…*

From the excerpts above, it is evident that the overlap and combination of numerous disadvantages and vulnerable life circumstances often affect women in more ways than men (see Crenshaw, 1991; Grossmann & Kahlheber, 2018). Recurrent accounts of unfortunate life events experienced by female interviewees, such as becoming unemployed at an advanced age, quitting a job to care for a family member, overcoming or escaping abusive relationships, being widowed, developing mental and physical health issues and/or disability problems, resulted in a much lower income situation and either pushed them into or accentuated their energy poverty.

The overlap of numerous vulnerabilities, resulting in lower levels of all types of capital, severely restricted the capabilities of female Age Pensioners with respect to acquiring adequate levels of energy capital. Hence, just like the ideal smart energy consumer of the "Resource Man" from Strengers (2014), there is the other end of the spectrum: the "Unresourceful Senior Woman". The Resource Man encapsulates the idea of the enormous symbolic capital possessed by wealthy, well-educated and resourceful men. In her words (Strengers, 2013, pp. 34–35):

> *He is imagined in the image of his utopian masterminds – engineers, economists and behavioural scientists – and is positioned as an efficient and well-informed micro-resource manager who exercises control and choice over his consumption and energy options. In this way, Resource Man embodies technique in all his actions, by choosing a range of technological and data-mediated tools to suit his unique lifestyle.*

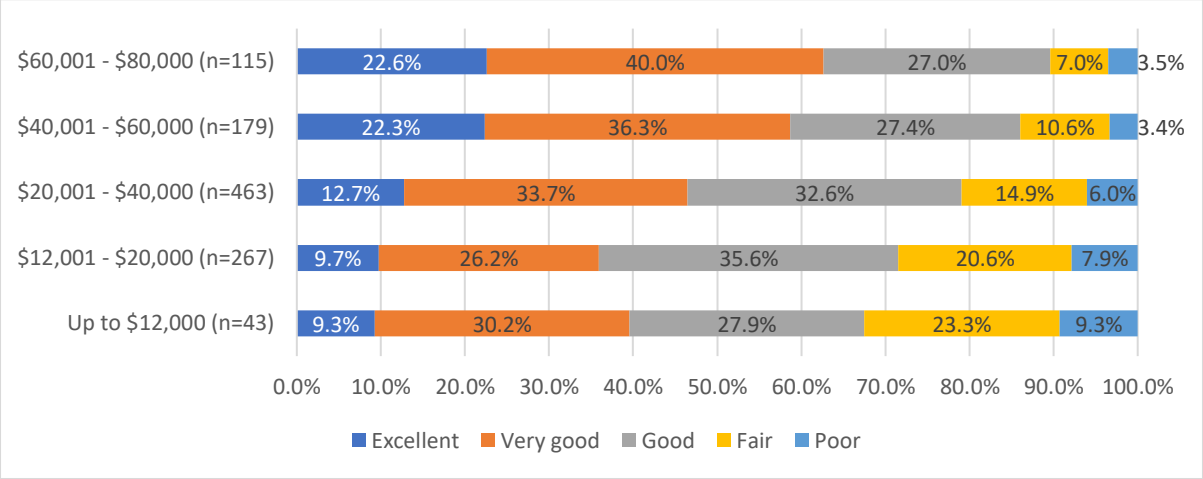
The Unresourceful Senior Woman could not be more diametrically opposed to that conceptualisation. Lower levels of economic, cultural, social and symbolic capitals undoubtedly affect their capacity to acquire energy capital. Among the interviewees there were exceptions.

Denise was a good example of a Resourceful Senior Woman who, despite low levels of economic capital (which certainly influenced her energy use consumption and costs), had very high levels of social and cultural capital. The latter enabled her to engage with the energy market (online and offline) to get a discounted energy plan with cheaper rates.

7.4 Health related energy use increase and other issues that prevent active engagement

The AHCD data indicates that the lower the income of older Australians, the poorer they considered their health, as Figure 7.1 illustrates. As those primarily reliant on the Age Pension tend to be in the lower income brackets, the data shows that 23% of Age Pensioners considered their health fair or poor, as opposed to 11.9% of superannuants. In general, Age Pensioners thought less positively about their health than superannuants.

Figure 7.1 - Self-assessed health by annual household gross income level



(Source: the author using the dataset from Baker et al., 2019)

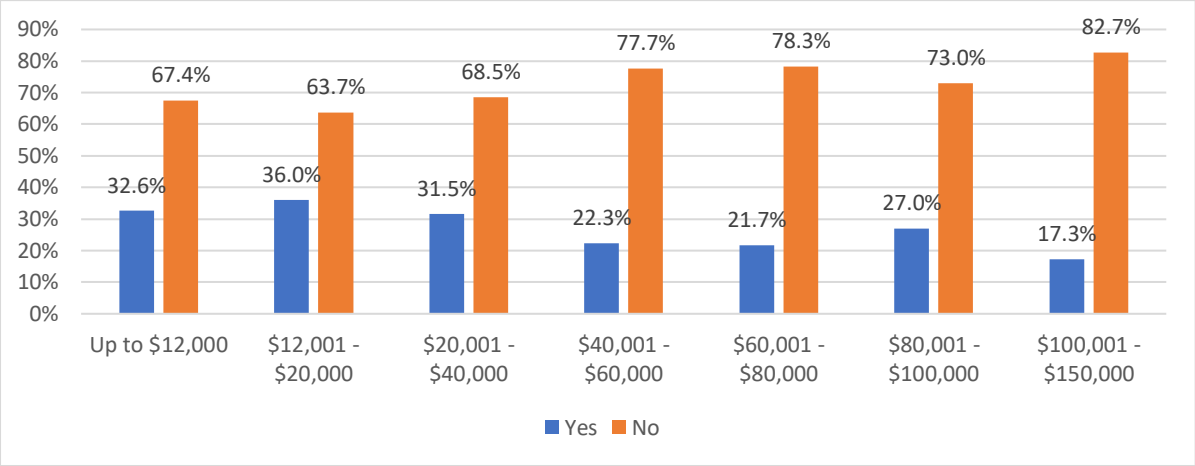
As people age, particular health requirements might result in greater household energy needs and costs (White & Sintov, 2020b). For example, studies have shown that older people are more sensitive to temperature extremes, due to their reduced capacity to regulate body temperature (Kenny et al., 2010; van Hoof et al., 2017). Like Violet, who realised that she had become more sensitive to the cold over time, Denise, who was already 77 years old by the time of the interview, imagined her energy usage would increase in the coming years:

> *I mean when I get old[er] and I can't do anything very much. Horrors 24/7 or lying [in bed] there 24/7. That might be a bit different then. Well in the sense that if it's winter I*

might have that warm electric blanket on. I've got an electric throw. I might have to have that on a bit more. You know, I haven't even used that electric throw yet.

The lower the income of older Australians, the more present were the health conditions that restricted their daily activities. As seen in Figure 7.2, over 30% of those on incomes lower than $40,000/year had a condition, impairment or disability that restricted their daily routines, while this was the case for around 20% of those on higher incomes. As their income level is directly associated with the main source of income, 34% of Age Pensioners had a condition that restricted daily activity, as opposed to 22% of superannuants.

Figure 7.2 - Restricting health condition by income level



(Source: the author using the dataset from Baker et al., 2019)

Charles was a carer for his wife, who had dementia, urine and bowel incontinency. Besides having the TV on all day (13-15 hours per day) every day for her to get distracted, he needed to wash all clothing in hot water for disinfection purposes:

I have a heater in my washing machine too. Well, I mean, my wife is not only urine but bowel incontinent too. So we need a hot wash to disinfect everything… I wash and I wash and I wash… (laughs) I'm just saying because the electricity I suppose… A lot of the electricity is used on the heater in the washing machine, which I'd like to cut down, but I can't … Sometimes I'll do three washes, three washes in one day… in different cycles.

Daniel had a similar problem that meant that he spent more time at home and the washing machine was used extensively:

Well over the last year or two, [I've] certainly increased the use of the washing machine. I am a bit unwell at the moment and so I use the washing machine a lot more than what I would because I have to wash everything a lot more often. It's mostly warm washes. But sometimes I use hot [water] to disinfect my towels and sheets and things like that

… Every second day I have to wash a load of towels and sheets every week. So you know, certainly… because I am a bit unwell, I am certainly using a bit more of the washing machine. And I certainly spend a fair bit of time at home.

Other common physical issues related to high blood pressure, arthritis, heart and lung conditions, and chronic fatigue syndrome meant some interviewees were more sensitive to temperature differences and, therefore, had a greater need for cooling or heating purposes.

I have chronic fatigue syndrome - I don't make enough energy to run my body so I'm permanently tired, can't sleep, get unrefreshing sleep. Thing is, I feel the cold dreadfully. (Anna)

I'm very sensitive to temperature differences. I get hot very quickly, I get cold very quickly. If I sit down, I'm freezing. I'm on top of the heater. And also, the other thing that adds to this, is that two years ago I had pneumonia. And the one symptom which is very typical, is that you get chills, you get extreme chills, and there's nothing you can do about it and your hands are shaking with the cold. And I really remember that, so I like to keep warm or I like to keep cool. So I don't really restrict [the energy use] myself. And that then gives me a problem that I often can't pay my bills on time. (Amelia)

Samantha had polymyalgia rheumatica[68], and besides increasing her heating/cooling needs, she also had to use the electric blanket and the microwave more often for pain management.

As I'm older and I've had health problems [she has a heart condition and breathing problems], I do feel the heat and the cold more. I developed something called polymyalgia rheumatica where the body sort of stops functioning and can't move … Well, I deal with chronic pain all the time. That's why I use the electric blanket. And the other thing I use is those heat pads that you put in the microwave that have got wheat in them. And so, I use that. That's my physical maintenance, and I can't predict when the pain levels get to the point that I can only read or listen to CDs or something. But the heat pads, that and the electric blanket are the way that I manage my pain, for health management. And so that comes and goes. But it's becoming more consistent now that I've been doing it nearly every day particularly if it's colder.

Jessica and Jasmine had health conditions that required an air conditioner installed in their social housing units. They also had the medical cooling rebate[69] in their energy bills, but they still felt their bills were difficult to manage.

[68] Polymyalgia rheumatica is an inflammatory rheumatologic condition characterised clinically by muscle pain and stiffness on shoulders, hip girdle, neck, and torso. Although the cause is unknown, inflammatory conditions can result from a combination of genetic, environmental factors and excessive stress. If untreated, polymyalgia rheumatica may result in significant disability.

[69] The medical cooling rebate in Victoria provides a 17.5% discount on electricity usage and service costs between 1 November and 30 April for eligible card holders who require medical cooling confirmed by a doctor. Not all states have similar concessions. Jessica and Jasmine lived in Victoria.

But because I have a lung condition, I use the air conditioning a lot. I do try to save it, but if I am cold, I will put the heater on and if I am hot I will just put the air conditioning on, because I can't breathe otherwise if it's not on. I can't stand being too hot. No, it's like you're suffocating! (Jessica)

Because I have high blood pressure and anxiety, I don't like summer. I hate it. I have to have medical cooling. So, when I got a place, it had to have an air conditioner. So, I've got an air conditioner in here. I use it a lot in summer, virtually nearly day and night. I mean, especially during the night-time, I use it because I [have] got high blood pressure and I can't stand it. I am one of those people that feel[s] the heat… [And] because I've got osteoporosis and osteoarthritis. So, you know when I get cold, it creates more pains. (Jasmine)

When interviewed, Mary had just returned home after a stay in hospital. She was worried her bills would increase due to her spending more time at home, her special needs in regard to cooking and a greater use of domestic appliances, as she felt too tired to practice previous energy saving habits, such as handwashing dishes.

I have to cook every day … They [the doctors] say I have to be away from the junk food and the frozen food. That way, I prefer to cook [healthier]… Because I'm being sick … I'm thinking I have to use more [energy]… because, you know, I do more washing [the dishwasher and the washing machine] … How do I say, I'm cooking more, I'm washing more, I stay longer here [at home]. You know what? If I stay here and I just sit here without electricity and without watching TV to make economy, it will make me more sick.

Other health related issues that seemed to affect energy consumption and capacity to pay the bills on time included memory loss with advancing age:

Yeah, I mean the other day I left the bloody oven on and nearly killed myself. Oh, geez. You bloody idiot. (laughs) Because I have to have so many things going on at the same time… [gesture of getting crazy] And I left the grill on… How much is that gonna cost me? Here am I trying to save on energy… turning the lights off and I got a bloody grill blowing. (Charles)

I didn't pay [the electricity bill] it [on time]. That's why. One was in August, and the other one was October, or September?... Because sometimes I forget and all this, but in general I try to pay on time, especially because there is a discount. In that case, I lost $17.24 for not paying on time, because I paid $207 and I could have paid $185. And these are the things I do have to be careful [of]. (Lauren)

Lastly, hearing loss can make it difficult for older households to communicate with energy retailers by phone. This was mentioned by a few interviewees. Another point raised by Denise was related to the very small fonts on energy bills:

Some bill fonts and size are very small so this is a "put off" for those with sight challenges. Even I with 3-level progressive lenses for chronic astigmatism (since age 4) need to use a larger font with emails so....an interesting side issue perhaps...

Hearing and sight loss problems can affect people of all ages but there is a strong correlation between those and ageing, due to varied factors including the natural "wear and tear" process (AIHW, 2016). Heine (2017) affirmed that one of the most disabling effects of vision and hearing loss with advancing age is decreased ability to communicate with others. The evidence suggests that existing communication strategies (mostly impersonal - by mail or phone) from energy retailers are not suitable for those with vision and hearing impairment. This further excludes them and reduces their capabilities to engage with the market. For energy retailers to effectively communicate with all clients and avoid symbolic violence, there needs to be a shift in the way information is provided towards more inclusive and personalised strategies, such as face-to-face meetings with communication support services, use of plain English and availability of information (text and audio) in other languages, and large prints.

7.5 The impact of the COVID-19 pandemic on energy poverty

The available data suggests that residential energy consumption increased substantially during the lockdown and many households experienced a steep increase in their energy bills (Bainbridge & Kent, 2020). For some of the older Australians interviewed, the lockdowns drove them into or accentuated their existing energy poverty, due to the increase in time spent at home, higher charges, misinformation and lack of communication with energy retailers, and lower disposable income. Some had bills that were 15% to 50% higher than their bills in 2019 (see Wilkinson et al., 2021 for more details). Iris said prior to COVID she kept her bills low by spending time at her community centre, to avoid using energy at home. It also helped her remaining social and active. In response to COVID, the community centre and the communal area in her building complex closed. Iris had several health issues and was reluctant to go out, even after most of the COVID-related health and safety measures were lifted in the second half of 2020. Her energy bill increased by A$50 to A$60 per quarter:

Before COVID, I used to be extremely social. I'd be outside my home every day. Now I think the increase in my energy costs are being compensated by not going out anymore and not socialising, as I'm still afraid of exposing myself to the virus. I'm old you know. I can't [afford to] get sick. But even though I'm saving some money by not socialising, I

can't save money for potential emergencies as before. With the higher electricity bills and the new medical expenses, my capacity to save [has] reduced a lot.

Anthony changed his lifestyle dramatically in response to COVID. The changes affected his energy consumption and energy costs. Although he was a homeowner and a self-funded retiree (he lived on a $30,000 income per year), he saw his energy consumption practically double during COVID and energy costs accounted for almost 10% of his income.

I went from eating out, every hot meal was eating out. And then from March onwards, every hot meal was eating in … I was out of the house one hour a week in March, April, May and June. I was home 167 hours a week.

His remarkably accurate records revealed that his energy consumption in December 2020 (post-lockdown) was still much higher than his consumption pre-COVID, which highlights what Iris mentioned previously; whilst younger households were able to return to a near pre-COVID lifestyle once lockdown measures were lifted, older people were still reluctant to leave home (as seen in Age UK, 2020; Beyond Blue, 2020) and this ultimately affected their energy use for a longer period. Violet noticed an increase in her energy bills but had difficulty linking her higher bills only to increased consumption.

When this COVID thing is not around, I am out all the time. I am out there talking with people because that is what I do best. I don't stay home, I get around. I talk to people. [Now] what do you do? You are stuck in the house all day. I have to put it on [the heater] … I have to because we are home all day and I can't go anywhere… [But] I think since COVID has come in, everything has gone up, up, up. I don't understand what the bill [says]. Why are they [the energy bills], you know, going up so high? Doesn't make sense to me.

Her energy rates had changed, and she had tried contacting the retailer, however the customer service did not know how to explain the increase in the charges:

No, I phoned them up and I said, "First I want to talk to them and find out why the bill [was] so high". I got a letter before that saying that it's going to go up. I thought fine, $5, $10. I didn't think it would go up any more than that. When I got my bill, when I saw it, it was like $70 up. So, I said, "Why is it up so high when I haven't used it at all?" She said: "Oh, it's COVID". I said, "You can't blame everything on COVID" … You know, they don't know how to explain it, so let's just blame it on the biggest fiasco that's going around.

A similar problem was faced by Bill, who checked his charges prior and during COVID and noticed an increase in both usage and supply rates with no previous contact from the retailer. He had mistakenly heard companies were not changing contracts during COVID:

[The retailer] is using COVID as excuse not to contact you and to reduce assistance to customers… Using COVID to bend the rules and when you challenge them, they come around…

Violet commented on how the increase in essential items such as fruit and vegetables during COVID, meant that she had to choose between what to prioritise and this affected her health:

[COVID] has stuffed everything up. … It's like you go to a shop and it's three times more you're paying for that. And then your phone bills up. And this adds up, so you can't shop properly.

Rose, because of COVID, decided it would be safer for her to drive her car instead of using public transport, and this affected her household budget. Although not in the scope of this study, some previous research has related high petrol use and costs (as in transport poverty) with energy poverty (Mattioli et al., 2017; Simcock et al., 2020):

Since COVID, I have never gone on public transport, I have always driven around. So, then there is the petrol bill as well. I know how much I need to have to be able to use my car to go from place to place. Because I don't want to use the public transport anymore, you know because of this social distancing thing. You may be economising one way there [if using public transport], but then when you get sick, you know what I am saying…

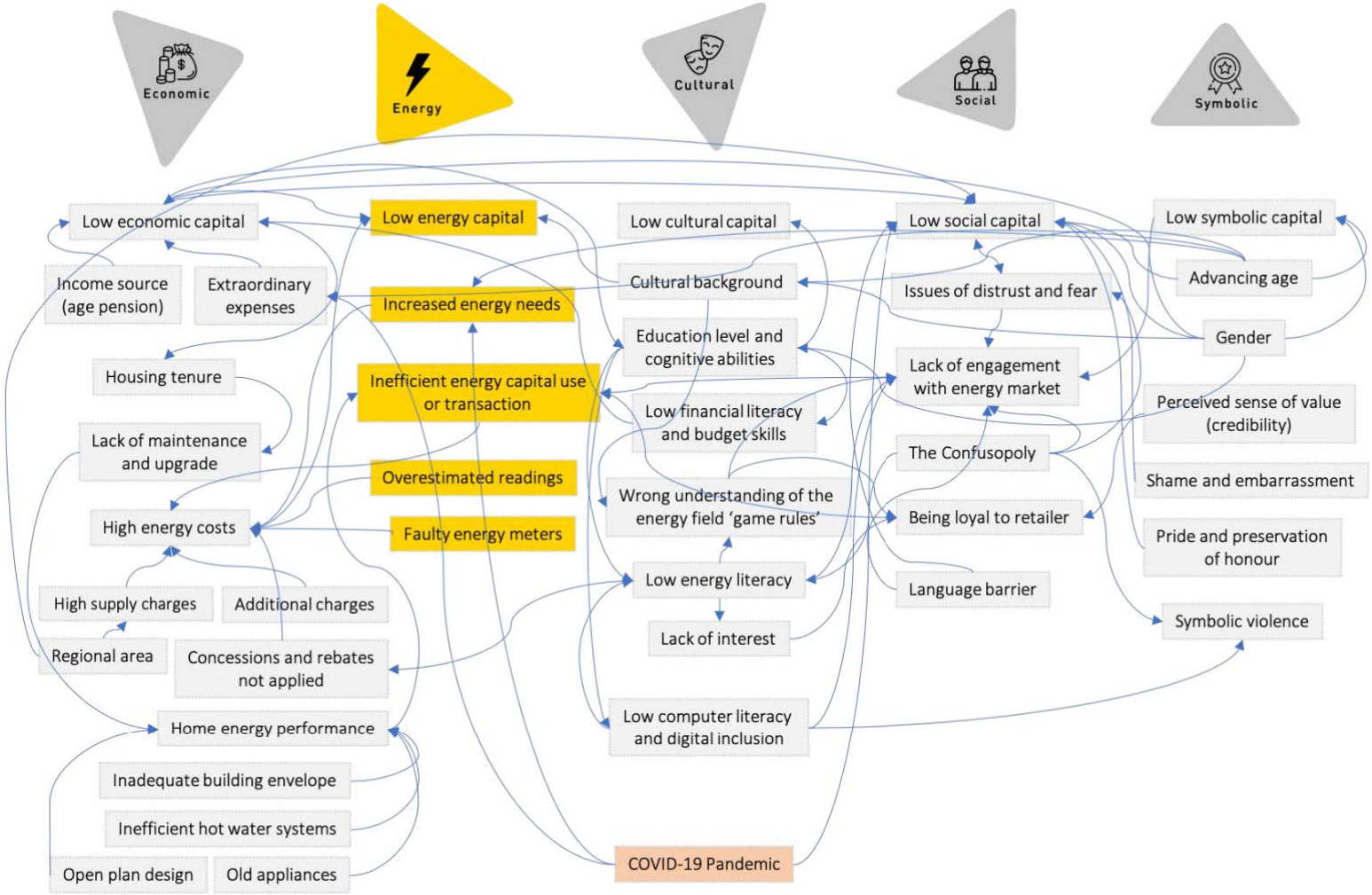
7.6 Conclusions

This chapter, drawing on the in-depth interviews and complementing Chapter 6, explored drivers of energy poverty, other than low economic capital. The interviews showed that the lack of energy literacy and the difficulty in engaging with the energy market, the lack of social capital, the gender factor, and health-related issues are also important to consider. All these drivers relate to one or more types of capital. As anticipated, economic, cultural, social and symbolic factors overlap and influence each other in a very intricate network to contribute to energy poverty. The concept of energy capital relates directly to those other forms of capital and helps to clarify the complex and exchangeable capital relationships. Figure 7.3 is an endeavour to illustrate the energy poverty drivers discussed in Chapters 6 and 7. Although it is not exhaustive, this diagram provides a map for understanding how energy poverty drivers relate to each other and what potential solutions can be put in place to lessen energy poverty.

Besides the issues related to economic capital, it appears that low levels of cultural capital, particularly with respect to the energy field, is also a major contributor to energy poverty among Age Pensioners. Important aspects of energy literacy for seniors are related to understanding energy prices and different tariff types, understanding different offers by retailers, awareness about home appliances using the most power, ability to make informed energy choices about their energy bill (instead of only checking the amount to be paid), and knowledge about how to access information on energy related subjects.

Their difficulty in acquiring the cultural capital required to actively engage in the energy field and the different rules of the energy field since privatisation of the energy market make it intensely challenging for them to seek proper support and assistance. Training on energy literacy would be beneficial and could empower households to make better choices about their energy costs. However, it should be made clear that the responsibility should not lie only with the consumer or, in this case, on the vulnerable consumer. Opportunities to help them with getting better energy offers, proper assistance and energy literacy training could arise from partnerships between the energy retailers, advocacy organisations and the Australia Post, where many older Australians go to pay their energy bills.

Figure 7.3 - Diagram of causes of energy poverty among older Australian Age Pensioners per type of capital



(Source: the author)

I conclude this chapter by highlighting the connection between the energy confusopoly and the lack of energy literacy among older low-income households. The confusopoly and the choice architecture of most retailers is misleading and makes it difficult for older low-income Australians to access optimal energy plans. While neoliberal market ideals state that the free-market competition and minimal government intervention in the economy can promote autonomy, better choices and empowerment to consumers, vulnerable groups with low social, cultural and economic capital have limited agency.

For the majority of vulnerable consumers, the current energy market design is flawed and, in many cases, worsens energy poverty. As Strengers (2014) summarised, current smart technologies and the market are being designed for the "Resource Man", an utopic and very rare type of consumer. In his research—using Bourdieu's theory—to unravel the symbolic violence in Australia's public services, Mulayim (2016, p. 254) concluded,

> *The ideals of individualisation and self-help—key concepts in a neo-liberal approach to public service provision—make it possible to hold people responsible for their misfortune, and are deeply complicit in numerous forms of symbolic violence.*

That is also the case of energy poverty in Australia. Improving energy literacy is important, but it will not solve the problem. It is unethical to make vulnerable households responsible for their "high energy rates" with their lack of knowledge, lack of time, resources and capital to individually and actively engage with their energy retailers to negotiate better offers. The way the Australian energy market operates needs to change dramatically to prevent this form of symbolic violence from happening. In the next chapter, I examine the diverse impacts of energy poverty among older low-income Australians and how energy poverty contributes to reducing their economic, cultural, social and symbolic capital.

Chapter 8 The Impacts of Energy Poverty on Older Australians

Introduction

Having detailed the extent and diverse causes of energy poverty, this chapter[70], drawing on the in-depth interviews, examines the impacts of energy poverty on older low-income Australians. The discussion complements previous studies on the detrimental effects of energy poverty on health and wellbeing (Baudaux et al., 2019; Chard & Walker, 2016; Liddell & Morris, 2010; Longhurst & Hargreaves, 2019; Zhang et al., 2021). It discusses how these impacts relate to the many forms of capital (economic, cultural, social, symbolic, and energy) explained in Chapter 3. In light of the capabilities approach (Sen, 1999), I examine how energy poverty undermines older Australians' abilities, opportunities and freedoms to lead a decent and pleasant life. Evidence is given as to how energy poverty affects many of the central capabilities outlined by Nussbaum (2003).

In Section 8.1, I investigate the impacts of energy poverty on older Australians' health and wellbeing. The high energy costs and the thermal discomfort experienced result in mental and physical health decline. Consequentially, central capabilities of bodily health and integrity, control over one's environment and a life worthy of living are compromised. Next (Section 8.2), I highlight how the unaffordability of energy reduces their economic capital and thereby imperils their capacity to purchase essential items, particularly stressing the connection between energy poverty and food insecurity, but also commenting on the cutbacks on medical expenses, clothing and hygiene products, mobile and internet access, and entertainment/leisure activities, that ultimately impact on their capacity to acquire or sustain social and cultural capital.

As previous research has indicated (Middlemiss et al., 2019), energy poverty and social isolation are intertwined in a vicious and dangerous cycle of disadvantage. Hence, Section 8.3 expands on how energy poverty contributes to lower levels of social and symbolic capital, as social activities within and outside the home are avoided to save some money. Also, situations

[70] The findings in this chapter are partially published in Porto Valente et al. (2021).

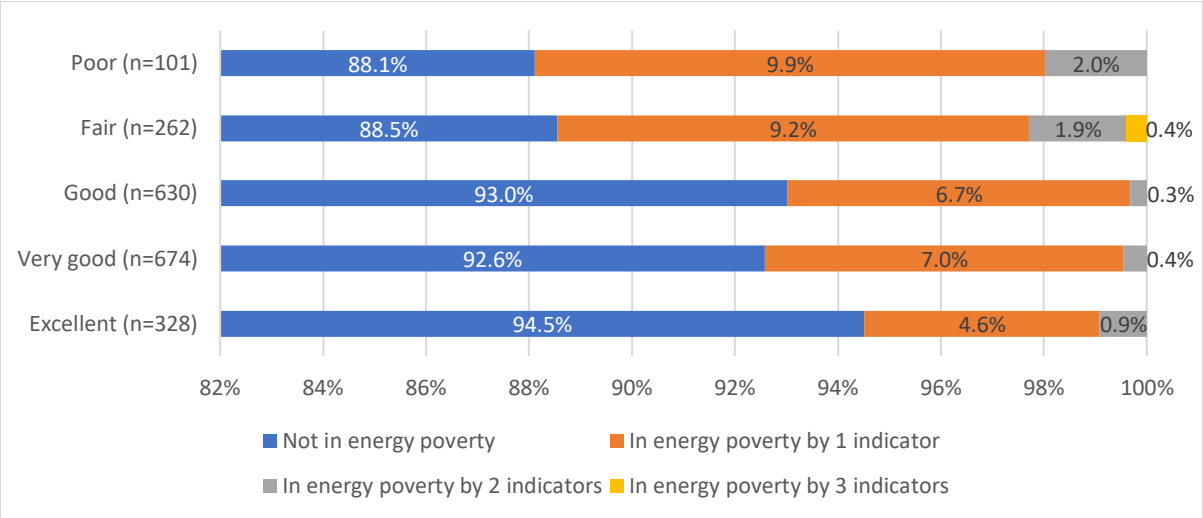
of embarrassment, disrespect and humiliation experienced by energy poor older Australians prevent them from accessing assistance and better energy services.

Section 8.4 explores how the fear of high energy bills affected interviewees' energy use and practices at home to varying degrees, extending beyond Willand and Horne's (2018) discussion of functionings related to heating the home to adequate temperatures. It expands on how low energy capital results in unfulfilled energy-related secondary capabilities that largely affect basic ones (Day et al., 2016). In addition, interviewees' energy consumption patterns were compared to those of an average Australian household. The chapter concludes with a summary of the main findings and sets the context for Chapter 9, the concluding chapter of the thesis.

8.1 Energy poverty and its effects on health

The literature review highlighted how energy poverty can affect one's physical and mental health in a myriad of ways (Abbas et al., 2021; De Vries & Blane, 2013; Pan et al., 2021; Thomson et al., 2017). The AHCD analysis suggests an association between energy poverty and the self-assessed health condition of older Australians, corroborating previous Australian studies (Churchill et al., 2020; Churchill & Smyth, 2021). Those with fair to poor health condition suffered more from energy poverty in more than one indicator, as seen in Figure 8.1. The interview findings explore this connection.

Figure 8.1 - Energy poverty index by self-assessed health



(Source: the author using the dataset from Baker et al., 2019)

8.1.1 The mental health impacts of energy poverty

Reducing energy consumption to the very basic energy needs, in some cases, evoked constant stress, anxiety and depression, which significantly affected interviewees' capabilities. Turning on a portable fan on a very hot day would be a concern to Janine and make her question herself and her quality of life:

> *I've resisted having, even using the fan because I was concerned about the rising cost of, you know, electricity. But I'm starting to think to myself, sitting here the other day, why should I deprive myself? I shouldn't have…*

For Samantha, high hot water costs associated with the inefficient electric storage system she had at home meant she decided not to use the bath for the polymyalgia rheumatica pain management treatment anymore:

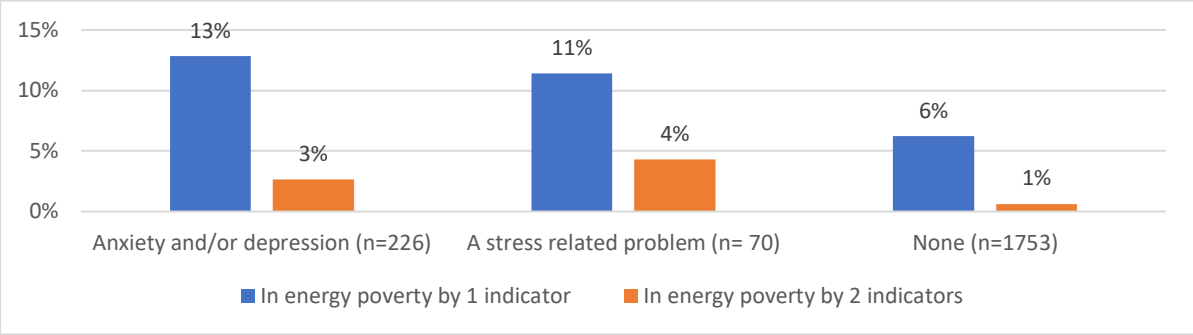
> *The way my body feels like… I don't use hot water anymore for pain treatment. In the other house I had a big old-fashioned bath and because I had instantaneous [gas hot] water supply, I would have a big hot bath and that would reduce the pain level by 50%. But I don't do that here because of the [inefficient] hot water system that I've got. Those sorts of little decisions I've sorted out since I've been here. So that does add to that level of anxiety.*

Not only did she have to endure persistent body pain and stiffness, but her anxiety levels were also very high. Hence, central capabilities of bodily health and emotions were severely compromised. As Nussbaum (2000, p. 79) argues, no one should have their life "blighted by overwhelming fear and anxiety". Besides worrying about reducing their energy consumption to reduce costs, interviewees also feared potentially unaffordable bills—despite all efforts—and felt anxious and stressed as the next meter reading approached. Sonia would become anxious when pondering all the different scenarios to be able to pay the bill:

> *As the time comes towards the bill, you begin to get anxious. You dread [it]. You think, I wonder how big it is? I wonder if I can manage it. I wonder if the charity will help me. How do I do it if they don't? What if the provider doesn't accept a payment plan? What if they want more? What if, what if... Yeah… Anxiety.*

Figure 8.2, drawing on the AHCD survey, shows that older Australians with some kind of mental health problem (either anxiety, depression, or stress) also experienced energy poverty in a greater proportion, and, in some cases, in more than one way, which corroborates previous quantitative studies on the subject (see Thomson et al., 2017).

Figure 8.2 - Energy poverty index by mental health problem



(Source: the author using the dataset from Baker et al., 2019)

The unpredictability of the energy bill contributed to stress and anxiety. The anxiety was much greater when other major bills had to be paid, as discussed in Section 6.1.1. A couple of interviewees felt anxious about debt collectors' calls when having to set up a payment plan or borrowing money from a payday lender to pay the energy bill. Jasmine vented about the anxiety she felt every time her phone rang:

> *Well, normally I would get [anxious]… You know how you get phone calls on your phone, you don't know who they're from? I wonder if that's like the debt collector from the energy company ringing me. I just don't answer them. So, I don't know half the time. Do you know what I mean? Like, just beforehand I think: "Oh hell", you know.*

She was in such a difficult and vulnerable situation that the constant worry about late payments (at the time of the interview, she owed $480 to her electricity provider), the need to approach charities for food and other personal issues made her profoundly depressed. The mental health issues arising from her energy poverty situation prevented her from being able to lead a flourishing life commensurate with human dignity (Nussbaum, 2000) and made Jasmine develop suicidal thoughts:

> *It makes me feel, you know… How depressed it makes me feel. I tried to suicide twice. It's just so, so embarrassing. Do you know what it's like to line up [for charity], you know. My back hurts, my knee hurts. You have just got to line up for food. It's so, so embarrassing.*

The majority of interviewees were able to pay their energy bills on time, so that they could take advantage of the "pay-on-time" discount and not fall into arrears with the retailers. Paying on time often involved major sacrifices in other areas. However, when they needed to approach charities in NSW for EAPA vouchers, some interviewees expressed worry and anxiety when they had to let the bill go overdue to get the assistance. They feared having a bad credit

record, which would affect their credibility and symbolic capital with the energy retailer, and were also concerned about the possibility of being disconnected. Anna feared being charged at higher rates because she was a defaulter, a common problem experienced by those battling persistent energy hardship, as also disclosed in the VCOSS report (2018): "The less you can afford it, the more they charge!". Being placed in more expensive energy plans due to an incapacity to prove credit score resonates with Baudaux et al.'s (2019, p. 49) findings that "it becomes expensive to be [energy] poor". Adam was extremely upset when he was late paying his energy bill and could not get the EAPA voucher due to an administrative error from the charity service. He was also worried that his electricity would be disconnected:

> *When I went to the [government] agency… They said they will help me in terms of getting a rebate [actually a voucher] from the government, for my electricity bill, but they say, "You got to have a late payment or a reminder or an extension because you already passed the due date for your bill payment. Once you get the second letter, then we can help you because you need that letter to give them for evidence that, you know, you're needy, and you can't… you don't have the budget to try to pay your bills on time". So they say at the last minute or nearly at the last minute before they threaten to cut off your power, "We need you to show us that you've got a reminder that you're late and this is the second notice…" and I've done that and they disappointed me because I didn't get the help that I required because they have lost my appointment. And it was like two weeks before my [electricity] was going to be cut off. You know, because [I] already passed the first notice and I'm late already in paying the bill.*

A recurrent concern, related to issues of energy literacy discussed in Chapter 7, was the stress and the burden of having to figure everything out themselves about their energy bills and offers, and constantly feeling they were being taken advantage of by their retailers due to a lack of knowledge. For Rose, who had dealt with mental health issues for a long time, having to think about energy bills added to an already very stressful moment in her life, at a time she could not cope with it:

> *When I was, during my depression stage, a few years ago, I was even scared to even step out of the house or open my mail or something like that, because you know, that is part of the depression. Even though you are intelligent, you don't seem intelligent … To be honest, when I feel overwhelmed, I cannot work things out. And even though sometimes, maybe there is already an explanation on paper [the paper bill], but I cannot understand [it].*

As she explained, existing mental health issues might make it more challenging to engage with energy retailers or get proper assistance, which might push them further into hardship. In this case, it is possible to suggest that the correlation between mental health and

energy poverty is circular and complex. While energy poverty causes mental health issues, the latter potentially exacerbates the former or makes it more difficult to deal with, since there is "emotional labour" involved (Petrova & Simcock, 2019). There is then a downward spiral of energy poverty. A similar situation has been identified by Chavez (2018, p. 182) when studying the triple-hit effect of disability towards a "spiral of worsening energy poverty".

8.1.2 Thermal discomfort and health impacts

Physical and mental health was compromised by the thermal discomfort many interviewees experienced in their poorly energy efficient homes. Usually, the focus is on winter temperatures, and the findings in this study corroborate previous research (Daniel et al., 2019; Willand et al., 2019) that Australian energy poor households have their health significantly affected by cold indoor temperatures in old and inefficient dwellings and the reluctance to use heating appliances. As Grossmann and Kahlheber (2018) point out, there is discrimination towards low-income households in the housing market. Low-income renters, in particular, tend to live in poor quality and inefficient homes that require a greater amount of energy supply than good quality and energy efficient homes (Liu et al., 2019). Sonia, for example, lived in a unit in the private rental sector that was poorly insulated. As quoted previously, not only did she have to endure extreme thermal discomfort, but her electricity costs were also very high due to greater use of the heater (see page 130).

During winter, a few interviewees mentioned cooking to keeping the place warm, suggesting an alternative energy service to achieving a capability related to thermal comfort. Excessive clothing in winter was another typical coping mechanism among all interviewees to minimise heater usage. Denise commented,

> *You just invent stuff. In fact, what is that wonderful old saying? Necessity is the mother of invention. For winter I wear lots of warm clothing all day and only put heater on when really needed just for 2/3 hours then off at the wall. As long as you have woolly socks on and a warm pair of trousers and fingerless gloves and perhaps a warm shawl for around my shoulders. That staves off the need to fire up the heater! Perhaps a hat, bobble hat, too if needed. And then you don't need it, you don't need anything [to heat you].*

Interestingly, Denise highlights how necessity motivates invention, or, in this case, adaptation, which resonates with Bourdieu's (1990b) thoughts about "making a virtue out of necessity". She, like many other interviewees, did not see a problem in wearing gloves, shawl

and hat at home, if this meant she would save on energy costs. Conversely, for other interviewees, the stigma of having to dress more in a cold house were comparable to those found in Day and Hitchings (2011, p. 890): “only old ladies would do that”, with impacts on their self-esteem. Anna compared herself to the “Michelin Man” because of the many layers of clothing she wore in winter.

Other interviewees mentioned how having to wear several layers or stay in bed to cope with a cold home affected their disposition. Jasmine would try to stay cosy in bed with extra blankets and a doona (duvet or quilt) and watch TV during the day and night to avoid having to turn on the heater. This affected her disposition—already damaged by serious mental health issues. Samantha used an electric blanket and “turned her bed into her office”. To keep warm Phoebe would avoid moving too much:

> *I'll probably just put an extra blanket or an extra rug around me and stay in the one [spot], being a bit of a lazy person, so keep the heat together that way.*

Anna felt that spending the day in bed could be detrimental to mental health:

> *Spending the day in bed because that was the only warm place - but also brings psych problems because people at that age think it's slothful to spend the day in bed unless you're dying of the flu. Even if you don't have the religious scruple, the other psych thing about staying in bed at that age is you feel even older. Like you're on your last legs, dying in a hospital/nursing home bed, aged and infirm and probably going “gaga”.*

In Australia the impact of extreme summer temperatures is also pertinent, but evidence is still limited (Climate Council, 2020; Nitschke et al., 2011). A recent study indicated that 37% of global heat-related human deaths from 1991 to 2018 can be attributed to anthropogenic climate change (Vicedo-Cabrera et al., 2021). Despite Australians being “culturally” used to warmer temperatures (Hitchings et al., 2015), residents in NSW are more dissatisfied with their home thermal condition during summer than in winter, with indoor temperatures reaching up to 39.8^{o}C in early 2019 (Haddad et al., 2019). Particularly for older people who often have other comorbidities such as heart disease and high blood pressure, it is harder for them to cope with temperature extremes (Gronlund et al., 2016; Kenney et al., 2014; van Hoof et al., 2017). Some interviewees like Lauren found it much easier to deal with the winter cold than the summer heat:

But, you know, my philosophy is that the cold is easier to fix, because you put something warmer on and that's it. But in summer it's worse, because how do you combat the heat? It's very difficult. To me, summer is more [uncomfortable].

Over half of the interviewees did not have an air conditioner at home. In some instances, appliances were old and inefficient, and interviewees refused to use them or minimised their use. On hot summer days, Samantha relied on water spray to refresh and cool herself:

I've got quite desperate where it used to get 40 degrees … But, you know, I work that way so that I can adapt, you know. I just throw a bit of water around or something like that.

The poor energy efficiency of their homes was a major factor contributing to thermal discomfort. Janine was adamant the inadequate envelope of her building meant that it was difficult to endure a hot summer in Sydney, and she felt the detrimental effects of high temperatures on her wellbeing:

It definitely does affect my health during the summer months because I'm just totally exhausted, you know, and the perspiration just pouring off me. I've never felt anything like where I've moved to now. It's just the worst I've ever, ever felt. And unless you're here and experience [it], it's very hard for anyone to realise how bad it really is. It's too hot. Even if you hop under the shower, a cool shower, and you step out of it, there is just too much heat, you're just hot again, so there's no point in doing that. I'd do anything to try and keep cool, but it's almost virtually impossible. It's because of the building.

Exhaustion, low energy levels and low mood due to thermal discomfort were symptoms described by interviewees. Violet described an unfortunate occasion when she fainted because of the extreme heat inside her home in Melbourne's outer suburb:

Like I can't stay here in the summer. It's just too hot. I can't breathe in here. One day, a friend came over here and I was passed out almost on the couch and she grabbed me and took me outside and took me to her place to cool down. Put me on the couch at her place and got me a cold towel on my head to revive me again. She was ready to call the ambulance. That's how bad it was.

Not using heating or cooling appliances and relying on other passive strategies, such as dressing more or less, suggests the temperatures in their old and inefficient homes were not in line with the recommended WHO indoor healthy temperatures (WHO, 2018b). So as to avoid thermal discomfort at home or having to use their heating/cooling devices, interviewees would frequent libraries, community centres or shopping malls. Some of them used these contexts

to socialise. Iris, despite her back and lung problems, would make an effort to go almost every day to the nearby community centre and engage in the free activities coordinated by the NSW Older Women's Network. Besides the social aspect, a major motivation was feeling more thermally comfortable without having to worry about high energy costs:

> *I try to go out, so that I don't need to use energy… You know, if I don't stay here [at home], and then I don't use it. If I become too hot, I go to the activity [community] centre… I go there to cool [down].*

Adam had recently had heart surgery and was very sensitive to temperature extremes. However, he could neither afford to run the old and inefficient air conditioner at home or buy a new and more efficient one. This had a major impact on his quality of life:

> *We don't use the air conditioner because it's too old and inefficient for our purpose. But I really do need it. I really desperately need the air conditioner because of my recent operation in my heart, and I have a heart condition. So, I get very tired and hot easily because of my ability to cope with the hotter weather and humid[ity]… The hotter weather, especially this summer, it's been very energy sapping, very tiring for me… When I'm just trying to do little things, housework or do a little bit of gardening and I don't have any… I can't get any relief at home. And [energy costs prevent me from affording] the cost of an appliance like an air conditioner, a bigger air conditioner that [cools] the large area of the lounge room and dining room. It prevents me from improving and making my life better.*

Amelia complained that, during summer in Sydney, her home was hot even late at night. She blamed it on climate change.

> *In summer, if there are more than a couple of days that are really hot, it gets extremely hot. It's like a hot box here. I've got fans as well, fans in the bedroom. There were some nights this year, when we had over 40 degrees, and the fans were useless. The fans were absolutely useless. … [I] just put up with it. The heat has been much worse this year [2020 with bushfires]. In addition to the smoke. So, so I've actually found the nights, much worse this year. The heat of the nights. So yes, I'd say the hot days have gone up. Perhaps the last two years more than anything I've noticed.*

Other interviewees mentioned it has become harder and harder to cope with colder winters and especially warmer summers. Interestingly, one interviewee pointed to a different perspective between energy poverty, summer temperatures and unhealthy eating. The excerpt below suggests that the impact of warmer temperatures on public health go beyond more hospitalisations due to heat exposure. Unhealthy eating leading to obesity, which is already a major issue in Australia – affecting almost half of older Australians (AIHW, 2020a), could, in a few instances, be worsened by energy poverty. This expands on the findings from

Prakash and Munyanyi (2021), who drawing on HILDA data suggest that being energy poor results between 1.4% and 2.5% increase in the probability of being obese. Anna commented,

> *Because of the unusual heat, I found the only way I could keep cool was with ice cream and cold fizzy drinks. Normally I never put drinks in the fridge, but I had to. I'd just lost 15kg and was insistent I would keep it off - but even I can't deal with 47°C heat unaided. Instead, I put on 20kg. If I'd had air con to use, I'd be 25kg lighter than I am now. Air con is high on the "Too-Expensive-to-Use" list.*

Recent research on the nexus between housing and wellbeing drawing on the capabilities approach argues that this relationship is highly subjective and complex, with many social and cultural factors contributing to diverse experiences (Harris & Mckee, 2021; Irving, 2021). Nevertheless, adequate housing conditions are essential to the exercise of key functionings. The findings above indicate that energy poverty plays an important role in how households experience their home and how this affects their health, wellbeing and capabilities. Key capabilities associated with emotions (mental health), bodily health and integrity and control over one's (home) environment are potentially impaired by energy poverty.

8.2 Energy poverty and its impacts on the capacity to purchase essentials

According to the ABS (2016b), pensioners (in general) spend on average 70% of the amount spent by non-pensioners on energy. Despite this they also need to cut spending in other areas such as food, personal care, recreation, clothing and footwear, medical and health. While all household goods and services expenditure per week consume 80.3% of the mean disposable income of non-pensioners, 97.5% of the mean disposable income of pensioners are diverted to their household expenses, leaving them with minimal or no savings. Living on a low income means that high energy costs can result in individuals compromising on the consumption of food and essential household items (Anderson et al., 2010). The lower economic capital caused by high energy bills relative to income, can place households in challenging circumstances and force them to make trade-offs between which basic capabilities will be maintained and which will be undermined or even curtailed.

8.2.1 Energy poverty and food insecurity

The interviews corroborated previous research (Hernández & Siegel, 2019; O'Neill et al., 2006) on the close tie between energy poverty and food insecurity. Being able to have a

nutritious diet is a key capability for bodily health and essential for human development. By prioritising paying energy bills on time, Age Pensioners often compromised on food consumption in different ways (see Wilkinson et al., 2021). As Sonia emphasised,

> *[The energy costs] affect the amount I'll have left to eat with. And I know that my electricity bill is manageable if I don't eat too much.*

Like Sonia, some interviewees, after paying their energy bill, had less disposable income to purchase nutritious and adequate amounts of food. They would choose the cheapest food available and the special bargains, or try to purchase food that is more easily prepared or that does not require using electricity or gas (often very industrialised). When asked whether the energy costs had an impact on her ability to purchase essential items and groceries, Jessica explained that she would always opt to buy the cheaper food. Jessica's energy bills comprised about 10% of her disposable income (after her social housing rent was deducted).

> *I have to admit, you buy cheaper things for food, the cheaper quality, rather than the better quality because it's cheaper. You can buy that [the cheaper food] rather than the dear stuff because you can get more*.

After getting assistance from a charity and changing to a cheaper energy plan, Sonia was so thrilled she could finally pay an electricity bill on time—and not have to set a payment plan—that she chose to compromise on food expenditure to make sure she could get the pay-on-time discount:

> *For the first time in four years [I could pay a bill on time]. And you know what, it was such a thrill last fortnight. I paid it straightaway. No payment plan. I could have paid it [later], but I didn't want to leave it. I wanted the thrill of paying it straight away. Even though it left me with not that much over to eat. The thrill was to pay the darn thing straightaway. Out of my sight.*

Violet felt her health was compromised by her unhealthy diet which she attributed to her rent and energy bills accounting for a large proportion of her income. The well-known "heat or eat" dilemma (Frank et al., 2006) was a constant for her and made her life very challenging:

> *You can't shop properly and then your health goes down the plug, you know. If you go to shops, you see the chips and the lollies and that. They are cheaper and the people are buying those because they can't afford to buy broccoli and that's because broccoli is like $8 a kilo, you know. So, you know what do you do first? You feed yourself, put the heater on and hope that it's [the energy bill] not going to be too high? It's very, very hard.*

Sometimes I just, you don't know what to do first. So, I opt to pay my bills and pay my rent first and whatever is left over, then I see where I am and how I am. And what I can afford, I buy and what I can't afford doesn't get bought. That's all there is to it ...

In some of the more extreme cases, they had to rely on foodbanks and charities. These sacrifices impacted on the health of some interviewees (Tuttle & Beatty, 2017). Jasmine was the interviewee with the highest level of food insecurity. Her health condition (osteoarthritis and osteoporosis) meant she needed to use more heating in winter, and she had nearly $500 in overdue energy bills for the previous 6 months. Trying to catch up with a payment plan forced her to rely on charities for her food requirements:

I go to food banks. And then I might go to three or four food banks... A lot of the stuff from the food banks are mainly out of date and they are just rubbish… And I try and save that way. It's a lot of work to kind of go like that and then you get confused which ones you've been to, but anyway. I don't tell anybody that.

Jasmine felt that the food she got from the food banks contributed to her gaining weight, which in turn worsened her mental health and ultimately the amount of time she spent alone at home, further increasing her energy costs. With her example, it is possible to see how energy poverty can contribute to food insecurity, unhealthy eating, and depression.

I live on bread and baked beans or spaghetti or something like that… All it does is make you put on more weight. It makes you more depressed and then you stay home more, and you use more heater or cooling because you don't want to go out... You don't get no meat or nothing, you just get like tins of baked beans and some frozen stuff sometimes and out of date food. … It's disgusting, you know? You just get so angry, you know. If I am eating food that is out of date by a month of something, you know what I mean, good God, terrible.

8.2.2 Energy poverty compromising the ability to purchase other essentials

As Violet revealed, food is not the only essential low-income older Australians compromise on when struggling with energy bills. Other basic needs, such as clothing and hygiene products were neglected:

Oh no, I can't just buy what I want. It does stop you from buying certain things. No, I can't do that. You know, like, a lot of personal hygiene stuff. You can't just go and get [them]. Like, say a body wash. I'd buy a body wash, but I might not buy shampoo. So, I use the body wash to wash my hair. You know what I mean. And if I don't go out, I don't use deodorant, if I am going to be home… and then even cleaning stuff. (Jasmine)

Interviewees spoke about the recurrent struggle of trying to budget for essential items after energy bills were paid, and what kind of compromises they would have to make and how that affected their mental health by adding another layer of worry and stress:

> *I have to think as to where I have to shop in order to get my necessities cheaper. I will calculate how much driving I need to do ... [Because I'm on a tight budget], I would get so upset saying, "Okay, what am I buying? What am I doing wrong with this and that?" So you know I would return something or not have it because, you know, it could do this, but I could do without it. I would go over everything in my head, which gives me anxiety because I am not living the quality of life that I have worked for*[71]*. (Rose)*

The general argument of the capabilities approach (Nussbaum, 2000) is that everyone should have certain universal values guaranteed to be able to live a life worth living. It is evident from Rose's comment that energy poverty prevented her from achieving this. Although she thought she could live without certain essentials in order to pay the energy bills, this caused significant dissatisfaction with her life. Even for those with relatively low energy bills, living a very frugal lifestyle was necessary in order to make ends meet. Denise, for example, could not afford private health insurance and was mostly reliant on second-hand clothing and furniture:

> *No insurances, no superannuation, all gone. Don't gamble. Second-hand clothes and furniture over 50 years, apart from new shoes unless lucky at Vinnies or Sally Ann shops.*

Because of high energy costs, Violet said she could not even afford underwear:

> *It prevents you [from buying essentials] because it [the bill] goes so high, you can't afford to eat properly, can't afford to go [and] buy underwear or can't buy a blouse. You can't afford to get any of those things. There is not enough money in the budget. I haven't had a bra for as long as… I don't have a bra. I can't afford it anymore.*

Being able to purchase clothing, hygiene products and other necessities enhances one's sense of dignity and self-image, which reflects Nussbaum's central capability of affiliation, as in "having the social bases of self-respect" (See Table 3.1). It also affects their symbolic capital, as their self-esteem is jeopardised. Daniel explained what a difference cheaper energy plans could make to low-income older people's ability to purchase essentials:

> *I mean a couple of extra dollars a fortnight probably won't matter too much to anyone, but yeah, I mean over a year or something, it may be $100 total or something and that can be used for other things. It might be to, you know, buy some clothes or to buy a new pair of sneakers or something like that. It's better for the older person who is on a limited*

[71] Until her late fifties Rose had a skilled job. After losing that job, she was unemployed for a number of years.

income, you know, if they can use that money for those sorts of things, instead of paying for the electricity.

8.2.3 Energy poverty compromising medical treatments

In some cases, the limited disposable income of interviewees after paying the energy bills meant they could not obtain the medical care and/or medication they required. This had an impact on their capacity to maintain bodily health. This was particularly so for treatments not subsidised by Medicare. In Australia, many specialist doctors do not "bulk bill" which means that patients must pay "the gap". The gap refers to what they pay for their treatment and what they get back from the government (Medicare). If a specialist bulk bills, there is no gap, and the treatment is essentially free. Daniel had referrals to book medical specialists but could not afford to see them. He felt the money spent on energy bills was a factor:

[If] I could reduce the [energy] bills, then I could use that money for other things … I could use it to pay for more medical issues, health related things … Like I have some specialist referrals that I haven't been able to afford to go and see because of the cost of those.

Not being able to afford the gap in specialists consultations because of energy poverty gives greater urgency to Sherriff et al.'s (2020) argument that there is a need for an innovative and integrated approach to identifying and assisting people whose health is compromised directly or indirectly by energy poverty. Rose was worried because she knew she needed an MRI (magnetic resonance imaging), but was afraid the money spent on the procedure would prevent her from paying her energy and other bills:

I am a bit scared at the moment because I should be getting an MRI this year, but I don't have the money to pay for that, you know what I'm saying. What [if] another bill comes and I realise that, you know, that's not enough? So the way that I am living my life. I am only going to spend for whatever I need.

For Amelia, any unexpected medical expense evoked concern about her ability to pay the energy bill.

If I have an unusual expense, for example, I had to go to an eye specialist recently. And that was an unusual expense. If I have unusual expenses, it puts me behind [on the energy bill].

A similar thought was shared by Samantha, who commented that her pharmacy bill was one of the variable costs she could modify to fit in her limited budget: "It is a bit of a juggling act, along the line…". Even for Lauren, who owned her home outright and had

considerably lower housing costs than her counterparts in social housing or the private rental sector, her energy bills were still a major factor for her choosing to cut back on physiotherapy sessions. She could not afford to do them as frequently as prescribed by her doctor:

> *Look, I have the physio bills, for example, that are not covered [by Medicare], so, well, I have to pay for them. They [the government's scheme] give you five treatments a year… But [for my condition] it adds up 24 [sessions] a year, so I pay for 19 that are not covered [by Medicare]. But what I've been doing is, instead of going twice a month, I go only once a month.*

8.2.4 Energy poverty and the need to relinquish hobbies and recreational activities

Trade-offs were a constant in the lives of the interviewees. Jessica captured this tension: "My bills get paid. But I mean, sometimes you rob Peter to pay Paul, but you get there". For most interviewees it also meant they were unable to spend money on leisure and entertainment. Being able to enjoy recreational activities and have hobbies is also a central capability, as Nussbaum (2000, p. 90) states: it "is not desirable to give adults lives in which there is no chance at all for leisured play". For some interviewees, simple activities, such as going to the movies, were out of reach. Lauren had to cancel her opera subscription a few years ago due to increasing energy bills, and Samantha gave up buying art material because she knew money spent on it could be "better used" paying for energy and other essential bills:

> *But the thing I can't really afford to do is buy art materials. That's what I do, art. I'm an artist. So that's what I give up in order to live the way that I live on little money.*

Giving up on art materials would most likely affect her own sense of value, even though it was a much-needed concession in order to cope with her limited income. Other forms of entertainment that were restricted were related to internet access. Besides the cost of internet connections (also a signficant concern for many older Australians as seen in COTA, 2021), the energy consumption of the internet modem was a worry. Charles mentioned he did not listen to as much music as he liked due to high-priced electricity and internet costs, and Rose was very worried about how she would afford to have broadband installed at home after running out of Telstra (Australia's biggest telecommunications company) mobile data credits:

> *And also, another thing with the budgeting is because my electricity is high, I have to limit the way I go online, you know. I cannot watch a movie on Netflix. I don't watch a movie, I don't download any songs or something like that. And I limit the way I use the internet, because that is like $70, that is the cheapest I have found so far, $70 monthly,*

but you need to fork out another $300 to connect you up [for the modem]. And I don't have the $300 to connect myself up, to be honest.

Limiting online services due to them being unaffordable also affects their opportunities for digital inclusion. Although I point to the use of internet for leisure and entertainment, it could also be limiting their opportunities to engage with the online energy market as discussed in Chapter 7. Another form of acquiring cultural capital (energy-related or not) that was restricted due to energy consumption concerns was the use of TV. Two interviewees did not have TV at home, and those who had one tended to limit the hours it was on (as also seen in Chester, 2013), despite spending most of the time at home. Anna cancelled her online streaming service. She realised she could not afford the costs. Besides the cost of the subscription, the services increased her energy bill substantially (it required a modem):

My neighbour at the time said Foxtel was a great deal, equivalent to a movie a week and I had it all day, every day. I had a Foxtel box and finally made them take it back because I didn't want to go bankrupt and my next [energy] bill was MARKEDLY smaller. I was shocked by the usage of the Foxtel box. [After cancelling Foxtel], my power bill went down for the first time ever! Those boxes suck an incredible amount of power! Many older people have Foxtel for the same reason as I did - cheap, 24-hour entertainment/company. They don't factor in the huge electricity cost.

This quote captures how Foxtel (and similar streaming services) can represent company particularly for lone-person older households. In the next section, the issue of social exclusion as an impact of energy poverty is explored.

8.3 Energy poverty and social exclusion

Chapter 7 illustrated how the lack of social capital can aggravate energy poverty when it results in households being out of the loop as consumers and/or unable to engage with the energy market or reach institutions (or family and friends) to ask for assistance. In this section, I underline what Middlemiss et al. (2019) found in their research: being energy poor can lessen socialisation opportunities and intensify feeling excluded from society, further reducing one's social capital. Furthermore, a key capability, affiliation, as in the ability to engage in various forms of social interaction, and having the social bases of self-respect and non-humiliation is diminished (Nussbaum, 2000).

Corroborating previous Australian studies on the relationship between energy poverty and social exclusion (Morris, 2016; Willand & Horne, 2018), for those low-income older

Australians on a very tight budget, one of the key impacts of high energy costs relative to their income is reduced or no socialising. As seen in the previous section, to be able to save money for energy bills, some interviewees needed to limit spending on mobile and internet plans, which certainly limited their capabilities to socialise virtually. Face to face socialising was also severely curtailed. Interviewees avoided leisure activities and even visiting friends, as they needed to "budget for every cent", and money spent on social activities could be better spent on other essentials, such as food. When renting privately, Jessica was constantly worried about her financial situation due to housing and energy costs, and it affected her capacity to socialise, as she would think about the trade-offs:

> *I never went out for a meal… Not even a coffee because to me going out for a coffee, I could get something else with it. I could get a packet of Weetabix or something if that makes sense … I had a dog then and I used to go down to the dog park and walk him, so that was my social outlet … I felt I couldn't afford to go anywhere with anyone. You were always asked, but I never felt I had the money to go out.*

Outings with friends or family that involved any expenditure were frequently avoided, and feelings of worry and embarrassment were common (Longhurst & Hargreaves, 2019). As a private renter in Sydney, Sonia's energy costs were a substantial part of her disposable income. She explained how the cost of energy, combined with her rent, had had a dramatic impact on her social life:

> *I have no social life. I can't afford it. There is one neighbour who was very friendly, and she would ask me out for coffee. Often, I would have to say, "No, I can't afford to". That's very embarrassing. It really cuts down your social life completely. You can't even afford to go out for a bit of lunch and a coffee.*

Jasmine's high energy costs meant that maintaining a social life was extremely hard and had to be budgeted well in advance. She would feel embarrassed and frequently avoided telling friends about her situation, masking her circumstances to preserve her self-respect and symbolic capital:

> *Oh, yeah right! [My social life is] non-existent. You know, if I go out my friends and they might buy a coffee. I mean, that's like $4.50 something $5 and I never ever, ever get one. I just, I take my own drink with me. Cordial or something, or water. I just say, "Oh no, I just want to drink water. I don't want to drink too much coffee". Make up an excuse. I don't know when [was] the last time I went to the movies …*

Connon (2018) in her case-study of four communities in the UK found a similar pattern. The people she interviewed tended to hide their energy poverty situation or become isolated. Violet was also unable to join her friends in a restaurant or accompany them to the cinema:

> *I tell you what, unless my friend pays for a meal if I want to go out with them, I can't afford it. I just can't afford it. There is just no way. It's too much. I'd like to go to a restaurant with my friends every once in a while. I like to go out and see what's happening. But I can't. I can't even go to the movies, you know. I can't afford the movies. It's just not in the budget.*

Both excerpts above mention the inability to afford going to the cinema with friends, which besides being an opportunity to socialise and maintain social capital is also a source of cultural capital, like books and works of art (Bourdieu, 2002). Some interviewees joined free social activities, such as book clubs and community centre events to enhance their social networks, but others felt completely excluded from society.

On the rare occasions Rose decided to attend a social event, she would peruse the menu online prior to setting out, so that she could calculate what she could order without compromising her budget. However, in most cases, just like Sonia and Mary, Rose also passed up events which involved her having to spend money. This affected her emotionally and caused her significant distress:

> *If there is another birthday coming up and it's like, you know, that's a stress on my part. Because then I won't go to that party, because you know, I don't have a gift. So, it impacts my, you know, the way that I look at myself, you know. So yeah, psychologically it affects me.*

In Chapter 7, I discussed how feelings of shame would prevent energy poor households asking friends and family for assistance. Jasmine highlighted another issue about requesting assistance – losing friendships and feeling isolated and ashamed afterwards: "Yes, I have [asked for help from family and friends]. Yes. I've asked a lot of people for money [and] you lose a lot of friends [in the process] and it's so embarrassing".

8.3.1 Avoiding having guests at home due to energy use concerns

The findings from the AHCD show that the inability to keep comfortably warm or cool at home (as seen in Section 8.1.2) is correlated (contingency coefficient, r=0.132 and r=0.145 respectively, and ρ=0.000) with the ability of older respondents to receive guests at home. It is likely that feelings of shame and embarrassment of the thermal discomfort (as described in

Anagnostopoulos et al., 2016; Longhurst & Hargreaves, 2019) inhibit households from receiving visits at home, highlighting the influence of the low energy capital on the capability of affiliation and ability to preserve or acquire social capital.

The experience of energy poverty by one or more indicators is also correlated (contingency coefficient, r=0.192, ρ=0.000) with the older respondents' ability to receive guests at home. One in four older households who believed their homes were not completely suitable to receive guests (n=118), i.e., responded either "yes, with some reservations" or "no" condition to receive guests, also lived in energy poverty by one or two indicators, as opposed to only 7% of those who thought their homes were completely suitable to receive guests (n=1875).

Not feeling completely comfortable about receiving guests at home due to energy poverty can be a potential cause for social isolation (and reduced social capital) among older households, especially for those who have a long-term health condition that restricts their daily activities. Previous studies have shown that either energy poor households tend to entertain less at home, given concerns about energy use and thermal comfort (Chester, 2013), or opt to disguise their situation by using energy beyond their means when guests arrive to avoid the shame of being seen to be financially struggling (Connon, 2018). The interview findings accord with Chester's conclusions and an in-between situation. A couple of interviewees mentioned that because of their inability to heat or cool their homes adequately, they were worried guests would feel uncomfortable but they were determined to keep their energy use to affordable limits. Charles invited a few friends to his home on a hot day. He could only afford a pedestal fan and was concerned with the guests' impressions: "They came around and they found it was, even though, windows and doors were opened, it was oppressive, yeah". Some interviewees avoided having visitors altogether, as they were concerned it would increase energy consumption and costs. Samantha had her nephew living with her for a while, but was relieved when he left:

> *But I don't entertain or cook anymore. I don't do any of that sort of stuff. … I don't want to have any more people staying. And so that reduces costs quite a lot, not having guests. I know that this happens. When my nephew came to live [here with me], the electricity bill doubled just with one young man in the house. It might be that he had four showers a day. You never know what it is that "they" [younger people] do. So that's something that I have learned. And I decided … [to avoid guests] because I've exhausted my finances.*

Interviewees, particularly lone-person households who had extremely frugal attitudes towards energy use, were not only worried guests would consume more energy, but were also concerned about themselves having to change their behaviours and increase their daily energy consumption. Denise lived alone and would normally shower every second day to reduce the hot water use. However, when having somebody staying, she felt "compelled" to shower every day:

> *If I have a friend stay, of course I shower in the afternoon as distinct from the morning so that he can have the morning shower … it's only then [when I have a guest staying] I have a shower a day. The shower gets used on a daily basis but if it's only me, it's every two days.*

Reducing the opportunity for social connection because of energy poverty can create a cycle of energy poverty problems. For older low-income households, mostly for those who lack computer literacy or have poor access to internet services, social connections can play an important part in alleviating energy poverty, as they provide an opportunity to receive trustworthy information and advice from friends and family in regards to their energy bills. As seen previously in Chapter 7, for many interviewees, face-to-face contact and conversation were their preferred and sometimes only trusted way to learn about energy related subjects. Furthermore, it is important to acknowledge the potential mental health effects on older Australians' wellbeing that social exclusion due to the inability to receive guests at home and energy poverty can impose. In the AHCD survey, respondents were asked whether "the overall condition and quality of your house enable you to have family and friends around?"; 14% of those who had reservations with respect to their housing condition enabling social interaction also had anxiety and 11% had depression, while this was the case for only 5% of those who believed that their housing conditions were completely suitable for receiving guests.

8.3.2 Energy poverty and experiences of humiliation and discrimination

Experiences of humiliation and discrimination are closely linked with the central capability of affiliation. Interviewees mentioned they felt (symbolically) excluded, helpless and humiliated when trying to contact their retailers or the ombudsman. In some cases, they suffered ageism. Discrimination based on age can have detrimental effects on older people's rights, needs, and dignity (Barrett et al., 2021). Being disrespected and not being heard by energy retailers was not unusual. It led the interviewees concerned to feel they were powerless

and could not get any resolution. At the time of the interview, Janine had recently changed her electricity plan. However, when she later received the electricity bill, the new (and cheaper) energy rates had not been applied. It was not the first time Janine had a dispute over a wrong energy bill, and she was adamant that she had been overcharged:

> *When I received the bill, it was still at the old rate. So, I got on the phone and I rang, and you couldn't speak to anyone in Australia. You speak to someone in the Philippines, and she was so rude. From the very start she was screaming at me, carrying on. And, she said, "I'm going to go and listen to the phone call [the recording of the phone call when Janine changed her electricity plan]". I said, "Okay, well, good luck with that. You're not going to keep me on, because it was a two-hour phone call". She said, "Well, I'll ring you back". So, she did ring back. And she said, "We've listened to it. You're wrong and we're right". So, what could I [do]? I write down everything that's been asked or said to me, you know, so I have a reference there. So I thought, what can I do?*

Violet also recounted how she had been humiliated by the customer service of her energy retailer:

> *When I got my bill, when I saw it, it was like $70 up, and at that time I hadn't used my [heater], because it was the end of summer. You know, we don't use it in the summer. … And then she's making me look like, you know, she got me on the phone, like it's my fault for everything, like I'm the stupid one. That's how I felt with that woman … She just made me feel like an idiot, you know. She talked to me like I was an idiot and I said, "I know I am an old lady … but you know what, I am not stupid and I don't need that kind of talking down, that dressing down too".*

Making sure one is treated as a dignified being whose worth is equal to that of others is a central capability (Nussbaum, 2000). Experiencing energy hardship is already a very challenging life circumstance and being mistreated and disrespected by those who have the power in the field (the energy retailers) only worsens their situation. The discrimination experienced affected their self-esteem and symbolic capital.

8.4 Energy poverty contributing to a change in energy practices

A primary focus of qualitative research on energy poverty has been on the coping mechanisms of energy poor households (Baudaux et al., 2019; Goodchild et al., 2020; McKague et al., 2016). Some of these mechanisms can be understood as adapting behaviours towards conscious, less resource-intensive and sustainable energy practices, such as turning off the powerpoints connecting appliances, turning off lights when not in use, hanging clothes out to

dry as opposed to using a dryer, or cooking in bulk. On many occasions, these behaviours are seen as positive and are recommended effective strategies to reduce energy consumption and carbon footprint (as seen in Australian Government, 2021a). For Spurling et al. (2013), such behaviours are seen as individuals' performances of wider and usually accepted social practices. Wider social practices are defined by "interdependent relations between materials, competences and meanings", where materials represent the things, resources and technologies being used, competences reflect the skills and cultural capital, and meanings include the symbolic significance, social rules, aspirations and ideas (Shove et al., 2012, p. 14;24). The interviews findings analysed below illustrate how energy poverty and the fear about the unaffordability of bills led participants to change their energy practices and behaviours. This could be argued as a forced change in the materiality of the practice, as the lack of resources (particularly economic capital) affected how the practice was performed. It is noteworthy that some of these acquired energy practices can be extreme and potentially detrimental to health and wellbeing.

8.4.1 The constant and uncomfortable thinking about every energy practice

In this section, I discuss how energy poverty shaped interviewees' energy practices, i.e., how they changed and adapted their energy consumption at home due to living in energy poverty. There is also a hidden energy poverty component behind interviewees' frugal lifestyle (Eisfeld & Seebauer, 2020; Meyer et al., 2018), as discussed in Section 5.2. The perceived impact of energy poverty on their energy practices is captured in Jasmine's exasperated comment:

> *You're not free to walk around and like leave the light on or just get up in the morning and put the heater on and have the heater on all day if you are home. You have to kind of put the heater on, warm up, and then turn it off again. Do you know what I mean? You can't just relax like that. You just can't… Yeah, you can't be comfortable. I put the heater on, and I turn it off. And I put more clothes on. You know, I'd like to just walk around like 20 degrees all day. Keep it on all day if it [electricity] was cheap enough.*

Jasmine's quote highlights not only the emotional labour (Petrova and Simcock, 2019), but also the mental labour associated with living in energy poverty. Taken for granted actions need to be reconsidered all the time, such as having the heater on, on a cold day. Having to constantly think about their energy practices and making trade-offs that end up causing discomfort or dissatisfaction was a common theme among interviewees.

The relentless endeavour to avoid energy waste at all costs was overwhelming for some of the interviewees. Their understanding of energy waste, however, was very different to the average household. To reduce energy waste, in their conception of it, most interviewees reported at least one extreme adapting behaviour. These included showering less (every second day), changing cooking and food intake patterns to reduce the use of electricity or gas (as explored in Section 8.2.1), changing the use of spaces at home to avoid heating or cooling bigger areas, relying on passive ways of "insulating the body" against cold weather wherever possible instead of turning on a heater and coping with extreme hot weather without a cooling device. Some were aware that these behaviours were detrimental to their quality of life and health. Iris, who was 78 years old at the time of the interview, highlighted how uncomfortable she felt when trying to reduce her hot water consumption in the shower:

> *The sorts of things I do [to reduce energy consumption] ... I just don't run the hot water. Even the shower, you know, when I'm washing the body. I just turn it off. You know it's freezing in the winter, but [I still turn it off] …*

It was also common that interviewees did not possess common domestic white goods, as seen below in Table 8.1. Just over half of the interviewees did not have an air conditioner at home, and more than a quarter did not have a heater, which resulted in intense thermal discomfort reported in Section 8.1.2.

Table 8.1 - Presence of domestic white goods and other appliances among interviewees

	Yes	No
TV	20	2
Microwave	19	3
Dishwasher	2	20
Washing machine	19	3
Dryer	7	15
Air-conditioner	10	12
Heater	16	6
Computer	14	8
Freezer	1	21

(Source: the author)

Some of these appliances can reduce physical household work, such as dishwashers, washing machines, and dryers, which could be beneficial for older households, particularly those with health conditions. However, the unaffordability of these appliances and the fear that they could increase energy costs made purchasing them an unacceptable proposition. Only two interviewees had and used their dishwashers. Three interviewees handwashed their

clothes, and two thirds did not have a dryer. Appliances like dishwashers and dryers were seen as energy wasteful and completely unnecessary, as Anna explained:

> *I don't believe the tripe about the water-saving abilities of dishwashers either - but that never says anything about electricity for heating water to 70 degrees [Celsius]…*

Even small domestic appliances, such as hairdryers, kettles or radios were used sparingly, revealing that the uncomfortable energy rationing thinking was present at every moment of their routine, not only when they had to consider turning on the most energy-draining appliances, such as heaters. Janine, who decided to switch to a battery-operated radio to avoid connecting it to the power point, also turned off her oven at the electric circuit breaker to avoid the electricity consumption of the timer:

> *The circuit breaker, you know what I mean, because of the oven… and it's got a built-in digital timer on it. And I think, "Well, if I have that switched on all the time, so that's using up power". Power that I don't need because I have three clocks in the place and a couple of watches … So, I switch that off at the power, at the circuit breaker until I need to use it. So, it's just that I'm vigilant about not wasting power, you know.*

Rose decided to buy a 24-hour thermos to make sure she would only have to boil the kettle once a day. Many interviewees avoided using the oven and preferred cooking meals on the stove, in the microwave or using toaster ovens, like Bill:

> *I cook meals that I can put into the microwave... So, I might have free meals [from charity] in one day, and it can vary…Can be on a Sunday or mid of the week… No set time... just when you have their meals. What I prefer to use is… It's called a comfy oven*[72]*… I prefer to use that. I pre heat it and also use the microwave too... and also the small toaster oven. I don't actually use my big oven at all…*

As mentioned in Chapter 6, a recurrent theme was the vicious cycle of not being able to afford energy-efficient domestic appliances and the high energy costs associated with old and inefficient appliances and minimal disposable income (Baudaux et al., 2019; Halkos & Gkampoura, 2021).

8.4.2 Older low-income Australians' energy consumption patterns

Interviewees' extreme strategies to avoid energy waste and reduce energy consumption corroborates the fact the energy consumption of older low-income Australians is considerably lower than that of the average Australian household (ABS, 2012a, 2016b).

[72] Used to refer to bench-top electric compact ovens of 15-30L capacity.

While, for the average household, heating and cooling accounts for around 40% of total energy consumption (DEWHA, 2008; DIS, 2015), the interviews have shown that older energy poor households refrain from using (or even owning) air conditioners and central heating/cooling systems.

It was not possible to have direct access to their energy meter readers, but the fact that, for most interviewees, their energy bills remained fairly constant throughout the year shows that there is not much, if any, heating and cooling involved in winter and summer months. Taking an example from Bill's energy costs, whose energy source at home was just electricity (including for hot water purposes), Table 8.2 depicts his expenditures and seasonal consumption throughout the year.

Table 8.2 - Bill's energy costs throughout the 2019/2020 year

Period	Energy costs (AUD)	Paid on time discount included (AUD)	Energy consumption (kWh)	Difference in kWh per day	% of increase
Autumn/Spring	169.07	136.63	494	-	-
Winter	195.93	158.45	573	0.85	16%
Summer	180.69	146.22	525	0.34	6.3%

(Source: the author)

Bill, like most interviewees, would always pay his electricity bills on time to take advantage of the "pay-on-time" discount – around 19% off the original amount. He did not have an air conditioner at home. In winter, he would use a portable fan heater only when "absolutely necessary", and, in summer, a pedestal fan occasionally. Consequently, the average daily change in kWh per day is minimal in summer and still fairly small in winter, despite the greater need for hot water and heating. As he said, "I keep an eye on my bills, and I see they are very, very similar all the time… Nothing ever changes, hence … my bills don't change that much". His average energy consumption was around 5-6kWh daily, which is almost half of the typical 1-person household energy consumption in Sydney (9.3 kWh/day), according to the AER benchmark (Australian Government, 2021c)[73].

Like Bill, the vast majority of interviewees who shared their bills with me had daily energy consumption of between 4 and 6kWh/day. If their homes were energy efficient, the low average usage and the marginal changes in energy consumption throughout the seasons

[73] A similar example was provided in Chapter 6, when I discussed Adam's difficulty in making sense of the electricity bill's comparison graphs. His family of three used significantly less energy than a 1-person household in his suburb.

could be attributed to the fact that they did not need to heat or cool their homes, but the evidence points to the opposite. They experienced thermal discomfort but preferred to cope with it rather than risking falling into arrears with unmanageable energy bills. Therefore, most of their energy consumption came from old and inefficient everyday use of household appliances, such as fridges, ovens, microwaves, etc. and a significant proportion of their energy costs were actually supply charges, which cannot be reduced by limiting energy use. Targeted approaches towards energy efficiency of domestic goods should be developed to this specific vulnerable group, and policies on energy rates reduction should be implemented to reduce their energy costs.

An interesting point made by many of the interviewees related to the flexibility and freedom of lone-person households in reducing energy consumption since they did not have to worry about catering for others in the household or entering into conflict with someone else. Iris, for example, would avoid turning on the artificial lights, and, besides the focus lamp for the computer, she would mostly rely on candlelight—even though she had cataracts and increasing difficulty with vision at night:

> *Just the one table light for the computer… Other than that, just candlelight. It's romantic, you know (laughs). It's enough, I mean… I don't need a very bright, bright light. It's just one person.*

Denise explained the feeling of living on her own and her "luck" in being able to further reduce her energy consumption without the interference of others:

> *And because I live on my own, I can be dirty for as long as I like. I'm not a dirty person, don't get me wrong, but I don't have to have two showers a day, let's put it that way!! … Well it's different if you've got a family. You know, when you live on your own, you can get away with everything … You can do what you damn well please. You can do what you want. There is nobody saying, "Oh, I don't want you to do that", you know. So, we were a little bit lucky in that respect.*

On the other hand, care-giving responsibilities would make interviewees prioritise heating and cooling needs of those they were caring for. While caring for her mother in previous years, Janine would always make sure she would be comfortable, irrespective of costs. After her mother passed away, she decided she would not use the heater anymore—to save on energy costs:

> *I had my mum at home, like from 2009 to 2013. I cared for her the whole time, I didn't want her in a nursing home or anything. She passed at home. And of course, I'd always*

have the heating on winter for her because she felt the cold. I'd always have the cooling on [for her too]. [After her passing,] I'd sort of made it in my mind, seeing I'm not getting any wages, or I have no income. I refuse myself to have the heater on, which I can get by with. It does get cold here in winter.

It could be argued, as pointed by Middlemiss et al. (2019), that it was easier for households to recognise the energy needs of others than themselves. In this sense, it was fairly straightforward for interviewees to guarantee certain energy-related secondary and basic capabilities for the ones they were caring for, while they believed they could go without some of those capabilities, if it meant their energy costs would be reduced and thus manageable.

8.5 Conclusions

Meyer et al. (2018) understood perceived energy poverty as the situation in which "the household does not feel comfortable with its energy bill and its ability to heat its dwelling according to its own wants". This chapter focused on the impacts of energy poverty among older low-income Australians, extending the discussion on the perceived impacts of energy poverty for low-income older households, beyond the inability to heat the home adequately (Anderson et al., 2012; Wright, 2004). This study explored other perceived impacts of energy poverty and the energy practices and coping mechanisms of interviewees—not only for winter, but for summer temperatures and many other domestic services (e.g., cooking, showering, using the internet, etc.).

The interviews demonstrated the detrimental effects of energy poverty on the capabilities of older low-income people and corroborated previous studies (Melin et al., 2021; Middlemiss et al., 2019; Willand & Horne, 2018). The findings revealed the impacts of energy poverty on mental and physical health, and on the capacity of interviewees to consume essentials such as food, clothing, hygiene products, prescriptions and engage in recreational activities. Worrying about energy bills, cutting other expenses and, ultimately, compromising their quality of life made interviewees anxious, stressed and, in some cases, depressed. High levels of anxiety, stress and depression caused by high energy costs undermined their capacity to lead a joyful life. The thermal discomfort they experienced in their energy inefficient homes during summer and winter and the compromises on medical treatments that either required extra energy use or money they did not have, further affected physical health. The vicious cycle of social isolation and energy poverty cut off interviewees from family, friends, and support

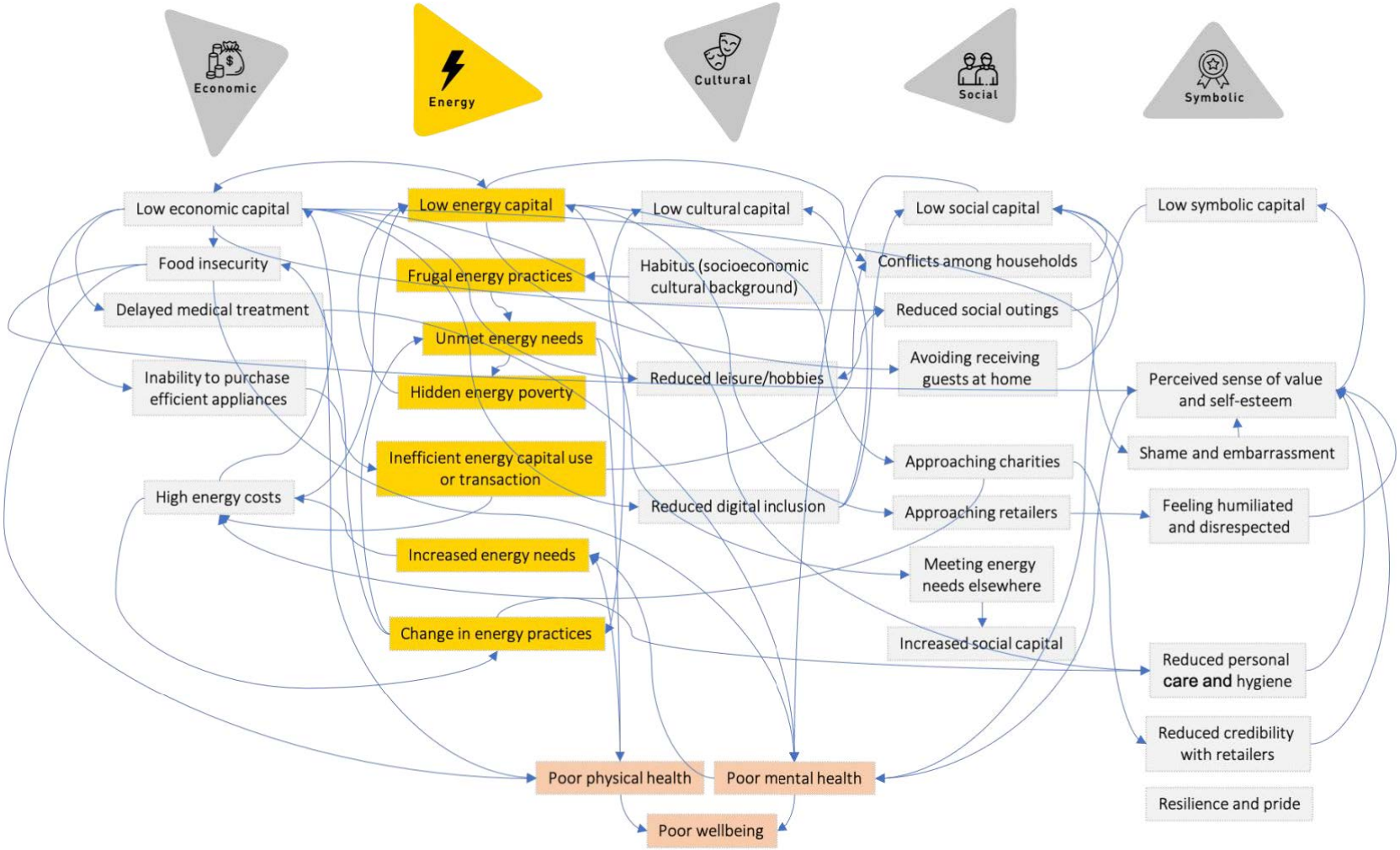
networks. The experiences of disrespect and humiliation when dealing with energy retailers made them feel powerless and worked towards silencing them even more.

The findings support the argument that energy poverty, as in low levels of energy capital, affect the acquisition and maintenance of the other forms of capital. It not only changes households' energy practices, further reducing their energy capital, but one of the main impacts is related to lower levels of economic capital, that cannot be transformed into the other forms (cultural and social). When an individual forfeits social outings to save money for energy bills, he or she is compromising on social capital, for example. Energy poverty can also directly affect the other capitals; if an energy-poor person changes their energy practices related to personal care and hygiene, this can affect their sense of esteem and self-respect. Figure 8.3 illustrates the myriad of energy poverty impacts.

Although it is not exhaustive, this diagram provides a map for understanding how energy poverty impacts relate to each other. Moreover, the diagram shows that some impacts are associated with the main drivers identified in Chapters 6 and 7, which suggests a worsening spiral of energy poverty problems. Ultimately, causes and impacts of energy poverty are constantly reinforcing each other to perpetuate this vicious cycle and reproduce inequality.

The analysis also investigated how these impacts affect older Australians' capabilities. Basic capabilities are severely affected. Energy poor older households lack the opportunities, resources and freedom to achieve valuable functionings, some as basic as being able to have a balanced and nutritious diet. This chapter provided evidence that Nussbaum's (2000) list of central capabilities associated with being able to have good health and bodily integrity, being able to socialise and enjoy recreational activities, being able to live not overwhelmed by anxiety and fear and being able to control one's environment, are often unachievable for energy poor Age Pensioners. Ultimately, as Figure 8.3 shows, the wellbeing of Age Pensioners is affected on many fronts.

Figure 8.3 - Diagram of impacts of energy poverty among older Australian Age Pensioners per type of capital



(Source: the author)

Older low-income energy poor households adapt their energy practices and sacrifice their thermal comfort for extended periods. Their habitus, as seen in Chapter 5, allows them to legitimate their reasoning around their frugal behaviour. Their low levels of economic and social capital make it difficult for them to alter their behaviour. In some of the circumstances portrayed, and also identified by Willand and Horne (2018), energy poor older low-income households may be putting their own health at risk because they neglect or fail to recognise their own vulnerability, pride, and frugality. This situation can be compared to Handy's (2012) "boiling frog" metaphor, in which imminent—but gradual—dangers go unnoticed to the point that they fail to take effective action at the ultimately threatening moment. As Jaju (2019) explains the concept behind the metaphor:

> *If a frog is suddenly put into a pot of boiling water, it will jump out and save itself from impending death. But, if the frog is put in lukewarm water, with the temperature rising slowly, it will not perceive any danger to itself and will be cooked to death. […] Since the frog is only slightly uncomfortable with its warm surroundings, it keeps trying to adjust and get accustomed, making itself believe that the slow, gradual change in temperature is normal. Only when the slow change suddenly starts accelerating does the frog realise it just signed its own death warrant. It has already lost its strength to jump out!*

By living in hidden energy poverty (sometimes hidden from themselves), and not recognising their own situation at present (or in the near future), they might be putting their physical and mental health at risk. Particularly with respect to a changing climate with more extreme weather events and higher temperatures, it is likely that they will not be able to cope as currently.

If energy-poor households do not realise they are living in energy poverty because they know no other reality, they probably would not feel the need to access assistance. In terms of policy implications, this reiterates the limits of placing the responsibility on vulnerable citizens—who face major limitations in their capabilities to do so—for realising their own situation and getting assistance. In other cases, it may be too challenging, bureaucratic or humiliating for them to seek help. There is a need to destigmatise energy poverty, so that people experiencing it do not feel embarrassed or choose to deny their situation due to pride. Destigmatising energy poverty can also help bring hidden aspects of it to light.

Chapter 9 Conclusions

Introduction

This chapter restates the research questions (Section 9.1), followed by a summary of the main findings (Section 9.2), which encompass the extent, the causes, and the impacts of energy poverty among older low-income Australians. Next, I present the key research contributions (Section 9.3), highlighting the significance of the new knowledge produced in terms of empirical contributions and theory advancement. The in-depth evidence on how older Australians experience energy poverty has numerous policy implications, and I offer insights and practical recommendations. I acknowledge the research limitations in Section 9.4 and propose ideas for a future research agenda (Section 9.5) that engages with the questions this study has opened up. The chapter ends (Section 9.6) with reflections on the research process.

9.1 Revisiting the research questions

Despite a consolidated research topic in Europe, energy poverty is still under-researched and often vaguely understood in Australia (ACOSS, 2018; VCOSS, 2018). There is limited evidence on the lived experience of energy-poor households and what pushes them into this situation. The impacts of energy poverty are almost exclusively connected to thermal discomfort in winter and lack a more holistic understanding of the health and wellbeing implications. There is more to be exposed on the Australian contextual causes and impacts of energy poverty. Therefore, the primary aim of this study was to explore energy poverty among a particularly vulnerable group; older Australians with low incomes. The main research question was; *How is energy poverty understood and experienced by older Australians reliant on government income support?* Four sub questions were posited:

1. To what extent do older Australians reliant on government income support suffer from energy poverty?
2. What are the current housing conditions of older Australians reliant on government income support and how might they shape their experience of energy poverty?
3. What are the main causes of energy poverty among older Australians reliant on government income support?
4. What is the impact of energy poverty on older Australians reliant on government income support?

9.2 Summary of findings

9.2.1 The extent of energy poverty among older Australians

Measuring energy poverty is dependent on its adopted definition and highly subject to data availability (Anagnostopoulos et al., 2016; Culver, 2017). Different energy poverty indicators capture different vulnerabilities and, therefore, different groups of energy poor households (Siksnelyte-Butkiene et al., 2021). Studies in Australia that have endeavoured to measure the extent of energy poverty are inconclusive. Some studies conclude that between 2% and 5% of Australian households experience energy poverty (see Churchill & Smyth, 2021), while Azpitarte et al. (2015) estimated that 29% of Australian households do. Other reports have in-between percentages (Nance, 2013; VCOSS, 2018). These massive differences illustrate the difficulty of measuring energy poverty and the differences obtained using different measures. In this study four consensual indicators (Tirado-Herrero, 2017), taken from the AHCD survey, were utilised as a proxy for energy poverty and combined to provide an index. The findings indicate that 7.5% of Age Pensioners suffered energy poverty by at least one indicator, the most common being the inability to keep comfortably warm in winter.

No previous study has used the AHCD to measure energy poverty in Australia nor focused solely on older Australians, and therefore a direct comparison is not possible. A similar proportion of 7.5% has been found by VCOSS (2018), in which consensual measures of energy poverty from the HILDA data were used to measure persistent energy hardship among Australian households. However, Churchill and Smyth (2021) found that objective measures, such as the LIHC, provide a greater proportion of the sample being in energy poverty in Australia. Azpitarte et al. (2015) have identified that older Australians accounted for a larger proportion of energy poor households when measuring income-expenditure indicators, which were not possible in this study, as the AHCD survey does not include questions on energy expenditure.

This study searched for possible associations between energy poverty and socio-demographic characteristics of people reliant on the Age Pension for their income. Income plays a pivotal role in the experience of energy poverty. Therefore, older low-income households are far more likely to experience energy poverty. Factors such as being a low-income older private renter, or a lone person older household were also more strongly associated with the experience of energy poverty in the bivariate analysis. Although a small

proportion in the AHCD sample, households living in poorer quality homes in need of repairs experienced energy poverty in greater percentages than those living in good quality homes. Similar evidence was found by Liu et al (2019).

The quantitative data analysis pointed to how health, home and energy poverty are intertwined, corroborating previous research (Churchill et al., 2020; Liddell & Morris, 2010; Thomson et al., 2017). Older renters assessed their health poorer than homeowners, and suffered mental health issues such as anxiety, depression, and stress in much higher numbers. It was possible to correlate the experience of energy poverty with mental health issues, such as anxiety, depression, and stress. These topics were further explored in the interviews, providing more details about this complex relationship.

9.2.2 The causes of energy poverty among older Australians

The interviews with energy poor older households utilised Bourdieu's concept of capital (2002) to explore the drivers of energy poverty beyond the triad of low incomes, high energy prices and poor energy efficient homes (Boardman, 2010). The research evidence supports the argument that many contextual factors related to low levels of economic, cultural, social and symbolic capital overlap and interfere with each other to push older low-income households into energy poverty, i.e., low levels of energy capital.

The interviews allowed me to analyse how factors related to housing tenure and housing conditions, such as lack of (agency for) dwelling maintenance, inadequate building envelope, old and inefficient appliances and hot water systems and building design compromised interviewees' capabilities to feel comfortable at home and also their energy consumption practices. Additionally, interviewees indicated that issues with energy retailers resulted in higher energy bills despite efforts to reduce consumption.

Overall, a misguided understanding of the energy field "game rules" and the energy confusopoly—a word coined by Adams (1997) to define a market in which competitors purposefully confuse customers instead of competing on price—perpetuate the difficulty to engage with energy retailers. Interviewees distrusted energy retailers and their low levels of the required cultural capital (including energy literacy) made it difficult for them to operate in this field. While resourceful costumers, embodied by Strengers (2014) as the Resource Man, can take advantage of many retailers and energy offers available, for the majority of vulnerable

consumers, the current energy market design is flawed and, in many cases, worsens energy poverty.

Other causes, more specific to this type of vulnerable household were also examined. These included the lower levels of computer literacy and digital inclusion, the lower levels of social capital, the gender factor, and health-related issues. Lower levels of computer literacy and access to the internet reduced their chances of obtaining information on better energy offers as the energy market is mostly online (with very few face-to-face opportunities for those who need it). It is also a sign of symbolic violence; it excludes those who are already marginalised.

Speaking of marginalised people, the findings in this research corroborate previous studies overseas on the gender related factors with respect to energy poverty (Petrova & Simcock, 2019; Robinson, 2019). Due to a combination of reasons, women tend to retire with significantly less savings than men (WGEA, 2017). It is known that older Australian women are among the poorest households in Australia (Wilkins et al., 2020). In addition, an overlap of numerous vulnerabilities and intersectionalities (Crenshaw, 1991; Grossmann & Kahlheber, 2018), such as quitting a job to care for a family member, becoming unemployed at an advanced age, overcoming abusive relationships, and becoming a widow, result in lower levels of all types of capital, severely restricting the capabilities female Age Pensioners can achieve with respect to acquiring adequate levels of energy capital. In contrast with the Resource Man (Strengers, 2014), I suggest a diametrically opposed "persona"– the Unresourceful Senior Woman.

Lastly, diverse health related issues among older Australians were identified, which can both increase energy needs and reduce capabilities to cope with energy poverty or overcome it. Since interviews were conducted during the global COVID-19 pandemic, interviewees also mentioned how the lockdowns and the economic crisis affected their ability to cope with energy costs.

9.2.3 The impacts of energy poverty among older Australians

The study findings complement previous Australian studies (Cooper et al., 2016; Willand & Horne, 2018) on the detrimental impacts of energy poverty among older low-income households. The diverse range of effects on the household's health and wellbeing—from bill anxiety to exposure to unhealthy indoor temperatures and social isolation—also accord with

studies abroad (Baudaux et al., 2019; Chard & Walker, 2016; Liddell & Morris, 2010; Longhurst & Hargreaves, 2019; Zhang et al., 2021). The conceptualisation of those impacts as to how they relate to each form of capital (economic, cultural, social, symbolic, and energy) support the argument proposed that Bourdieu's theory is a useful framework for understanding energy poverty. The low levels of energy capital experienced by energy poor households affect the acquisition and maintenance of the other forms of capital - noticeably, it results in lower levels of economic capital that cannot be transformed into the other forms (cultural and social).

It is known that lower levels of thermal comfort at home is directly related to energy poverty (Boardman, 1991; Rudge & Gilchrist, 2005; Thomson et al., 2019). Furthermore, this study presented evidence that other common energy practices are impacted to an extreme level, such as avoiding using an oven or a hairdryer. The stress to which households are subjected when they have to constantly think about every potential energy consuming action at home is overwhelming and mentally draining, supporting Petrova and Simcock's (2019) idea that living in energy poverty means additional emotional labour. The analysis of interviewees' energy bills indicated that energy poor older Australians have much lower energy consumption patterns compared to the average Australian household, which confirms previous surveys (ABS, 2012a).

Besides the toll on their mental and physical health, prioritising paying their energy bills impacts on their capacity to consume other essentials, such as nutritious food (providing further evidence of the nexus between energy poverty and food insecurity, as seen in Cook et al., 2008; Nord & Kantor, 2006), clothing, hygiene products, medical expenses, and recreational activities and social outings. The vicious cycle of social isolation and energy poverty further excluded households from family, friends, and support networks, impeding opportunities for getting assistance.

Low energy capital begets lower levels of other forms of capital that severely diminish older households' capabilities and their capacity to lead a life they value. The evidence reveals that older low-income Australians have unfulfilled energy-related secondary capabilities, such as not being able to feel thermally comfortable at home, not being able to cook or shower properly, and not being able to use entertainment and technology related services due to unaffordable energy costs (Day et al., 2016). Those unfulfilled secondary capabilities largely affect, directly or indirectly, basic ones. In the light of Nussbaum's (2003) list of ten central capabilities, it was possible to associate energy poverty with the lack of at least seven key

capabilities, including the capability of living a life worth living, being able to have good health and bodily integrity, not being blighted by overwhelming fear and anxiety, being able to socialise and enjoy recreational activities and being able to control one's environment. As concluded, the overall lack of capital caused by low energy capital undermined interviewees' abilities, opportunities and freedoms to lead a decent and pleasant life. Ultimately, causes and impacts of energy poverty are constantly reinforcing each other to perpetuate a vicious cycle of disadvantage, deepen inequality and curtail essential capabilities.

9.3 Research contributions

Bourdieu (1990b, p. 2) advises that "a humbler and more responsible way of performing [one's] task as [a] researcher" is to integrate theoretical and practical intentions in the study, merging the scientific work into its ethical and political contributions. Therefore, the research contributions are organised under three topics: empirical, theoretical and practice and policy implications.

9.3.1 Empirical contributions

There are important empirical contributions to be acknowledged. Previous studies have touched on energy poverty among older homeowners in Australia in the context of retrofit interventions or in regards to the inability to heat the home (Cooper et al., 2016; Willand & Horne, 2018). In another study, Waitt et al. (2016) suggested the "tyrannies of thrift" among older low income households with respect to energy use at home. Nevertheless, this is the first Australian study to examine it in detail, adding knowledge to the emerging literature. This is a pioneer study focused solely on exploring the lived experience of energy poverty among older low-income households and the diverse nuances of energy poverty (not only related to winter temperatures) in different housing tenures.

The findings question the previously held view that energy poverty is mostly experienced during winter (Daniel et al., 2019; Hitchings et al., 2015). There is robust evidence to suggest that the usual formulation of energy poverty as mostly an inability to heat the home is problematic for two reasons. Firstly, it fails to acknowledge the precarious situation of other important deprived basic energy services—such as cooking, showering and entertaining—that energy poor households experience throughout the whole year (as also investigated by

Simcock et al., 2016; Walker et al., 2016). Secondly, it fails to recognise the current and potential future dangers of heatwaves among heat vulnerable households, who can also be energy vulnerable (Nicholls et al., 2017b). The interviews revealed that older low-income Australians have their health and quality of life severely affected by the thermal discomfort experienced in summer. Furthermore, they are not equipped or cannot afford appropriate cooling devices to cope with the temperature extremes predicted in coming years. The rise in temperatures caused by global warming are now irreversible (IPCC, 2021) and adaptation is urgently needed. The findings in this study provide insights into how policy frameworks can improve the capabilities of older Australians to overcome the effects of unhealthy indoor temperatures.

Another original empirical contribution is the use of the AHCD survey for measuring energy poverty. While most studies in Australia use the consolidated HILDA survey (Churchill et al., 2020; Munyanyi et al., 2021; Poruschi & Ambrey, 2018), which enables energy poverty longitudinal panel studies and income/expenditure approaches, there is a lack of information on housing conditions that might contribute to energy poverty. The present study tested a new dataset on the Australian housing conditions. The AHCD has been used for understanding housing quality and perceptions in other studies (Liu et al., 2019; Viljoen et al., 2020), but not in respect to energy poverty and older Australians. The findings in the present study have shown the many correlations between energy poverty, housing conditions and households' health, thereby opening a new research agenda on the use of AHCD and its future additions for understanding energy poverty, households' characteristics and their housing conditions and perceptions.

The inductive approach used in this research, particularly towards the qualitative data, meant moving from specific instances to broader conclusions. Although there will always be a degree of uncertainty (Singleton & Straits, 2018), the evidence of the dire situation and capability deprivation experienced by low-income older Australians strongly accords with previous research and adds to it (Morris, 2016; Morris et al., 2021; Willand et al., 2017). Moreover, it adds to the broader emerging literature on the contextual vulnerabilities that push households into energy poverty (Robinson et al., 2018b; Simcock et al., 2018). Moving beyond the triad of high energy prices, low incomes and poor home energy efficiency (Boardman, 2010), this research supports the view that there are many other cultural, generational, and structural factors that influence energy poverty and the capabilities for

overcoming it. Overall, the issue of energy literacy among older Australians and the understanding of energy literacy as important for energy poverty research was a topic that needed to be examined. The interviews demonstrated that energy-literate Age Pensioners were generally able to choose better energy plans and have lower energy costs, reducing the severity of their energy poverty situation.

A novel discussion was the emerging issue of hidden energy poverty (Karpinska & Śmiech, 2020; Meyer et al., 2018) among this vulnerable group of households. Drawing on Bourdieu's concept of habitus, it reveals a new perspective (adding to the work on the "tyranny of thrift" by Waitt et al., 2016) on the generational and cultural factors that shape their frugal behaviours and pride in adapting to necessity. Nevertheless, the effort to deny their own situation or adapt without being aware of potential dangers resembles the boiling frog metaphor (Handy, 2012), bringing to light the challenge in reaching older energy-poor households and helping them improve their capabilities and livelihood.

The findings also support the idea that despite all the adversities they faced, some interviewees were extremely resourceful and resilient. These factors had a significant impact in their experience of energy poverty. The few interviewees who had higher levels of digital and energy literacy, like Denise and Daniel for example, were able to get more 'value for money' with suitable and competitive market offers. Others who had higher levels of social capital were able to leave the home for social activities and get assistance from family and friends. Most importantly, the resourcefulness of some interviewees was reflected mainly in their mindset and the way they perceived themselves (their symbolic capital and self-respect) while coping with energy hardship.

In addition, whilst a small number of interviews, the findings in this research add to the emerging literature of gender and energy poverty research in developed countries (Petrova & Simcock, 2019; Robinson, 2019). The indicative findings, which can be further explored in future research, suggest that lower savings and income, widowhood, experience of abusive relationships, and lower levels of cultural capital can potentially contribute to older women experiencing energy poverty differently and to a greater extent than older men.

Lastly, this research had the opportunity to examine the consequences of the COVID-19 pandemic. This study has shown how the pandemic has aggravated energy poverty among older Australians. As older people are at greater risk of severe COVID symptoms, the self-imposed restrictions to living life as before COVID extended beyond government guidelines

and timeframes. Those self-imposed restrictions not only affected energy consumption patterns at home and consequentially energy costs, but also their capacity to cope in alternative ways with energy poverty.

9.3.2 Theoretical contributions

The major theoretical contribution of the study is the new conceptualisation of energy poverty. Using Bourdieu's theory (1977, 1990b) in energy poverty research is novel. Although previous researchers have noted the importance of social capital with respect to energy poverty, they have not drawn on Bourdieu's conceptual framework (Churchill & Smyth, 2020; Reames et al., 2021). This study used Bourdieu's concepts of field, capital, habitus and symbolic violence to understand the energy market as a social field (Bourdieu, 1985). The importance of the four main types of capital (Bourdieu, 2002) for engaging with the energy field and being able to maintain sufficient levels of energy consumption was discussed. In addition the significance of the habitus (Bourdieu, 2005) in shaping people's expectations when in energy poverty, and the symbolic violence (Bourdieu & Nice, 1993) that happens in the energy field to reproduce and perpetuate the existing inequality in the field of power was demonstrated.

In this research, I offer the novel conceptualisation of energy capital, a valuable concept that has major usability in the current context of energy transition (Liu et al., 2017; Sunderland et al., 2020). Understanding energy as a valued and limited resource in the energy field is aligned with the future trends of decentralising energy generation and profiting from it. I argue that energy poverty can be broadly understood as an issue of low levels of energy capital caused by low levels of the other forms of capital (economic, cultural, social and symbolic). There is sufficient evidence from previous research to link low economic capital, as in low income and wealth, to energy poverty, but this study also discussed how the other forms of capital can contribute to energy poverty. Additionally, Bourdieu's conceptualisation of capital (Bourdieu, 2002) is generative for grasping how drivers and impacts of energy poverty related to the many forms of capital are intertwined in a complex network, as seen previously. It has been argued that understanding energy poverty via Bourdieu's lenses encompasses current theorisations of energy poverty and complements them (Grossmann & Kahlheber, 2018; McKague et al., 2018; Stephenson et al., 2015), providing a more general framework with useful concepts to energy poverty research.

Bourdieu's emphasis on the influence of habitus on people's aspirations and expectations (Bourdieu, 2005; Dillon, 2019) is especially useful to my analysis, as it allows one to think through the cultural, socio-economic and generational factors that explain how older low-income households experience hidden energy poverty. It is also through Bourdieu's concept of symbolic violence, that I discuss the many ways in which agents in the energy field perpetuate the inequality that impede energy poor households of overcoming it: the intentional confusion of customers in the confusopoly mechanisms, the lack of proper forms of communication and engagement with senior households, and the heavy reliance on digital platforms that exclude those who are not computer literate or have no easy access to the internet.

Using the capabilities approach (Nussbaum, 2000; Sen, 1999), together with Bourdieu, made it possible to recognise how the many forms of capital can be seen as resources used to guarantee central capabilities to human wellbeing. The capabilities approach has been a useful theoretical framework in energy poverty research (Day et al., 2016; Middlemiss et al., 2019; Willand et al., 2021) and housing research (Harris & Mckee, 2021; Irving, 2021; Morris, 2009). The present research develops the theory by connecting it with Bourdieu's and advances it by providing further evidence of how energy poverty and the housing conditions of older low-income Australians affect their secondary and central capabilities.

9.3.3 Practice and policy implications

Besides the empirical and theoretical contributions outlined above, this research offers practical recommendations and inputs for policy changes in regard to recognising and fighting energy poverty in Australia. As an emerging issue that is very likely to be aggravated by climate change, the alleviation of energy poverty requires a range of policy interventions. Ultimately, providing adequate, affordable, and accessible resources for all households so that energy poverty is eliminated, should be a government goal. Solutions need to be focused on empowering consumers and improving their capabilities. Willand et al. (2021) used the capabilities approach to evaluate energy vulnerability policies and initiatives in Victoria. They concluded that most initiatives are designed as isolated measures rather than holistic interventions that effectively provide transformative agency.

A holistic approach that encompasses both immediate and longstanding interventions could have the five forms of capital as a general framework: how to improve the economic,

cultural, social and symbolic capital of households so that they have affordable access to energy capital? Hence, I propose below some implications for practice and policy based on the evidence in this research.

Immediate practice and policy implications

As Bourdieu (1999, p. 629) argues:

> *Producing awareness of these mechanisms that make life painful, even unliveable, does not neutralise them; bringing contradictions to light does not resolve them. But […] one has to acknowledge the effect it can have in allowing those who suffer to find out that their suffering can be imputed to social causes and thus to feel exonerated; and in making generally known the social origin, collectively hidden, of unhappiness in all its forms, including the most intimate, the most secret.*

The lived experience of energy poverty shared in this research reveals the embarrassment, shame, and stigma that households feel. There is an urgent need to destigmatise energy poverty and the "muted violence of everyday life" that comes with it (Bourdieu, 1999). Similar to campaigns on domestic violence and harassment, bringing awareness of energy poverty to light might help people recognise their situation, not feel alone and overcome it with the proper assistance. Even though there are many immediate relief schemes for energy hardship, they are not known by those who need it the most. Destigmatising energy poverty and making sure energy poor households know they are not responsible for their situation will improve their sense of value and symbolic capital. In turn, this can potentially enable more "energy conversations" to happen, allowing people to enhance and strengthen their social capital and facilitate the process of identifying hardship and receiving assistance.

This research has shown that many Age Pensioners do not realise the potential dangers of energy poverty or opt not to seek assistance or have no idea that there are support options available. In terms of policy implications, destigmatising the phenomenon can reveal the extent and impacts of energy poverty. Awareness campaigns must be tailored to the diverse vulnerabilities and inequalities that energy poor households face (Grossmann & Kahlheber, 2018). For instance, older energy-poor households might have limited access to internet, so relying on online awareness information and support is ineffective for a proportion of this vulnerable group.

In addition, their careful strategies to reduce energy consumption corroborates the fact that their energy patterns are not comparable to an average household. Therefore, targeted approaches towards energy efficiency programs should be developed for this specific vulnerable group. The appliance replacement initiative from the NSW government, which used to offer between 40% and 50% discounts on the replacement of fridges and TVs, has now ended (in June 2021). Considering that many energy-poor households go without heating and cooling at home, it is likely that the fridge energy consumption represents a bigger proportion than the 8% found in the average Australian household (DIS, 2015). Therefore, promoting and facilitating the substitution for more energy efficient domestic appliances is something that should be extended to other types of domestic appliances, such as microwaves, ovens, portable heating and cooling devices, rather than discontinued. In addition, apart from trying to address only the materiality (energy efficiency of the device), I would suggest that, inspired by the work of Spurling et al. (2013), public policy could build households' capabilities to enable a shift in everyday energy practices to be less resource-intensive, addressing the competence and the meanings of the practice as well. The interviews have shown that, although participants were extremely conscious of their energy usage, sometimes they did not have the knowledge to make good and informed decisions about energy usage. For those under TOU tariffs, for example, the moment when the energy practice is performed make a substantial difference to its cost. Knowing when energy is cheaper, in this case, could perhaps enable a change in the energy practice. In regards to older Australians with underlying health conditions, energy use can be increased due to health needs. Interviewees have reported that, besides advancing age, hypertension, pneumonia, and heart disease all impacted their thermal comfort needs, and, therefore, their energy costs. At the time of writing in late 2021, the NSW government has a Medical Energy Rebate (up to a total of AU$285.00/year) for eligible recipients who have an inability to self-regulate body temperature. However, like the Low-Income Rebates or the EAPA vouchers, this type of concession is not well known. In addition, it can only be assessed by those who have severe health issues, such as severe spinal cord injury, brain injury, advanced peripheral vascular disease, and advanced multiple sclerosis – all combined with secondary qualifying criteria. I argue that this type of concession should be broadened for low-income older households to include other less severe health conditions that also affect energy usage (e.g., urine and bowel incontinency needing greater hot water usage for disinfecting bed linen, towels and clothing). This suggestion is in accord with recent

research that advocates for energy support and assistance as part of health care provision (Sherriff et al., 2020; Willand et al., 2019).

With respect to accessing renewable energy and transitioning into a more decentralised energy grid, policies should prioritise older low-income households who are more likely to under-consume energy and may feel the upfront investment and the payback period is too long for them to benefit from it. Providing access to renewable energy addresses decarbonisation of the energy system and elimination of energy poverty simultaneously. While at the moment there is a "solar for low-income households" trial in NSW, it only covers up to 3,000 low-income households and those selected must agree not to receive the low-income energy rebate for ten years, which can be a difficult decision to make. Older households who spend most of their time at home can benefit from solar energy, but perhaps this transition should be more gradual, such as reducing the energy rebate with time if the solar panel is proving to provide enough electricity for the household. It might be the case that, in certain locations, during winter, a combination of solar energy and rebate will be necessary.

Although there is limited evidence in Australia, European studies have revealed that fixed supply charges result in low energy users paying more in proportion to their use of the network than high energy users (Sunderland et al., 2020). This could be understood as another form of symbolic violence in the energy field, where disadvantaged households are further disadvantaged. In some states, such as Victoria, there is a rebate for low-income households with low energy consumption, but significantly higher supply charges. This rebate equalises supply charges to the actual energy usage costs, which means supply charges will, at best, represent 50% of that household bill.

As the findings in this study clearly show, supply charges are a big proportion of older low-income households' energy costs and reducing it to 50% of the bill is not a major benefit for them. I suggest that this scheme should be nation-wide and, for low-income households with such low usage, supply charges could be further and proportionally reduced, as in the volumetric energy component scheme, where supply charges are distributed to consumers in a more equitable manner, based on their energy use. Sunderland et al. (2020) provides a successful case study of this application in Stuttgart (Germany). For example, if an average household in the suburb area has a daily energy consumption of 10kWh and the average supply charge applied by the retailer is AU$1,00/day, if a low-income household has an energy consumption 4kWh/day, then the supply charge could be reduced to AU$0.40/day. On the

other hand, if wealthy households perhaps have an energy consumption of 14kWh/day, then their supply charge should also increase to AU$1,40/day. This would both aim at educating wealthy households to reduce their energy consumption and carbon footprint, while rewarding those who already do that out of complete necessity.

Another important immediate policy measure should ensure good energy retail practices across Australia. The Victorian Essential Services Commission, for instance, requests that energy retailers in Victoria tell their customers how much they could be saving by switching to the best energy plan they offer. This action helps customers navigate the "confusopoly" of offers. Yet, this is not required in other Australian jurisdictions. In an attempt to simplify Australian retail energy bills and standardise an accessible format for information that must be provided to customers, a rule change request was submitted in 2020, on behalf of the Australian Government (which led to the mandatory Better Bills Guideline developed by the AER, 2022). Considering that the energy system is becoming increasingly complex, as detailed in Section 3.2, making sure that energy bills are easy to understand can increase customers' ability to make informed decisions. However, the "Better Bills Guidelines" does not cover the whole of Australia.

Lastly, the AER has also developed a draft (for consultation) for a Consumer Vulnerability Strategy (AER, 2021a). Market bodies such as the AER and the AEMC must take advantage of existing scientific research, such as the present one and others referenced in this thesis, to better understand what energy vulnerability looks like for different types of households. Secondly, the AER needs to enforce an increase in the responsibility of energy retailers in identifying and providing support to energy poor households.

Medium-term practice and policy implications

As this research has argued, measuring energy poverty is a challenging task. Besides different data sources providing different measures, different understandings of energy poverty among Australian researchers result in different indicators being used. Therefore, I suggest that, in the medium term, Australian researchers, policy advocates, community partners and government bodies unite to create an observatory of energy poverty in Australia, based on the model of the European Energy Poverty Observatory (EPOV, 2019) and the Energy Poverty Advisory Hub (Climate Alliance, 2021).

The Australian Energy Poverty Observatory (AEPO) could tackle efforts to improve the measuring of energy poverty across all States and Territories, including the development of specific surveys and more useful indicators that are in accordance with Australians' current and future needs, which will most likely be shaped by climate change. There is a need to improve national survey instruments to capture the varied nuances of energy poverty as researchers start learning what they are through the qualitative data. I agree with Willand et al.'s (2021) argument that there is a need to reframe energy-related survey questions in more appropriate ways, such as using the language of capabilities. In the 2012 version of the HECS (ABS, 2012a), specific energy-related financial stress indicators were included along the usual inability to pay bills on time and the inability to heat home[74]. However, those specific indicators were discontinued in the following Household Expenditure Survey (ABS, 2016b). Perhaps bringing those indicators back might help identify energy vulnerability. An additional suggestion: households could be asked what they would do differently with their money if they did not have to worry so much about their energy bills. Better indicators will provide greater insight into the complex and multi-dimensional factors associated with energy poverty.

At the time of writing in 2021, energy poverty research is strongest in the state of Victoria. Little research has been conducted in locations such as Tasmania and the Northern Territory, which experience winter and summer extremes. Mapping and monitoring energy poverty across Australia needs to be a national effort and the AEPO would be very useful in benchmarking research from Victoria to other Australian States and Territories[75] while acknowledging the different climate conditions and socioeconomic characteristics that each State or Territory is exposed to. Unifying Australian energy poverty research and expertise into the AEPO could facilitate dissemination efforts of best practices and strengthen policy guidelines across all three levels of government – federal, state and local.

A second medium term practice change urgently needed is related to increasing opportunities for households to improve their energy literacy, especially energy poor households with limited access to the internet. Improving their energy literacy and their ability

[74] They comprised of the need to enter a loan arrangement or use a credit card to pay the electricity or gas bill, the need to receive assistance from electricity or gas company to pay bills, receive a disconnection warning from electricity or gas company or have the services disconnected, chose to restrict heating or cooling home to avoid extra costs, and inability to afford to repair a heater, air conditioner or a major household whitegoods.

[75] Mainland Australia consists of six federated states (New South Wales, Queensland, South Australia, Tasmania, Victoria, and Western Australia) and two federal territories (the Australian Capital Territory, and Northern Territory).

to engage with the energy market requires building trust over time and consolidated social networks. As mentioned previously, low-income older households are likely to lack social capital and are considered "hard to reach". Therefore, it is important to take advantage of their existing and trustworthy social relations. Some older Australians still use Australia Post to pay their energy bills. Hence, energy literacy initiatives should be focused on such places that are already frequently visited and known by them. During the early stages of the research, before COVID, I visited some community centres that held special activities for Seniors. Perhaps, energy literacy sessions could be conducted in these venues, so that older households know what to expect in their bill and the know-how to change their energy plan to a more affordable one. This suggestion can not only build their capabilities to engage with an increasingly complex energy sector but also expand their social capital by strengthening existing trustworthy relationships.

Other similar community-run initiatives, as in the example of the Energy Cafés in the United Kingdom (Martiskainen et al., 2018), could be supported with local government grants. Another successful overseas example is the SUITE (Scaling Up Innovation Together for Energy Vulnerability) project, where social operators, named Household Energy Advisors, not linked to the energy market companies, promote empowerment and vulnerable consumers' participation in the energy market by increasing their energy literacy and ability to exercise their energy rights (ASSIST, 2021). This project is active in five European countries (Spain, Italy, Poland, Hungary, and Romania) and could be a benchmark for Australia. It should be stressed that improving energy literacy is important, but it will not solve the problem alone. It is unfair to place those vulnerable households as responsible for their high energy costs due to lack of knowledge, time, resources and capital to individually and actively engage with their retailers for better offers. The way the Australian energy market operates needs to change to prevent this form of symbolic violence from happening and this should be on the agenda of the national energy governance, mainly the Australian Energy Regulator and the Australian Energy Market Commission. The confusopoly of the energy field needs changing to ensure more accessible and inclusive participation of energy vulnerable households. More importantly, it needs to consider that not everyone wants to, or can, engage with the energy market in a level playing field, like the "Resource Man" (see Sections 6.3.1 and 7.1).

There are scattered initiatives of market change in Australia. In 2020, during the COVID-19 pandemic related lockdowns, ActewAGL (Canberra's local electricity and gas provider) got

legal approval to automatically move customers facing energy hardship from standing offers (usually more expensive) on to the cheaper energy plans, recognising not all customers have the same capabilities to seek and find better energy offers. This not only reduced hardship for consumers, it also lowered the numbers of customers in debt, proving to be a win-win situation for the retailer[76]. Making sure customers experiencing payment difficulties and energy hardship are placed onto the cheapest tariff available should be a responsibility of energy retailers with regards to consumer protection. Recognising the wide spectrum of profiles ("personas") of energy users, especially the vulnerable ones, can provide insights into a more just and inclusive system. The findings suggest a contrast to the "Resource Man" – the "Unresourceful Senior Woman" – but, of course, there are many other "personas" to be accounted for, such as the "Single Mum of Three" or the "International Student in Crowded Home". Transitioning to a further distributed energy grid needs to be carefully planned so that energy-poor households are not excluded.

Long-term practice and policy implications

Lastly, more attention should be given to the design and construction of dwellings that can facilitate lower energy demand. While there is a focus on thermal insulation and the energy efficiency of systems, other aspects of the dwelling design need to be reassessed, such as natural ventilation, daylight exposure and limitation of draughts. As the interviews have shown, open plan designs end up reducing energy-poor households' abilities to feel comfortable at home. They cannot afford to heat or cool the entire area, and, in some situations, change the use of spaces at home (making the bedroom the main living area) to acquire thermal comfort. A more comprehensive policy framework towards the design of dwellings that promote health and wellbeing (such as the ones suggested by Foster et al., 2020) would also address energy poverty related-factors.

The study's findings illustrates the importance of a mandatory disclosure of energy efficiency in existing dwellings, especially rented dwellings (ACOSS et al., 2017; Daniel et al., 2020; Liu et al., 2017). Home energy efficiency does not need to be a complex and difficult to understand matter for households. It should be straightforward and inform future tenants and owners on their potential energy costs. Special attention should be given towards incentives

[76] Information obtained in personal communication with a staff member of ActewAGL in September 2020.

for lower-income submarkets (Liu et al., 2019) that are often of poor quality and occupied by older households (Easthope et al., 2020). As Willand et al. (2020, p. 14) argue, there is an issue of retrofit poverty in Australia—as in "the inequality of opportunity to improve the energy performance of the home"—that reinforces energy poverty among those vulnerable households.

Adding to that, Liu et al. (2018) emphasise the importance of improving housing energy efficiency to minimise household carbon-intensive activities (e.g., heating) and reduce demand from power supply. To improve the efficiency of the Australian housing stock and achieve net zero by 2050 (ClimateWorks Australia, 2020), it is essential to know where Australia stands. While there is no mandatory disclosure, researchers can only estimate the real inefficiency of the stock (Rajagopalan et al., 2018; Sustainability Victoria, 2014). Government initiatives towards disclosing and improving the energy efficiency of existing social housing in Australia could be the initial trigger of a net-zero revolution in the whole housing sector while boosting the economic recovery post-COVID.

9.4 Limitations of research

There are limitations to this study that should be noted. The AHCD survey, although very informative, is limited in that it encompasses only consensual (subjective) indicators of energy poverty, with no variables on income/expenditure measures. Previous data (Azpitarte et al., 2015) has shown that older low-income Australians are more likely to be identified in income/expenditure approaches, so the quantitative analysis is limited to the existing variables in the dataset. There are limitations in terms of the analysis that was carried out on the data. The statistical analysis focused on descriptive and simple bivariate correlations. Regression analysis, other methods of multivariate analysis, and inferential statistics can be developed in future research. With further multivariate analysis, it might be possible to ascertain which explanatory variables described above have the most explanatory power with respect to strength of association with energy poverty indicators.

With respect to the qualitative data, interviewees' recruitment was severely limited by COVID. As explained in Chapter 4, the initial recruitment efforts were offline, so that older low-income households with limited access to internet could become aware of the research. The lockdown measures imposed during COVID meant all recruitment efforts had to be digital and

through gatekeepers. Not only did it take much longer than expected to reach a reasonable number of interviewees, but the interviews had to happen via phone, limiting the opportunity of capturing non-verbal communication and other types of information that could be collected, such as a detailed account on the dwelling characteristics. In addition, it was more difficult to build rapport with phone interviews, and some interviewees chose not to share their energy bills, reducing the depth of analysis I could make in those cases.

In qualitative research, particularly using thematic analysis, it is important to realise the limitations of the researcher, the method, and the inherent bias. As Bourdieu (1999, p. 622) noted, even the transcription process imposes limitations: "the transition from the oral to the written, with the changes in the medium, imposes infidelities." The interview cannot be reduced to what was merely recorded, but resource limitations in terms of time and research abilities naturally impose restrictions into what can be analysed. Lastly, there is the researcher bias; a bias, or, why not, a habitus, shaped by my socio-economic and cultural backgrounds, my previous life experiences and familiarity with the research topic, my own practices towards lower energy consumption and lower costs and my intentions within the research. Nevertheless, clear protocols on data collection and analysis, triangulation in a mixed methods research, reference to the existing literature and a comprehensive supervision process minimised that bias in the search for robust evidence and logical reasoning.

9.5 Recommendations for further research

This exploratory in-depth study has opened avenues for future research on energy poverty in Australia on several fronts. Firstly, the situation of older low-income Australians deserves a lot more attention and understanding their needs when it comes to engaging with the energy field is of extreme relevance. Therefore, there is potential for further research work to include participatory action research methods that emphasise direct collaboration with those older Australians experiencing energy poverty for the purpose of outlining feasible and functional solutions for this specific group. Participatory processes have been proven valuable in understanding people's basic (and contextually different) energy needs and important matters of "justice as recognition" (Day, 2021; Walker et al., 2016).

Secondly, understanding the energy poverty impacts on the health of older Australians, particularly during summer, can be further investigated with the use of direct measurements

that include biometric sensors and indoor monitoring devices. Moreover, considering the increase in health-related needs of an ageing population and the potential effects of climate change, future research into the full societal costs of not addressing energy poverty among older Australians could provide surprising evidence on the externalities and the burden on the public health infrastructure. It is likely that eliminating energy poverty and its negative health effects would reduce additional public health costs associated with a changing climate.

The present study can be replicated towards other vulnerable groups, to explore their complexities and unique issues and challenges with respect to energy poverty. It is very likely that other energy-vulnerable households, such as single-parent low-income families and First Nations households experience energy poverty in different ways to older low-income households. Judson et al. (2019) investigated the effectiveness of small scale solar panels and energy performance feedback in alleviating energy poverty for cooperative housing tenants. However, it was a very small-scale study, only including eight households. A similar mixed-methods approach aimed at understanding the extent, causes and impacts of energy poverty among different energy vulnerable households might reveal distinct issues and needs that demand tailored policies and solutions. Other potential vulnerable households might include low-income CALD background households that might have limited English literacy, households with disabilities, and large families. Those studies can contribute to expanding the number of "personas" in the energy field for which the market needs to be accessible and inclusive.

A very important group of households susceptible to energy poverty are renters, either in social housing or the private rental market. This study has shown that Age Pensioners who rent their homes are in a much more difficult situation than older homeowners. Besides the housing costs being significantly higher, more especially in the private rental sector, the lack of agency with respect to maintenance and upgrade of the dwelling contributes to their experience of energy poverty. Understanding energy poverty among renters is extremely important, since the number of renters in Australia has increased substantially in the last three decades. In 1994, 23.9% of Australian households rented their homes; in 2017-2018, this number increased to 32% (ABS, 2019c). Australia's overall home ownership rate is projected to decline to around 63% for all households by 2040 (Burke et al., 2020). Further research should examine the precarious circumstance of low-income renters, and specific solutions to the split incentive need to be devised. In June 2021, an addition to the AHCD dataset included information on the housing conditions of more than 15,000 rental households (Baker et al.,

2021). The Australian Rental Housing Conditions Dataset utilises a similar questionnaire to the AHCD. Hence, an exploration of energy poverty and its connections with housing and health, similar to the present study, using this new dataset is likely to provide more evidence and insights into how to tackle this issue.

I suggest further work is needed to investigate energy literacy among energy poor households. Firstly, there needs to be a better understanding of what energy literacy is. While previous studies have focused on knowledge of sustainable energy practices and broad energy related concepts (Hogan et al., 2019), it is necessary to identify what is important for energy-poor households to know in order to alleviate their situation. Knowledge about energy assistance schemes, for example, are not widespread. Bourdieu's theory can provide a useful framework for understanding what necessary cultural capital forms are required by energy-poor households to be able to engage with the energy field.

Lastly, while this doctoral research is focused on older low-income energy-poor households, the broader conceptualisation of energy poverty using Bourdieu's theory opens new avenues for future research, such as understanding the habitus of other groups of energy poor households and how it plays a role in their experience of energy poverty, or researching the habitus of other agents in the energy field (e.g., the energy retailers) and how they contribute to reproducing power imbalance and energy injustice. Additionally, integrating quantitative and qualitative established measures of the other types of capital and the energy capital can help to indicate the strength of the relationship between all the forms of capital.

9.6 Final remarks

Three and half years, hundreds of pages and thousands of words later, I would like to finish this chapter with a self-reflection about this research. If anything, this research journey transformed me. I'm certainly a better professional. I developed critical thinking and stronger analytical skills, I learned about responsible and ethical research procedures, I dove deep into the data to add new knowledge to an emerging literature. Nevertheless, the greatest transformation is personal. It was impossible not to be emotionally touched by those whose words I shared here. Hearing my interviewees' stories, their sufferings and their feelings helped me develop a vital human virtue: empathy.

Energy poverty sickens the body and mind of older Australians. It compromises their wellbeing and their capabilities to live a pleasant and decent life. It takes away their dignity of living – many are reduced to surviving. It distances them from other people, leisure and culture. It breaks their self-esteem. The stigma of energy poverty discourages them from seeking assistance. No survey quantitative findings could provide this kind of evidence. I had to hear the stories. I had to feel their stories. In conclusion, I needed the problem to be humanised. If I was able to make an original contribution to knowledge with this thesis, that is because my interviewees opened my eyes about it.

During this PhD journey, I was particularly drawn to the following quote from Gates (2019, p. 133):

> *When people become better at seeing themselves in the lives of others, feeling others' suffering and easing their pain, then life in that community gets better in many cases. […] Empathy is not the only force needed to ease suffering: we need science as well. But empathy helps end our bias about who deserves the benefits of science.*

As researchers, we need to become better at empathy. As professionals in privileged positions, we need to become better at empathy. Empathy must be a key factor in decision making about research and its benefits. As researchers, we have a moral obligation to give voice to those who have not had any. To tell the stories many choose not to hear, and make sure those stories are not only heard but taken into account when policies are designed. We need empathy and research to go hand in hand if we wish to eliminate energy poverty.

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Housing Questionnaire June 2016

INTRODUCTION

Good ..... My name is ..... I'm calling from ... on behalf of the University of Adelaide. We are conducting a survey on a range of housing and health issues.

Could I please speak with a person living in your home aged 18 years or over, who was the last to have a birthday?

(Single Response)

1. Yes – repeat intro if necessary and continue
2. No – make appointment or Terminate 1
3. Refused - selected respondent refused to continue, go to Terminate 1

The survey is aimed at collecting high quality data on current housing conditions in Australia to provide a foundation for future research and policy development. This research is funded by the Australian Research Council and has approval from The University of Adelaide Human Research Ethics Committee under project number H-2016-145.

Whilst your input to the survey is important to us, participation is voluntary and you can choose not to answer any particular question or any section. You are free to withdraw from the survey at any time.

The questionnaire will take approximately 12 minutes to complete, but may take longer depending on the number of questions that are relevant to you.

I can assure you that all information given will remain confidential. The answers from all people interviewed will be gathered together and reported as a whole. No individual answers will be passed on.

The information collected from this survey will form a resource that will be used by researchers nationwide. Its storage and administration will be overseen by The University of Adelaide and all use will be subject to ethical clearance. Importantly, no one will have access to your personal contact details or be able to identify you through your responses.

If you would like further information about the project before continuing with the interview, we can send you a flyer or give you the contact details of one of the researchers, and reschedule the interview for a later date?

[For landlines]Your phone number has been selected randomly from the Electronic White Pages.
[For mobiles] Your phone number was selected randomly from the Australian Residential Directory.

A.1 This call may be monitored by my supervisor for quality control purposes. Are you happy to continue with this survey?

(Single Response)

1. Yes
2. No – make appointment
3. Refused to do survey- Go to Terminate 1

Teminate1 **On behalf of researchers at the University of Adelaide and (...), thank you for your time.**

A. Dwelling tenure and costs

First of all, we'd like to ask you some questions about your home.

A.1 Is this dwelling...

(Single response. Read options. Interviewer note: include owner of caravans, manufactured homes or houseboats in 'Owned with a mortgage' or 'Owned outright' regardless of whether or not the site is owned, include leaseholds and loan and license agreements in 'Being occupied under a life tenure scheme')

1. **Owned outright**
2. **Owned with a mortgage**
3. **Being rented**
4. Other (specify) (*interviewer note: include being purchased under a shared equity scheme & being occupied under a life tenure scheme)*
5. Don't know
6. Refused

Sequence guide: if A1=1,2 Go to A3
Sequence guide: if A1>3 Go to A4

A.2 Who do you rent this dwelling from?

(Single Response)

1. Real estate agent
2. State or territory housing authority
3. Person not in the same household (*Interviewer note: private rental agreement*)
4. Employer
5. Other (specify) (*Interviewer note: includes caravan park, housing cooperative/community/church group*)
6. Don't know
7. Refused

(Sequence guide: Go to A4)

A.3 Did you…

(Single response. Read options)

1. **Purchase this dwelling from a previous owner**
2. **Commission an architect**
3. **Commission a building designer or draftsperson**
4. **Purchase it 'off the plan'** (Land had been purchased prior to building.)
5. **Purchase a house and land package** (ie buying both the land and house at the same time)
6. **Knock down an existing dwelling and rebuild**
7. **Self-build**
8. Other (specify)
9. Don't know
10. Refused

A.4 How many years have you lived here?

(Single response)

1. Enter years
2. Less than one year
3. Don't know
4. Refused

Sequence guide: if A4>5 years Go to A6

A.5 How many time have you moved in the past 5 years?

(Single response)

1. Enter number
2. Don't know
3. Refused

A.6 What is the best description of your dwelling?

(Single response. Read options)

1. **Separate house**
2. **Semi-detached, row or terrace house, townhouse etc**
3. **Flat or apartment**
4. Other (specify) (*Interviewer note: includes caravan, cabin, houseboat, improvised home, tent, sleepers out, house or flat attached to a shop, office etc)*
5. Don't know
6. Refused

A.7 How many stories is the building that you live in?

(Single response)

1. Enter number
2. Don't know
3. Refused

Sequence guide: if A6~=3 Go to A9

Sequence guide: if A7=1 (1 story) Go to A9

A.8 What level is your flat or apartment on?

(Single response. Read options if necessary)

1. Enter number_____
2. Refused

A.9 How old is your home?

(Single response)

1. *Enter years*_____
2. *Enter months*_____
   OR
3. *Enter year it was built* ____
4. Don't know
5. Refused

A.10 How many bedrooms are there in this dwelling? (CATI note: program to substitute the word 'dwelling' for response at A6)

(Single response)

1. Enter number
2. Don't know
3. Refused

A.11 How many off-street car parking places, including garages or carports, are associated with your dwelling? (CATI note: program to substitute the word 'dwelling' for response at A6)

(Single response. *Interviewer note: only includes car parks designated for their own dwelling.*)

1. Enter number
2. Don't know
3. Refused

A.12 Does your dwelling provide you with adequate access to outside space for leisure activities such as gardening, having a pet, or room for outside entertaining? (CATI note: program to substitute the word 'dwelling' for response at A6)

(Single response)

1. Yes
2. No
3. Not applicable
4. Don't know
5. Refused

A.13 What is the main material of the roof of your dwelling? (CATI note: program to substitute the word 'dwelling' for response at A6)

(Single response)

1. Tiles
2. Metal sheeting
3. Concrete
4. Other (specify)
5. Don't know
6. Refused

A.14 What is the main material of the outside walls of your dwelling? (CATI note: program to substitute the word 'dwelling' for response at A6)

(Single response)

1. Masonry (include brick, double brick, brick veneer, stone, concrete)
2. Timber
3. Fibro cement sheet
4. Steel or aluminium
5. Other (specify)
6. Don't know
7. Refused

A.15 Does this dwelling have any MAJOR building problems? (CATI note: program to substitute the word 'dwelling' for response at A6)

(Multiple Response. *Interviewer note: if yes prompt for what problems.)*

1. Rising damp
2. Mould
3. Cracks in walls/floors
4. Sinking/moving foundations
5. Sagging floors
6. Walls/windows out of plumb (Interviewer note: 'not plumb' means out of alignment)
7. Wood rot/termite damage
8. Electrical problems
9. Roof defect
10. Other (specify)
11. No problems
12. Don't know
13. Refused

A.16 How do you rate the need for repairs to your dwelling? (CATI note: program to substitute the word 'dwelling' for response at A6)

(Single Response. Read options)

1. **No need**
2. **Desirable, but low need**
3. **Moderate need**
4. **Essential need**
5. **Essential and urgent need**
6. Don't know
7. Refused

A.17 In the last 12 months have any of these types of repairs or maintenance been carried out on your dwelling? (CATI note: program to substitute the word 'dwelling' for response at A6)

(Multiple Response. Read options)

1. **Painting**
2. **Roof repair/maintenance**
3. **Tile repair/maintenance**
4. **Electrical work**
5. **Plumbing**
6. Other (specify)
7. No repairs carried out
8. Don't know
9. Refused

Sequence guide: if A17>6 Go to A19

A.18 What was the approximate value of these repairs or maintenance?

(Single response)

1. Enter number
2. Don't know
3. Refused

Sequence guide: if A1>2 Go to A20

A.19 Since you bought this dwelling have you or has anyone in this household made any of these modifications to this dwelling? (CATI note: program to substitute the word 'dwelling' for response at A6)

(Read options. Multiple response)

1. **Replaced electric hot water system with gas hot water system**
2. **Installed solar hot water system**
3. **Installed solar electricity**
4. **Installed insulation**
5. **Installed ceiling fans**
6. **Installed double glazed windows**
7. **Installed outside awnings/shutters that improved energy efficiency**
8. **Modified the dwelling for age or disability** (e.g. ramps, rails, wider doors etc)
9. **Major kitchen renovation**
10. **Major bathroom renovation**
11. **Added rooms or extensions**
12. Other (specify)
13. None
14. Don't know
15. Refused

A.20 During the cold winter weather, can you normally keep comfortably warm in your house? (CATI note: program to substitute the word 'house' for response at A6)

(Single response)

1. Yes
2. No
3. Not applicable
4. Don't know
5. Refused

A.21 During the hot summer weather, can you normally keep comfortable in your house? (CATI note: program to substitute the word 'house' for response at A6)

(Single response)

1. Yes
2. No
3. Not applicable
4. Don't know
5. Refused

A.22 Are you satisfied with the amount of natural light in your dwelling? (CATI note: program to substitute the word 'dwelling' for response at A6)

(Single response)

1. Yes
2. No
3. Don't know
4. Refused

A.23 When you are indoors at home, how often, if ever, are you bothered by noise?

(Read options. *Interviewer note: noise from outside the home.)*

1. **Very often**
2. **Fairly often**
3. **Not very often**
4. **Never**
5. Don't know
6. Refused

A.24 Does this dwelling have an electrical safety switch or circuit breaker installed? (CATI note: program to substitute the word 'dwelling' for response at A6)

(Single response)

1. Yes
2. No
3. Don't know
4. Refused

A.25 Does this dwelling have a functioning smoke detector? (CATI note: program to substitute the word 'dwelling' for response at A6)

(Single response)

1. Yes
2. No
3. Don't know
4. Refused

A.26 What are the main sources of energy or fuel used in this dwelling? (CATI note: program to substitute the word 'dwelling' for response at A6)

(Multiple response. *Interviewer note: If 'Gas' probe for what type.*)

1. **Electricity**
2. **Mains gas**
3. **Bottled gas/LPG** (excluding small bottles used occasionally)
4. **Wood**
5. **Solar** (solar electricity or solar hot water)
6. Other (specify)
7. Don't know
8. Refused

A.27 If you have gas heaters, have they been serviced in the last two years?

(Single response)

1. Yes
2. No
3. Not applicable
4. Don't know
5. Refused

A.28 Are you able to adequately secure this dwelling? (e.g. lockable screen door, etc.)? (CATI note: program to substitute the word 'dwelling' for response at A6)

(Single response)

1. Yes
2. No
3. Don't know
4. Refused

A.29 How safe do you feel at home by yourself during the day?

(Single response. Read options)

1. **Very safe**
2. **Safe**
3. Neither safe nor unsafe
4. **Unsafe**
5. **Very unsafe**
6. Never home alone during the day
7. Don't know
8. Refused

A.30 How safe do you feel at home by yourself after dark?

(Single response. Read options)

1. **Very safe**
2. **Safe**
3. Neither safe nor unsafe
4. **Unsafe**
5. **Very unsafe**
6. Never home alone after dark
7. Don't know
8. Refused

A.31 How would you rate the overall physical quality of your dwelling?

(Single response. Read options. *Interviewer note: this refers to overall dwelling condition/quality and includes aspects such as quality of construction, structural integrity, design quality etc.)*

1. **Excellent**
2. **Good**
3. **Average**
4. **Poor**
5. **Very poor**
6. Don't know
7. Refused

A.32 Have you or anyone in your household sustained any physical injury from any aspect of your housing that is unsafe or not of good quality?

(Single response)

1. Yes
2. No
3. Don't know
4. Refused

A.33 Thinking about the areas that we have just covered, are there any aspects of the dwelling that you are dissatisfied with? (CATI note: program to substitute the word 'dwelling' for response at A6)

(Multiple response)

1. Too big
2. Too small
3. Too cold
4. Too hot
5. Poor condition of dwelling
6. Structurally unsound
7. Needs to be more secure
8. Maintenance too high
9. Other (specify)
10. Not dissatisfied with any aspect
11. Don't know
12. Refused

A.34 Overall, how would you rate your satisfaction or dissatisfaction with this dwelling? (CATI note: program to substitute the word 'dwelling' for response at A6)

(Single response. Read options)

1. **Very satisfied**
2. **Satisfied**
3. Neither satisfied nor dissatisfied
4. **Dissatisfied**
5. **Very dissatisfied**
6. Don't know
7. Refused

A.35 Overall, how would you rate your satisfaction or dissatisfaction with the location of your dwelling in terms of access to work, shops, schools, etc.? (CATI note: program to substitute the word 'dwelling' for response at A6)

(Single response. Read options if necessary)

1. **Very satisfied**
2. **Satisfied**
3. Neither satisfied nor dissatisfied
4. **Dissatisfied**
5. **Very dissatisfied**
6. Don't know
7. Refused

A.36 Does the overall condition and quality of your house enable you to have family and friends around? (CATI note: program to substitute the word 'dwelling' for response at A6)

(Single response. Read options)

1. **Yes, completely**
2. **Yes, with reservations**
3. **No**
4. Don't know
5. Refused

A.37 In the next 5 years do you hope to stay in your current dwelling or move to a different dwelling? (CATI note: program to substitute the word 'dwelling' for response at A6)

(Single response)

1. Stay in current dwelling
2. Move to a different dwelling
3. Don't know
4. Refused

Sequence guide: if A37=1,3,4 Go to A40

A.38 Are you able to give general reasons for wanting to move in the future?

(Multiple response)

1. Housing reasons
2. Employment reasons
3. Accessibility reasons
4. Family reasons
5. Lifestyle reasons
6. Neighbours/neighbourhood reasons
7. Health reasons
8. Other
9. Don't know
10. Refused

A.39 Do you foresee any barriers to moving in the next 5 years? If yes, what kind of barriers?

(Multiple response)

1. None
2. Can't afford the costs associated with moving
3. Too much effort to move
4. For frailty, disability or ill health reasons
5. Other (specify)
6. Don't know
7. Refused

Sequence guide: if A1=1 Go to A42

A.40 How much does your household pay in rent/mortgage repayments for this dwelling? (CATI note: program to substitute the word 'dwelling' for response at A6)

(Single response. *Interviewer note: does not include bills/utilities.*)

1. Enter amount per week
2. Enter amount per fortnight
3. Enter amount per month
4. Don't know
5. Refused

A.41 Is the amount that your household pays for your dwelling affordable? (CATI note: program to substitute the word 'dwelling' for response at A6)

(Single response. Read options)

1. **Yes, completely**
2. **Yes, with reservations**
3. **No**
4. Don't know
5. Refused

A.42 In the last 12 months, has there been any times where members of the household have experienced financial strain?

(Single response)

1. Yes
2. No
3. Don't know
4. Refused

Sequence guide: if A42>1 Go to Next section

A.43 In the last 12 months, have any of these happened to members of this household because the household was short of money?

(Multiple Response. Read options)

1. **Could not pay electricity, gas or telephone bills on time**
2. **Could not pay mortgage or rent payments on time**
3. **Could not pay for car registration or insurance on time**
4. **Could not make minimum payment on credit card**
5. **Pawned or sold something because you needed cash**
6. **Went without meals**
7. **Were unable to heat your home**
8. **Sought financial assistance from friends or family**
9. **Sought assistance from welfare or community organisations**
10. No, none of these
11. Don't know
12. Refused

B. Health status

And now, a few questions about your general health...

B.1 In general, would you say your health is...

(Single response. Read options)

1. **Excellent**
2. **Very good**
3. **Good**
4. **Fair**
5. **Poor**
6. Don't know
7. Refused

B.2 **Have you ever been told by a doctor that you have any of the following conditions?**

(Multiple response. Read options)

1. **Asthma**
2. **Chronic bronchitis, or other respiratory illnesses**
3. **Coronary heart disease or angina**
4. **High blood pressure (hypertension)**
5. **Allergy, such as rhinitis, hay fever, eye inflammation, dermatitis, food allergy or other allergy (not asthma)**
6. None of the above
7. Don't know
8. Refused

B.3 **In the last 12 months have you been told by a doctor that you have any of the following conditions?**

(Multiple response. Read options)

1. **Anxiety**
2. **Depression**
3. **A stress related problem**
4. **Any other mental health problem**
5. None of the above
6. Don't know
7. Refused

B.4 **Do you have any other long-term health condition, impairment or disability that restricts you in your everyday activities, and has lasted or is likely to last, for 6 months or more?**

(Single response)

1. Yes
2. No
3. Don't know
4. Refused

B.5 **Does anyone else in your household have any long-term health condition, impairment or disability that restricts them in their everyday activities, and has lasted or is likely to last, for 6 months or more?**

(Single response)

1. Yes
2. No
3. Not applicable
4. Don't know
5. Refused

Z. Demographics

Now to finish with some general questions.

Z.1 **How old you are?**

(Single Response. *Interviewer note enter 998 Don't know, 999 refused*)

1. Enter age
2. Don't know
3. Refused

Sequence Guide: If Z1 <998 Go to Z3

Z.2 **Which age group are you in? Would it be...**

(Read options. Single response)

1. **18 to 24 years**
2. **25 to 34 years**
3. **35 to 44 years**
4. **45 to 54 years**
5. **55 to 64 years**
6. **65 to 74 years**
7. **75 years or over**
8. Refused (End interview)

Z.3 **Sex (ask if unsure)**

1. Male
2. Female
3. Other
4. Refused

Z.4 **Can you tell me the approximate annual gross income of your household? That is, for all people in the household before tax is taken out. I'll read out some categories and could you please tell me into which one your household's income falls?**

(Read Options. Single Response)

1. **Up to $12,000**
2. **$12,001 - $20,000**
3. **$20,001 - $40,000**
4. **$40,001 - $60,000**
5. **$60,001 - $80,000**
6. **$80,001 - $100,000**
7. **$100,001 - $150,000**
8. **$150,001 - $200,000**
9. **More than $200,000**
10. Not stated/refused
11. Don't know

Z.5 What is this household's main source of income?

(Single Response)

1. Wages or salary (including from own incorporated business)
2. Own unincorporated business or share in a partnership
3. Government pension or allowance
4. Superannuation, an annuity or private pension
5. Other
6. Don't know
7. Refused

Z.6 What is the family structure of your household?

(Single Response. Read out)

1. Couple with no children
2. Couple with children
3. One parent family with children
4. Lone person
5. Other family structure
6. Shared living arrangement with friends
7. Refused

Sequence Guide: If Z7 =1 or 4 Go to Z9

Z.7 How many children under the age of 18 old usually reside in this dwelling?

(Single Response. *Interviewer note: includes children in shared care arrangements. 998 don't know. 999 refused*)

1. Enter number

Z.8 Including yourself how many people aged 18 or over live in this household?

(Single Response. *Interviewer note enter 998 don't know. 999 refused*)

2. *Enter number*

Z.9 What is the Postcode of the house?

(Single Response. *Interviewer note enter 998 don't know. 999 refused*)

1. *Enter number*

Z.10 What town or suburb do you live in?

(Single Response. *Interviewer note enter 998 don't know. 999 refused*)

1. *Enter town/suburb*

Z.11 How many residential telephone numbers, <u>including</u> mobile phones, can be used to speak to someone in this household?

(Single Response. *Interviewer note: do not include Internet or fax numbers*)

1. *Enter number* ___
2. Don't know [99]

Z.12 How many times [do these / does this] number(s) appear in the White Pages?

(Single Response. *Interviewer note: do not include Internet or fax numbers. Total number of entries includes numbers that are listed more than once.*)

1. *Enter number* ___
2. Don't know [99]

Z.13 Do you give consent to be contacted about research related to this survey in the future? This research would be aimed at gathering more detailed information about your housing conditions. Your contact details will be kept in a secure location and will only be accessed by the research team. You will always have the opportunity to decline further participation at any stage.

(Single response)

1. Yes
2. No
3. Don't know
4. Refused

Sequence Guide: If Z14 >1 END

Z.14 So that you can be contacted in future, what is your first or given name?

(Single response)

1. Enter name
2. Refused

Z.15 Can I confirm your contact details?

(Single response)

1. Address
2. Other address (specify)
3. Refused

Z.16 Can I confirm your contact details?

(Single response)

1. Contact number
2. Other contact number (specify)
3. Refused

Z.17 Can I confirm your contact details?

(Single response)

1. Email (specify)
2. Refused

That concludes the survey. If any of these questions have caused you concern or if you would like any further information about the study please contact either the research team on 08 8313 4592 or The University of Adelaide's Human Research Ethics Committee Secretary on 08 8313 6028. Alternatively, we can send out the project flyer with these details. On behalf of the researchers at the University of Adelaide, thank you very much for taking part in this survey.

Appendix 2 - Recoding and computing of variables

Recoding variables

1. Original variable (OV): a4 – Years lived in current dwelling
    a. Derived variable (DV): DV_a4 – Recode to group values in 6 categories:

OV Value	DV Value	DV Label
997	0	Less than 1 year
1 to 10	1	Between 1 and 10 years
11 to 20	2	Between 11 and 20 years
21 to 30	3	Between 21 and 30 years
31 to 50	4	Between 31 and 50 years
51 to 86 (highest)	5	More than 51 years
998	SYSMISS	Missing
999	SYSMISS	Missing

2. OV: a9overall – Dwelling age: overall
    a. DV: DV_a9overall – Recode to group values in 6 categories:

OV Value	DV Value	DV Label
0 to 13	1	Less than 13 years old
14 to 20	2	Between 14 and 20 years old
21 to 30	3	Between 21 and 30 years old
31 to 50	4	Between 31 and 50 years old
51 to 100	5	Between 51 and 100 years old
101 to 166 (highest)	6	More than 101 years old
998	SYSMISS	Missing
999	SYSMISS	Missing

    b. DV: DV_a9overall_SYSMISS – Recode to treat 998 and 999 as Missing Values, but no grouping categories:

OV Value	DV Value	DV Label
998	SYSMISS	Missing
999	SYSMISS	Missing
0 to 166	0 to 166 (same value)	None

3. OV: a20 – Ability to keep warm in winter
    a. DV: DV_a20_EP – Recode to True or False value to following NEGATIVE rephrase: "During the cold winter weather, you cannot keep comfortably warm in your house".

OV Value	DV Value	DV Label
1 – Yes	0	False
2 – No	1	True
3 – Not applicable	SYSMISS	Missing
4 – Don't know	SYSMISS	Missing
5 – Refused	SYSMISS	Missing

b. DV: DV_a20_EPindex – Recode DV_a20_EP to include missing values as Zero.

OV Value	DV Value	DV Label
0	0	False
1	1	True
SYSMISS	0	False

4. OV: a21 – Ability to keep cool in summer
    a. DV: DV_a21_EP – Recode to True or False values to following NEGATIVE rephrase: "During the hot summer weather, you cannot keep comfortably cool in your house".

OV Value	DV Value	DV Label
1 – Yes	0	False
2 – No	1	True
3 – Not applicable	SYSMISS	Missing
4 – Don't know	SYSMISS	Missing
5 – Refused	SYSMISS	Missing

b. DV: DV_a21_EPindex – Recode DV_a21_EP to include missing values as Zero.

OV Value	DV Value	DV Label
0	0	False
1	1	True
SYSMISS	0	False

5. OV: a431 – Financial strain in last 12 months: could not pay electricity, gas or telephone bills on time
    a. DV: DV_a431_EP – Recode to consider True or False values to following rephrase: “In the last 12 months, you could not pay electricity, gas or telephone bills on time”.

OV Value	DV Value	DV Label
0 – No	0	False
1 – Yes	1	True
-99 – Missing	SYSMISS	Missing

    b. DV: DV_a431_EPindex – Recode DV_a431_EP to include missing values as Zero.

OV Value	DV Value	DV Label
0	0	False
1	1	True
SYSMISS	0	False

6. OV: a437 - Financial strain in last 12 months: were unable to heat your home
    a. DV: DV_a437_EP – Recode to consider True or False values to following rephrase: “In the last 12 months, you were unable to heat your home”.

OV Value	DV Value	DV Label
0 – No	0	False
1 – Yes	1	True
-99 – Missing	SYSMISS	Missing

    b. DV: DV_a437_EPindex – Recode DV_a437_EP to include missing values as Zero.

OV Value	DV Value	DV Label
0	0	False
1	1	True
SYSMISS	0	False

7. OV: agegrp – Age Group

a. DV: DV_agegroup – Recode 8 existing categories into 2 categories.

OV Value	DV Value	DV Label
1 – 18 to 24 years	0	Not an older Australian (<65)
2 – 25 to 34 years	0	Not an older Australian (<65)
3 – 35 to 44 years	0	Not an older Australian (<65)
4 – 45 to 54 years	0	Not an older Australian (<65)
5 – 55 to 64 years	0	Not an older Australian (<65)
6 – 65 to 74 years	1	Older Australian (65+)
7 – 75 years or over	1	Older Australian (65+)
8 – Refused (end interview)	SYSMISS	Missing

Computing a new variable

1. DV: EP_Index - Energy Poverty Index – Sum of DV_a431_EPindex + DV_a437_EPindex + DV_a20_EPindex + DV_a21_EPindex.

DV Value	DV Label
0	Not in energy poverty
1	In energy poverty by 1 indicator
2	In energy poverty by 2 indicators
3	In energy poverty by 3 indicators
4	In energy poverty by 4 indicators

Appendix 3 - Variables analysed in the AHCD

Bivariate Analysis - PART 1

	Housing tenure	Age bracket
Age bracket	x	
Gender	x	
Income level	x	
Main source of income	x	x
Household composition	x	

	Housing tenure	Age bracket	Gender	Main source of income	Income level	Household composition	Mental health condition
Self-assessed health data	x	x	x	x	x	x	
Physical health condition (MR)	x	x	x	x	x	x	x
Mental health condition (MR)	x	x	x	x	x	x	
Long-term restricting condition	x	x	x	x	x	x	

x	Analysis conducted in SPSS
x	Analysis conducted and reported in Word file

Bivariate Analysis - PART 2

	Housing tenure	Age bracket	Gender	Main source of income	Income level	Household composition
Landlord type		x	x	x	x	
How dwelling was purchased		x	x	x		
Years lived in current dwelling	x	x	x	x		
Dwelling type	x	x	x	x		x
Dwelling age	x	x	x	x		x
Dwelling size	x	x	x	x		x
Presence/adequacy of outdoor space	x	x	x	x		
Main materials of roof	x	x	x	x		
Main materials of walls	x	x	x	x		
Major building problems (MR)	x	x	x	x		
Need for repairs	x	x	x	x		
Types of repairs	x	x	x	x		
Modifications in last 12 months		x	x	x		
Electrical safety switch	x	x	x	x		
Main source of energy	x	x	x	x		
Smoke detector	x	x	x	x		
Gas heater maintenance	x	x	x	x		
Natural lighting		x	x	x		
Self-assessed quality of dwelling	x	x	x	x	x	
Physical injury from dwelling	x	x	x	x		
Disssatisfaction aspects of dwelling	x	x	x	x		
Satisfaction with the dwelling	x	x	x	x	x	
Housing conditions to enable social interaction	x	x	x	x	x	
Affordability of household costs	x	x	x	x		
Financial strain screening question	x	x	x	x		
Types of financial strain	x	x	x	x		

x	Analysis conducted in SPSS
x	Analysis conducted and reported in Word file

Bivariate Analysis - PART 3

	Inability to keep comfortably warm at home	Inability to keeop comfortably cool at home	Inability to pay utilities' bills (inc. electricity and gas) on time	Inability to heat home	Energy poverty index (Combined)
Age bracket	x	x	x	x	x
Gender	x	x	x	x	x
Income level	x	x	x	x	x
Main source of income	x	x	x	x	x
Household composition	x	x	x	x	x
Housing tenure	x	x	x	x	x
Landlord type	x	x	x	x	x
Dwelling type	x	x	x	x	x
Dwelling age	x	x	x	x	x
Dwelling size	x	x	x	x	x
Presence/adequacy of outdoor space	x	x	x	x	x
Main materials of roof	x	x	x	x	x
Main materials of walls	x	x	x	x	x
Major building problems	x	x	x	x	x
Adequacy of natural light	x	x	x	x	x
Main source of energy	x	x	x	x	x
Need for repairs	x	x	x	x	x
Self-assessed quality of dwelling	x	x	x	x	x
Satisfaction with the dwelling	x	x	x	x	x
Dissatisfaction with the home: too hot		x	x	x	x
Dissatisfaction with the home: too cold	x		x	x	x
Housing conditions to enable social interaction	x	x	x	x	x
Affordability of household costs	x	x	x	x	x
Self-assessed health condition	x	x	x	x	x
Mental health condition (MR)			x		x
Physical health condition (MR)					x
Long-term restricting condition	x	x	x	x	x

x	Analysis conducted in SPSS
x	Analysis conducted and reported in Word file

Bivariate Analysis - PART 4

	Self-assessed health	Mental health condition (MR)	Physical health condition (MR)	Long-term restricting activity
Self-assessed quality of the dwelling	x	x	x	x
Satisfaction with the dwelling	x	x	x	x
Need for repairs	x	x	x	x
Physical injury from dwelling			x	x
Housing conditions to enable social interaction		x		
Affordability of household costs		x		

x	Analysis conducted in SPSS
x	Analysis conducted and reported in Word file

Appendix 4 - Interview guide

ENERGY POVERTY, CLIMATE CHANGE AND OLDER AUSTRALIANS: ADAPTING RESIDENTIAL PROPERTY IN SYDNEY

PhD Candidate Caroline Porto Valente
Supervised by Professor Sara Wilkinson and Professor Alan Morris

UTS UNIVERSITY OF TECHNOLOGY SYDNEY

INTERVIEW GUIDE

Before the interview:

- ☐ Thank the interviewer for agreeing to participate
- ☐ Give the interviewer my contact details (business card)
- ☐ Restate the purpose of the research:
  - ☐ Learn how the increasing energy costs are affecting people's everyday life, health and wellbeing
  - ☐ Recommendations to policymakers on energy efficient interventions based on the study
- ☐ Go through the PIS and Consent Form
- ☐ Explain how the interview will work:
  - ☐ 6 main topics to address and good to have as much details as possible
  - ☐ They can interrupt at any point and respond to questions in any way they feel is relevant
  - ☐ There is no right or wrong answer
  - ☐ They don't need to answer questions they feel uncomfortable about
- ☐ Ask whether it is ok to audio record the interview and explain they can stop the recording at any time
- ☐ Collect signed Consent Form and stress confidentiality and deidentification.

Topics:

1. Background and housing characteristics;
2. Use of energy at home and strategies to reduce energy consumption;
3. The impacts of the home on energy usage;
4. Paying the energy bill and profiling of energy poverty;
5. Impacts of the cost of energy;
6. Awareness of assistance programs, rebates, EAPA vouchers and home energy efficiency programs.

Topic 1: Background and Housing Characteristics (Housing Questionnaire in hand)

1.1. Background: 1. Do you live close to this community centre/library? Whereabouts? 2. How long have you lived in your current home? Do you own or rent it? Social housing or private market? 3. Do you live in your home by yourself or do you have someone living there with you? How many people? Ask about the relationship with them – partner, children, etc. **1.2. Housing characteristics:** 1. Now can you tell me a bit about your house? How old is it? Is it a stand-alone house or semi-detached? How's the exterior - Is it a brick-veneer, double brick, or timber cladding home? 2. How many bedrooms? Any spare bedrooms? 3. How do find your house: 4. Is it cool in summer? Are you able to cool it so the temperature is pleasant? 5. Is it warm in winter? Are you able to heat it so the temperature is pleasant? 6. Do you know if it is insulated? Where? Roof? Walls? Both? 7. Any windows treatments? Double-glazing, for example? 8. What are the energy sources in your home? Just electricity? Or do you have gas, as well? Bottled or mains? 9. Have you done any improvements in your home recently? If yes, what was it? If energy-related – why did you do it?	**Notes:**

ENERGY POVERTY, CLIMATE CHANGE AND OLDER AUSTRALIANS: ADAPTING RESIDENTIAL PROPERTY IN SYDNEY

PhD Candidate Caroline Porto Valente
Supervised by Professor Sara Wilkinson and Professor Alan Morris

UTS UNIVERSITY OF TECHNOLOGY SYDNEY

Topic 2: Use of Energy at Home and Strategies to Reduce Energy Consumption

	Notes:
1. How do you use your energy? What are your main uses of electricity (and gas, if that's the case)? Heating the home? Cooling the home? Hot water? Food related (fridge and cooking)? Laundry? Hot water? Etc. Do you restrict usage? Can you give details? 2. Do you have an air-conditioner? Is it a central system to the home or just single rooms? How often do you use it? 3. How do you heat your home? Is it a central system to the home or just single rooms? How often do you use it? 4. What about your domestic appliances? Fridge, TV, Computer? How old are they? 5. How do you save on energy usage? 6. Do you track or monitor your energy use? How? And why do you monitor it? Or why not? 7. What do you think consumes the most energy in your home? 8. Do you spend a lot of time at home during the week? And at weekends? Do you cook a lot? 9. Can you tell me about any particular activities in your day-to-day (or health condition) that make it easier or more difficult to change the amount of energy you use? Such as? 10. How have the recent events (bushfires, hot summers, COVID and lockdown) affected your energy consumption at home? Are you spending more time at home than usual?	

Topic 3: The Impacts of the Home on Energy Usage

	Notes:
1. How comfortable do you feel at home? If not, how would you describe a comfortable home for you? 2. Are there any aspects of the housing design that have an impact on your energy usage? Ability to heat your home adequately? Cool your home adequately? 3. Have you changed the use of spaces in the house to reduce energy consumption? What did you do? Did it work? 4. Do you have any problems in your house such as drafts, mould, damp walls? Or other problems? 5. Any particular issues in summer/winter? What are they? 6. What things would you like to be able to do to reduce your energy expenditure?	

Topic 4: Paying the Energy Bill and Profiling

4.1. Paying the Energy Bill	Notes:
1. Is paying the energy bills difficult? Do all your bills come around the same time? 2. How do you budget for energy bills? Do you have to do it very carefully to meet the costs? 3. Does the cost of energy affect your quality of life? Do you have to cut out essential items because of high energy bills? If so, what? 4. Are you always able to pay it on time? 5. Do you ever have to ask family or friends for assistance? 6. Do you ever have to approach a charity for assistance (St Vincent's, Salvation Army, etc)? Did you need to wait the bill go overdue to get the assistance?	

7. Do you understand all the charges in the bill? 8. Any current debts with energy providers? If yes, are you on a payment plan that suits your ability to pay? **4.2. Profiling** 1. Have you changed from energy providers in the last 2 years? If so, for any particular reason? 2. If you have lived in the same house for a long period, how does it differ from then and now? Energy prices? Extreme temperatures?	

Topic 5: The Impacts of the Cost of Energy

1. Would you say that cost of energy has an impact on your everyday life? How? At any particular times of the year? 2. Does it have an impact on your health? General wellbeing? In what ways? 3. Does it have an impact on your ability to remain healthy, for example to eat heathy meals? 4. Does it have an impact in your ability to heat or cool the home properly? And does it affect your health and wellbeing? 5. Are you able to purchase what you require or does the cost of energy prevent you from buying certain items? If so, what? 6. Does it affect your capacity to repair or improve your home? In what ways? 7. Does it affect your capacity to socialize and have some leisure activities? 8. Does the cost of energy evoke anxiety / stress? Do you feel a lot of anxiety prior to the bill arriving? 9. How do you see the future in regards to increasing temperatures and high energy costs?	**Notes:**

Topic 6: Awareness of assistance, rebates, EAPA vouchers and home energy efficiency programs

1. Do you get information on energy-related subjects, for example, how to reduce energy expenditure? Where do you get it from? 2. Have you ever received or sought assistance from electricity or gas company to pay bills? 3. Are you aware of EAPA vouchers? Have you ever used any assistance payment schemes? Hardship programs? How was it? 4. What do you think the role of the state government and local council should be in alleviating this struggle with the energy bills? 5. Do you have your energy bills records? Could you share them with me? I will deidentify your info.	**Notes:**

Check if the housing form has most of the responses. If not, ask those final housing details related questions.

After the interview:

- ☐ Give the handout and explain it
- ☐ Ask if there is anything they would like to add to the interview
- ☐ Ask if it is ok to contact them if there is anything I would like to explore further
- ☐ Encourage them to contact me if anything else comes up
- ☐ Inform them that if they would like to see the transcript of the interview and make changes, they can
- ☐ Thank for the interview and time

Appendix 5 - Evidence of ethics approval

HREC Approval Granted - ETH19-4018

Research.Ethics@uts.edu.au <Research.Ethics@uts.edu.au>
Thu 14/11/2019 8:50 AM

To: Alan Morris <Alan.Morris@uts.edu.au>; Sara Wilkinson <SaraWilkinson@uts.edu.au>; Caroline Porto Valente <Caroline.PortoValente@student.uts.edu.au>; Research Ethics <research.ethics@uts.edu.au>

Dear Applicant

Thank you for your response to the Committee's comments for your project titled, "Energy poverty, climate change and older Australians: Adapting residential property in Sydney". The Committee agreed that this application now meets the requirements of the National Statement on Ethical Conduct in Human Research (2007) and has been approved on that basis. You are therefore authorised to commence activities as outlined in your application.

You are reminded that this letter constitutes ethics approval only. This research project must also be undertaken in accordance with all UTS policies and guidelines including the Research Management Policy (http://www.gsu.uts.edu.au/policies/research-management-policy.html).

Your approval number is UTS HREC REF NO. ETH19-4018.

Approval will be for a period of five (5) years from the date of this correspondence subject to the submission of annual progress reports.

The following standard conditions apply to your approval:

• Your approval number must be included in all participant material and advertisements. Any advertisements on Staff Connect without an approval number will be removed.

• The Principal Investigator will immediately report anything that might warrant review of ethical approval of the project to the Ethics Secretariat (Research.Ethics@uts.edu.au).

• The Principal Investigator will notify the UTS HREC of any event that requires a modification to the protocol or other project documents, and submit any required amendments prior to implementation. Instructions can be found at https://staff.uts.edu.au/topichub/Pages/Researching/Research%20Ethics%20and%20Integrity/Human%20research%20ethics/Post-approval/post-approval.aspx#tab2.

• The Principal Investigator will promptly report adverse events to the Ethics Secretariat (Research.Ethics@uts.edu.au). An adverse event is any event (anticipated or otherwise) that has a negative impact on participants, researchers or the reputation of the University. Adverse events can also include privacy breaches, loss of data and damage to property.

• The Principal Investigator will report to the UTS HREC annually and notify the HREC when the project is completed at all sites. The Principal Investigator will notify the UTS HREC of any plan to extend the duration of the project past the approval period listed above through the progress report.

• The Principal Investigator will obtain any additional approvals or authorisations as required (e.g. from other ethics committees, collaborating institutions, supporting organisations).

• The Principal Investigator will notify the UTS HREC of his or her inability to continue as Principal Investigator including the name of and contact information for a replacement.

I also refer you to the AVCC guidelines relating to the storage of data, which require that data be kept for a minimum of 5 years after publication of research. However, in NSW, longer retention requirements are required for research on human subjects with potential long-term effects, research with long-term environmental effects, or research considered of national or

international significance, importance, or controversy. If the data from this research project falls into one of these categories, contact University Records for advice on long-term retention.

You should consider this your official letter of approval. If you require a hardcopy please contact Research.Ethics@uts.edu.au.

If you have any queries about your ethics approval, or require any amendments to your research in the future, please do not hesitate to contact Research.Ethics@uts.edu.au.

Yours sincerely,

A/Prof Beata Bajorek
Chairperson
UTS Human Research Ethics Committee
C/- Research Office
University of Technology Sydney
E: Research.Ethics@uts.edu.au

REF: E38

Appendix 6 - Examples of online advertising material for interviewees' recruitment

COTA NSW March 2020 Newsletter

Are energy costs affecting you?

Anyone who struggles to pay their power bills, and even just people who avoid using the heater or the air conditioner when they really need to, may be living in what researchers call "energy poverty".

Previous studies have indicated that around 28% of Australian households suffer from energy poverty to some extent, and it's estimated that around 30% of these households contain someone over 65. Older people are also more likely to spend more time at home and are therefore more affected by the conditions there.

This situation is exacerbated by poor energy efficiency, especially when the home is of older construction. The negative impact of poor-quality housing is worse for low-income households, as well as the burden of repairs and maintenance. And poor environmental conditions in the home can increase health problems as well.

Caroline Porto Valente, a PhD student at the University Technology Sydney, is investigating the subject. She says that access to power is very important in an ageing population, especially when we have the kind of extreme weather events there have been recently.

'Older people in rented accommodation and those reliant on the age pension are the most likely to be living in energy poverty, but they may not realise it as they are very frugal with their energy consumption,' Caroline says. 'And many of them are not aware of EAPA (Energy Accounts Payment Assistance) vouchers, which you can get to help with your power bills, or don't want to use them because they see it as charity.'

Caroline is looking for people who are struggling with energy costs or restricting energy use to save on bills, and are willing to be interviewed. She will use the information she gathers to make recommendations on how to mitigate energy poverty and increase domestic energy efficiency.

Contact Caroline on [redacted] or caroline.portovalente@student.uts.edu.au

CPSA News

NSW Regional Seniors Transport Card budget blowout!

IT IS one month after the NSW Regional Seniors Travel Card was rolled out and the program has more than doubled its budget.

The $250 card was budgeted to cost $21.8 million for the first year but the NSW Government has admitted that, during the first month of the program, it has spent $45 million.

The program was recently expanded to include veterans of pension age living in regional NSW. This will cause the budget to blow out even further.

The Card has been promised for two calendar years. This means that the Card will end in February 2022.

With large budget blowouts in mind, all eligible pensioners should enjoy this Card while it lasts. Depending on the hole this puts in the NSW Government's pocket the program might not be extended beyond the promised two years.

Get in now and ensure you spend all you're entitled to. You can order your card by visiting a Service NSW shop or calling 13 77 88.

Poverty grows and more Australians suffer

3.4 MILLION Australians are poor and 774,000 of them are children, says new research by the Australian Council of Social Services (ACOSS). ACOSS says that the Age Pension is below the poverty line by $10 per week.

Newstart (now called Jobseeker Payment) is $117 per week below the poverty line.

The poverty that recipients of social security payments experience effects all facets of living in Australia.

One of these is energy consumption.

The Energy Security Board says that low-income households spend 8 to10 per cent of their income on energy bills while average households spend 2 to 4 per cent.

Living in older housing, using older, less energy-efficient appliances and not being able to afford solar panels are some of the reasons why people on lower incomes are spending more on electricity. More in dollars and more percentage-wise.

And there isn't much low-income households can do about it.

Caroline Valente is a PhD student at the University of Technology and is researching how increasing energy costs are effecting the wellbeing of people. Caroline is looking to interview Age Pensioners who struggle to pay their energy bill.

If this sounds like you, call Caroline on [redacted] or email her at caroline.portovalente@student.uts.edu.au. Caroline can also give you some practical tips on how to save on your energy bill.

Why workers should be checking if their super has been paid

THE passing of the Treasury Laws Amendment (Recovering Unpaid Superannuation) Bill 2019 means $200 million out of $6 billion in unpaid employer superannuation contributions will be reunited with their rightful owners, Australian workers.

Each year Australian workers are swindled out of an average $2,000 per worker in superannuation contributions.

How do employers get away with it?

An outdated law only requires super to be paid quarterly, not each pay day, meaning it's difficult for workers to check.

A law that super is paid on pay day would make it much harder for employers to steal from their workers.

But instead of making this important reform, politicians blinked.

Workers should check their pay slips and super account balances.

If anything is awry, they should complain to their employer in the first instance.

If that doesn't work, they need to contact the Australian Tax Office to reclaim unpaid super on their behalf.

CPSA News

Are you living in energy poverty?

IF you spend more than 10 per cent of your income on energy bills, you may live in energy poverty.

Living in energy poverty often means being deprived of enjoying other goods and services because so much of your income is spent on energy.

Pensioners are particularly vulnerable to energy poverty considering the pension is so low.

Caroline Valente, a PhD student from the University of Technology Sydney, is conducting research on how Age Pensioners cope with energy costs.

Valente recently presented her preliminary findings, and they are confronting.

It was found that some Age Pensioners adopt extreme habits to save on energy including showering and cooking less, using candles for lighting and handwashing clothes. To make matters worse these extreme habits will not significantly reduce an energy bill.

This leads to an important insight of Valente's research: 'energy literacy' enables people to effectively reduce energy costs.

Being energy literate means being aware of which appliances use the most energy in a home, what energy rebates and concessions are available and how to choose the best energy deal.

Also, living in an older home with a lower energy efficiency rating will most likely have higher energy costs. For example, in Sydney a two-star energy efficiency rated home was found to have electricity costs of $21.89 per square metre while the costs in a ten-star rated Sydney home were 46 cents per square metre.

The same goes for appliances, the older they are the less efficient they are. Although replacing a 30-year-old fridge will have upfront costs, it will reduce energy costs in the long run.

Customers are not rewarded for remaining loyal to energy providers but may be charged up to 30 per cent more than necessary. It is worth calling your energy provider to see if they have cheaper deals. If not, it may be time to take your business elsewhere.

If you are solely dependent for your income on the Age Pension, and energy costs consume a lot of your income, Caroline Valente would like to interview you.

To participate in the study, contact Caroline Valente on [redacted] or by email: caroline.portovalente@student.uts.edu.au . For people willing to participate, Ms Valente has offered to provide some advice on how to improve your energy literacy and save on bills.

Would you rather be financially secure now or when you are dead?

Many retired people try to avoid doing what they must do if they are to be financially secure.

For many it is an unassailable truth that capital must not be touched.

Capital is there to generate income.

The CPSA booklet *Would you rather be financially secure now or when you are dead?* makes the point that few of us are rich enough not to touch our capital.

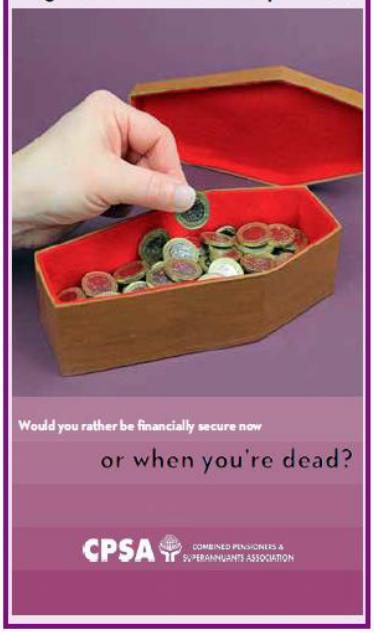
But there are different ways of using up your capital.

You definitely don't want to use up all your capital before you die.

CPSA's booklet tells you how you can go about achieving financial security while you're still alive.

After all, there's no point in being financially secure when you're dead.

The new booklet is available online at cpsa.org.au/publications, or ring 1800 451 488 for a print out.



Appendix 7 - Participant information sheet and consent form (for interviews)

UTS UNIVERSITY OF TECHNOLOGY SYDNEY

PARTICIPANT INFORMATION SHEET
ENERGY POVERTY, CLIMATE CHANGE AND OLDER AUSTRALIANS: ADAPTING RESIDENTIAL PROPERTY IN SYDNEY (UTS HREC ETH19-4018)

WHO IS DOING THE RESEARCH?

My name is Caroline Valente and I am a PhD student at UTS.
My supervisors are Professor Sara Wilkinson (*sara.wilkinson@uts.edu.au*) and Professor Alan Morris (*alan.morris@uts.edu.au*).

WHAT IS THIS RESEARCH ABOUT?

Are you struggling to pay your energy (electricity and gas) bills? Do your energy costs consume a lot of your income? Do you find it's too expensive to run your heater or air conditioner to feel comfortable at home? If so, you may be experiencing what we call 'energy poverty'. This research is to find out about how energy poverty affects your everyday life, your health and wellbeing and; which housing circumstances you live in that might be contributing to this situation. The purpose of the research is to understand the impacts of energy poverty and to make recommendations to policymakers on housing adaptation possibilities based on the study.

WHY HAVE I BEEN ASKED?

You have been invited to participate in this study because you are primarily, or solely, dependent on the Age Pension for your income, and; you may be struggling to pay your energy bills and/or using energy very sparingly.

IF I SAY YES, WHAT WILL IT INVOLVE?

If you say yes to participating in the research, I will ask you to participate in an in-depth interview. This should not take longer than 1 hour to complete and; with your consent, will be audio-recorded. Due to COVID-19 we cannot do the interview face-to-face. We can interview you by phone, skype or zoom, whatever you prefer. Also, I will kindly ask you to share your energy (electricity and gas) bill records, if they are available and you are ok with it. We would like to check the average daily usage and the average costs per day, energy charges (consumption and daily supply charges), and, if displayed, usage records of the previous 12 months.

ARE THERE ANY RISKS/INCONVENIENCE?

There are few, if any, risks because the research has been carefully designed. However, it is possible that you could find a couple of the questions uncomfortable and/or embarrassing. These questions are about the difficulty in paying the energy bills, how you budget to meet the energy costs, and what impacts the higher energy costs have had on your everyday life. In any case, you may refuse to answer any questions you don't feel comfortable about.

DO I GET PAID FOR PARTICIPATION?

No, there is no financial incentive for participating. As a compensation and acknowledgement for making yourself available for the interview duration, you will receive some practical advice and publicly available information about how to understand energy tariffs and energy consumption, how to get help with high energy bills (including information on how to seek an Energy Accounts Payment Assistance (EAPA) provider) and other ways to reduce energy bills.

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DO I HAVE TO SAY YES?

Participation in this study is voluntary. It is completely up to you whether or not you decide to take part.

WHAT WILL HAPPEN IF I SAY NO?

If you say no, there are no consequences and you will not be contacted again about this research.

If you wish to withdraw from the study once it has started, you can do so at any time without having to give a reason, by contacting Caroline Valente (☎: [redacted] / ✉: caroline.portovalente@student.uts.edu.au).

If you withdraw from the study, the interview recording will be erased, and the transcripts will be destroyed. However, it may not be possible to withdraw your data from the study results if these have already had your identifying details removed.

CONFIDENTIALITY

By signing the consent form, you consent to the research team collecting and analysing the information you provided for the research project. All this information will be treated confidentially. The interview recordings and transcripts will be securely stored, and only Caroline Valente, Sara Wilkinson and Alan Morris will have access to them. Your anonymity will be guaranteed with the use of pseudonyms on writing up the findings.

We would like to store your information for future use in research projects that are an extension of this research project. In all instances your information will be treated confidentially. In any publication, information will be provided in such a way that you cannot be identified.

WHAT IF I HAVE CONCERNS OR A COMPLAINT?

If you have concerns about the research that you think I or my supervisors can help you with, please feel free to contact us on ☎: [redacted] / ✉: caroline.portovalente@student.uts.edu.au/*sara.wilkinson@uts.edu.au*/*alan.morris@uts.edu.au*.

If you would like to talk to someone who is not connected with the research, you may contact the Research Ethics Officer on (02) 9514 2478 and quote this number ETH19-4018.

You will be given a copy of this form to keep.

NOTE:

This study has been approved by the University of Technology Sydney Human Research Ethics Committee [UTS HREC]. If you have any concerns or complaints about any aspect of the conduct of this research, please contact the Ethics Secretariat [on ☎: +61 2 9514 2478 or ✉: Research.Ethics@uts.edu.au] and quote the UTS HREC reference number. Any matter raised will be treated confidentially, investigated and you will be informed of the outcome.

UTS UNIVERSITY OF TECHNOLOGY SYDNEY

CONSENT FORM

ENERGY POVERTY, CLIMATE CHANGE AND OLDER AUSTRALIANS: ADAPTING RESIDENTIAL PROPERTY IN SYDNEY
(UTS HREC APPROVAL NUMBER ETH19-4018)

I _____ *[participant's name]* agree to participate in the research '**Energy Poverty, Climate Change and Older Australians: Adapting Residential Property in Sydney**', UTS HREC approval number (ETH19-4018) being conducted by PhD Candidate Caroline Valente, School of Built Environment – UTS (Building 5, Block C, Level 3 - 1-59 Quay Street, Haymarket, NSW 2001), Telephone: +61 (02) 9514 8885.

I understand that the purpose of this study is to understand the impacts of energy poverty on my everyday life, health and general wellbeing while also identifying the housing circumstances I live in that might be contributing to my energy poverty situation.

I have read the Participant Information Sheet, or someone has read it to me in a language that I understand. I understand the purposes, procedures and risks of the research as described in the Participant Information Sheet. I freely agree to participate in this research project as described and I am aware that I can contact Caroline Valente if I have any concerns about the research. I also understand that I may refuse to answer any questions and am free to withdraw my participation from this research at any time I wish, without consequences, and without giving a reason.

I have had an opportunity to ask questions to Caroline Valente and I am satisfied with the answers I have received.

I agree to be:
☐ Audio recorded

All the information I provide will remain totally confidential. In the reporting of the interview I will not be identified. I agree that the research data gathered from this project may be published in a form that:
☐ Does not identify me in any way
☐ May be used for future research purposes

I am aware that I can contact Caroline Valente if I have any concerns about the research.
I understand that I will be given a signed copy of this document to keep.

_____ ____/____/____
Name and Signature [participant] Date

_____ ____/____/____
Name and Signature [researcher or delegate] Date

NOTE: This study has been approved by the University of Technology Sydney Human Research Ethics committee. If you have any complaints or reservations about any aspect of your participation in this research which you cannot resolve with the researcher, you may contact the ethics committee through the Research Ethics Officer (on ☎: +61 2 9514 2478 or ✉: Research.Ethics@uts.edu.au), and quote the UTS HREC reference number. Any complaint you make will be treated in confidence and investigated fully and you will be informed of the outcome.

Appendix 8 - Distress protocol for interviews

ENERGY POVERTY, CLIMATE CHANGE AND OLDER AUSTRALIANS: ADAPTING RESIDENTIAL PROPERTY IN SYDNEY

PhD Candidate Caroline Porto Valente
Supervised by Professor Sara Wilkinson and Professor Alan Morris

UTS UNIVERSITY OF TECHNOLOGY SYDNEY

DISTRESS PROTOCOL FOR INTERVIEWEES

The interview guide has been carefully designed and it is unlikely that these interviews will result in a distressing result for the participant. It is the researcher's duty of care to ensure that there is a balance consideration of the benefits against the risks of the study. The researcher will ensure these strategies are put in place prior to commencing the interviews.

The main researcher will provide sufficient information regarding the risks and benefits of the research so that individuals may freely accept or decline participation. This information will be made available to the participant prior to the interview commencing. The following protocol will be put in place should a participant become distressed, agitated or upset during the interview.

1. The researcher will make it clear to participants that they do not have to answer a question if they feel it will evoke discomfort.
2. If the researcher realise that an interviewee is experiencing discomfort, she will change the discussion topic.
3. If more appropriate, the researcher will suggest the interview to be terminated.
4. If the participant wishes this to happen, the interview will be ceased.
5. The researcher will have a list of counselling services preferably in the Inner West that she can refer them to the interviewees, should they prefer to discuss their concerns with professionals.
6. If the interviewee has a general practitioner (GP) involved in her/his care, it may be more appropriate to refer his/her to his/her GP who is already familiar with their history and would provide continuity of care. In this case the options of a counsellor would be provided to the interviewee as well.
7. A follow-up phone call will be made by the interviewer the following day to ensure that the participant is well and to determine feasibility of a follow up interview to continue the discussion of other topics.

General List of Counselling Services:

- **Beyondblue**
Information and programs on depression, anxiety, etc.
Phone: 1300 224 636
Web: www.beyondblue.org.au

- **Black Dog Institute**
Educational, research, clinical and community-oriented facility offering specialist expertise in depression and bipolar disorder.
Phone: 9382 4523
Web: www.blackdoginstitute.org.au

- **Community Mental Health Services**
Day program of outings and activities for people with a mental illness. Referral required.
Phone: 1800 011 511

- **Mental Health Services for Older People**
A 24-hr mental health line.
Phone: 1800 011 511
Web: www.slhd.nsw.gov.au/MentalHealth/emergency.html

- **UTS Psychology Clinic**
Not-for-profit teaching/research clinic with low cost services. Expertise in stress, depression and anxiety.
Phone: 02 9514 7339
Web: https://www.uts.edu.au/sites/default/files/2018-08/UTS-Psychology-Clinic-Flyer-August-2018.pdf

- **Lifeline -** If immediate help is required
A confidential and 24-hour telephone crisis support line **13 11 14**
Website: http://au.reachout.com/EmergencyHelp

List of Bulk Billing[1] Counselling Services in Inner West Region:

- Existencial Practice – Summer Hill – ph: 0466 469 642
- Psychlinx Consulting and Psychological Services - Dulwich Hill – ph: 02 9090 2727
- Ann Wilson – Burwood – ph: 0402 522 793

DISTRESS PROTOCOL FOR INTERVIEWER

There is also the possibility that the interviewer experience distress during the interviews phase, as sensitive topics will be addressed. To assist the researcher in this research stage:
1. The researcher will have regular meetings with their supervisors;
2. The researcher will have the possibility of contacting the UTS Counselling Service (free of charge) and UTS Psychology Clinic (as mentioned above);
3. The researcher will always carry a mobile phone while working in the field and will share the contact details and location of the interviews with her supervisors for safety reasons.

[1] Medicare rebates are available for up to 10 individual allied mental health services in a calendar year.
The 10 services may consist of: GP or medical practitioner focused psychological strategies services; and/or psychological therapy services; and/or focussed psychological strategies - allied mental health services.