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Who is vulnerable to energy poverty in the Global North, and what is their experience?

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Abstract

Energy poverty is a fast rising government agenda in the Global North, and is subject to a substantial academic literature. Energy poverty is experienced when people do not have adequate access to energy services (light, heat, warmth, and cooling) to live a decent life. Plans to transition to a low-carbon economy in the Global North have raised concerns about the impacts of environmental policy on more vulnerable citizens. A just transition is highly risky for energy poor households, who enter into the transition at a disadvantage. Understanding this starting point is critical in ensuring the energy poor are able to participate in a just transition, and are not subject to further disadvantage. Here, using a realist evaluation approach, I summarize the empirical literature on the experience of energy poverty in the Global North, in doing so characterizing who tends to be vulnerable to this problem, and painting a picture of their life experience. I show how energy poverty links to poverty, and how people from commonly disadvantaged social categories (disabled people, single parents, and people from ethnic minorities) are more likely to experience energy poverty. I describe the homes of people experiencing energy poverty, and their coping practices, as well as outlining the effects of energy poverty on health, social life, and home finances. In conclusion, I point to the weaknesses and gaps in the current literature, and suggest some important avenues of research for the future. This includes bringing energy poverty evidence into more extensive conversation with a just transitions agenda.

This article is categorized under:

Human and Social Dimensions > Energy and Climate Justice
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energy poverty, energy transition, fuel poverty, just transition

1 | INTRODUCTION

Energy poverty is a fast rising government agenda in Global North nations (see e.g., Bednar & Reames, 2020; Feenstra et al., 2021; Kyprianou et al., 2019), and is subject to a substantial and growing academic literature. Energy poverty is experienced when people do not have adequate access to energy services (light, heat, warmth, cooling, etc.) to live a decent life (Simcock et al., 2016). Plans to transition to a low-carbon economy in the Global North frequently result in concerns being raised about the impacts of environmental policy on more vulnerable citizens, including those experiencing energy poverty. For instance, the European Green Deal, which aims for member states to achieve net zero by 2050, includes the aspiration "no person or place left behind" (European Commission, 2021a).

A transition to net zero is highly risky for energy poor households, who enter into the transition at a disadvantage. Understanding this starting point is critical in ensuring the energy poor are able to participate in the transition to net zero, and are not subject to further disadvantage through it. This is a matter of recognizing historical injustice, including the drivers of that injustice, understanding how that has affected experiences in the present and moving toward a more restorative approach (Golub et al., 2013). Combining restorative justice with climate positive change, often referred to a as a "just transition" (Heffron & McCauley, 2017; X. Wang & Lo, 2021), is a challenging objective; however, the first step of this process must be to better understand people's experiences in the present, in order to be able to conceive of solutions that offer some redress.

To that end, in this article I characterize the experience of energy poverty in the Global North, drawing on the empirical literature on this topic, both identifying who tends to be vulnerable to this problem, and painting a picture of their life experience. The review is shaped by a realist synthesis approach (Pawson, 2006), part of the process for which requires an articulation of the various contextual factors that shape people's engagement with interventions. This approach encourages a wide-ranging review of the literature aiming for theoretical rather than empirical saturation: we read the literature in order to pull together a complete explanation of the experience of energy poverty, rather than prioritizing the quantity or completeness of the sources used (ibid.). As such, I draw on a range of studies using diverse data types, variously reporting on the context in which interventions were implemented, or reporting on the experience of energy poverty more generally.

In this article, therefore, I summarize the evidence on the experience of energy poverty in the Global North, describing the types of people that are more likely to experience energy poverty, and the knock on effects of these experiences, with regards health and wellbeing, as well as living conditions, finances, and social life. I begin by outlining the broader conditions that shape vulnerability. I then show how energy poverty links to poverty, and how people from commonly disadvantaged social categories (e.g., disabled people, single parents, and people from ethnic minorities) are more likely to experience energy poverty. I describe the homes of people experiencing energy poverty, and their coping practices, as well as outlining the effects of energy poverty on health, social life, and home finances. I conclude by pointing to the weaknesses and gaps in the current literature, and suggesting some important avenues of research for the future.

2 | REVIEW METHOD

This article is an early output from the WELLBASED project on energy poverty and health, which uses a realist evaluation approach. The realist methodology, which starts with the question "what works, for whom, in which circumstances and why?," takes an iterative approach to building theory, switching back and forth between different bodies of evidence and theory building (Emmel, 2013). In the first instance, we look to the literature, to see what evidence already exists, in order to then go and test theories emerging from that evidence empirically. The method is realist synthesis (Pawson, 2006; Wong et al., 2013), a theory-driven approach to literature selection, looking for evidence from a range of data types to elaborate the answer to the key research question.

The evidence that I profile here was a result of a reading of the English language literature on energy poverty, with a particular focus on establishing the context of energy poverty. In a realist approach, the context is the circumstances, conditions, and environment in which an intervention takes place. Characterizing this can amount to an enumeration of things that affect the intervention, or, a relational and dynamic account of a system in which the phenomenon under study is experienced (Greenhalgh & Manzano, 2021). In this article, I attempt to do both of these things: producing a deep description of the experience of and conditions of energy poverty, as well as elaborating the links between the different aspects of the experience. Taking such an approach is supportive of a systemic understanding of energy poverty, which is characteristic of the approach to the topic in recent literature (Day et al., 2016; Middlemiss, 2020).

Given the huge amount of publications on energy poverty, this process cannot be fully inclusive, although the literature surveyed included a wide range of mainly peer-reviewed sources that relate to the following key areas:

1. health and energy poverty,
2. interventions for energy poverty (and health),
3. qualitative research on energy poverty, and
4. energy poverty in particular social contexts (e.g., single parents and energy poverty).

Note that the principal entry point here was the term "energy poverty" and the linked "fuel poverty." The review would have gleaned different insights if I had started with different terms (e.g., "energy insecurity" or "energy [in]justice"), but the focus on energy poverty was important in this EU funded project, given its prevalence in use in Europe. The key themes covered in the following sections were drawn out of an initial deep reading of about 60 articles, most of which used the term energy poverty. Later additions followed more general literature searching around specific linked terms (e.g., disability and energy poverty). The articulation of the key topics below is also informed by my work in this field in the last 10 years, which has resulted in a broad understanding of key characteristics and experiences of energy poor households.

It is worth noting that the existing literature on fuel or energy poverty is dominated by UK based research, given the history of the concept of fuel poverty, and its emergence as both an academic area and policy area in the UK. This is also partly due to the literature surveyed here being in English. There is a further bias toward European research in my reading, shaped by the use of "energy poverty" as a central term (as opposed to the more US oriented "energy insecurity") and chosen to compliment the focus of the larger research project. I have nevertheless drawn on research from across the Global North, hence the use of this term in the title of the article.

3 | BROADER CONDITIONS THAT SHAPE VULNERABILITY TO ENERGY POVERTY

Since our focus here is on understanding who is vulnerable to energy poverty, it is critical that we have a grasp of the broader conditions that shape this vulnerability. While the three commonly named drivers of energy poverty (poor energy efficiency, low incomes, and high energy bills; as established by Boardman, 1991) are relevant here, the literature engaging with this topic has broadened out to think about more political and spatial aspects of the problem. For instance, in this journal Bouzarovski points out the distinctive factors that produce energy poverty in post-socialist states (cold climates, inefficient dwellings, decaying infrastructure, high income inequality, etc.), in contrast to those in Southern Europe (inadequate heating systems, poor quality dwellings; 2013). Such structural determinants are critical in understanding the problem (Recalde et al., 2019). Structural determinants create change over time and in particular places, as in parts of eastern Europe where poverty and energy bills were growing faster than elsewhere in 2017 (Bouzarovski & Tirado Herrero, 2017), and indeed in the current (2022) "gas crisis," as energy prices in the home rise exponentially in many nations. When addressing energy poverty, then, the broader shaping conditions in a specific place and time are critical. I outline some of the critical shaping conditions below.

3.1 | Climate and infrastructure

Differences in climate have an effect on people's energy poverty, particularly with regards how cold winters are, and how hot summers are. The impact is felt in the additional costs associated with cooling and heating, as well as through a knock on effect on overall budgets for other needs such as food (De Vries & Blane, 2013; Gouveia et al., 2019; Nord & Kantor, 2006; Thomson et al., 2019). The condition of the housing stock in the place in question is also important: levels of insulation and state of repair of housing have a direct effect on levels of energy poverty, as well as the associated impacts (Peralta et al., 2017; Poortinga et al., 2017; Sharpe et al., 2020; Tonn et al., 2021). The presence or absence of heating and cooling infrastructures in particular places also shapes energy poverty, with some nations having limited access to central heating or cooling technologies (Gómez-Navarro et al., 2021). Investment in housing, heating, and cooling infrastructures is a matter of politics, and ensuring that energy poor households are beneficiaries of such investment requires a particular focus on redressing existing inequalities through infrastructural investment (Roelich, 2020).

This is apparent when we see that countries with very similar climates can have very different energy efficiency in buildings. For instance, Belgium and the Netherlands have average energy consumption per m^2 in residential housing of 262.7 and 152.5 kwh/m^2, respectively, despite having near identical climates (European Commission, 2021b). The intersection between climate change and energy poverty is apparent in the risks associated with anticipated hotter weather in the summer: people's ability to adapt to climate change is a particular concern, especially in places with poor housing, heating, and cooling infrastructure (Gasparrini et al., 2017).

3.2 | Social and political context

Alongside these climate and infrastructural conditions, there are further social and political determinants of energy poverty. Recalde et al., articulate some of the key structural determinants as: the (precariousness of) the labor market, the condition of the welfare state, the regulation of the housing market, including rental market, and the energy market (2019). The nature of the labor market and welfare state affect people's opportunities to earn a living wage. The regulation of housing and energy markets shapes people's cost of living. Other authors have emphasized the determining role of inequality in exacerbating levels of energy poverty: the more unequal a nation, the higher the energy poverty levels (Galvin, 2019; Galvin & Sunikka-Blank, 2018; Grossmann & Kahlheber, 2017). Further, the role of poverty itself in shaping energy poverty is critical, where higher absolute and relative poverty results in higher energy poverty (Galvin, 2019). Both inequality and poverty shape income levels and cost of living (known as the poverty premium; Corfe & Keohane, 2018).

All of these determinants stem from an overall political orientation: a more neo-liberal politics results in emphasis on market solutions, whereas a social democratic politics will result in measures being funded more progressively (see Owen & Barrett, 2020 for alternative ways of funding energy policy; and see Powell et al., 2020 for a review of welfare state models). Politics also affects the labor market (with precariousness of the labor market known to impact on energy poverty; Middlemiss & Gillard, 2015) and housing market, with the regulation of the rented sector, for instance, resulting in very different effects for the energy poor. As we move on to talk about who experiences energy poverty, it is also important to note the shaping influence of energy poverty policy. Understanding who counts as energy poor under particular national and local policies, and therefore who has access to support, is critical (Kerr et al., 2019; Middlemiss, 2017). This can also affect some of the social groups that are more likely to experience energy poverty. So for instance, the national definition of disability can shape people's access to benefits and employment, and in turn shape their energy poverty status.

4 | WHO EXPERIENCES ENERGY POVERTY?

Table 1 summarizes the literature in relation to which specific social groups are found to be more likely to experience energy poverty. We begin with the most common feature of the energy poor—people being on a low income. Energy poverty is understood as the inability to access adequate energy services, and while people could be energy poor without being income poor, and vice versa, there is a strong tendency for the income and energy poor populations to overlap considerably. As a result, those social groups that are more likely to experience energy poverty (e.g., disabled people, migrants, and single parents), are similar to those who are commonly income poor.

Being more likely to experience energy poverty is typically connected to being engaged in caring or domestic roles (Petrova & Simcock, 2021; Robinson, 2019; Sánchez-Guevara Sánchez et al., 2020), and being at home more (unemployed, retired, and caring responsibilities) (Anderson et al., 2012; Robinson, 2019) which also means that energy poverty is gendered. Recent evidence suggests that people's energy consumption is shaped by their upbringing, with people from wealthier and more highly educated families consuming more in adulthood irrespective of their present financial and social situation (Hansen, 2018). This suggests that underconsumption during an energy poor childhood will have long-lasting effects on energy using practices. There are also intersectional effects associated with being in more than one of the listed categories (for e.g., single parent households are more often led by women, on low-incomes and from an ethnic minority background) (Sunikka-Blank & Galvin, 2021). A detailed analysis of disabled households' energy consumption in the EU, for instance, shows that economically inactive disabled households are doubly disadvantaged by being out of work and experiencing ill health: these households earn lower incomes and are more energy poor than economically inactive and nondisabled households (Ivanova & Middlemiss, 2022).

TABLE 1 Types of people that tend to experience energy poverty in the Global North

General category	Specific feature	Evidence	Provenance
Income and employment prospects	Low-income households	This is a common feature found in all energy poverty research	Universal
	Unemployed adult in household	(Bienvenido-Huertas, 2021; Curl & Kearns, 2017; Kearns et al., 2019; Kose, 2019; Romero et al., 2018)	ES, UK, TU
	People with limited education	(Jessel et al., 2019; Kose, 2019)	INT, TU
Ethnicity and immigration	People from ethnic minorities, and indigenous people	(Bednar & Reames, 2020; Churchill et al., 2020; Churchill & Smyth, 2020; Jessel et al., 2019; Riva et al., 2021; Robinson, 2019; Q. Wang et al., 2021)	US, AU, UK, CA
	Immigrants	(Oliveras et al., 2020)	ES
	Low proficiency in English (in UK)	(Robinson, 2019)	UK
People from specific demographic categories	Near-elderly or older people	(Day & Hitchings, 2011; Eisfeld & Seebauer, 2022; Hitchings & Day, 2011; Oliveras et al., 2020; Riva et al., 2021; Tonn et al., 2021)	US, AT, UK, CA, Southern EU
	Disabled people	(Cronin de Chavez, 2017; Ivanova & Middlemiss, 2022; Riva et al., 2021; Robinson, 2019; Snell et al., 2015)	UK, EU, CA
	Women	(Feenstra & Clancy, 2020; Galvin & Sunikka-Blank, 2018; Jessel et al., 2019; Oliveras et al., 2020; Petrova & Simcock, 2021; Robinson, 2019; Sánchez-Guevara Sánchez et al., 2020)	INT, UK, ES, Southern EU, PL, GR, CZ
	Young people, and full-time students	(Butler & Sherriff, 2017; K. C. O'Sullivan et al., 2017; Petrova, 2018); (Bouzarovski et al., 2013; Morris & Genovese, 2018; Robinson, 2019)	UK, NZ
Particular household types	Single parent families	(Eisfeld & Seebauer, 2022; European Fuel Poverty and Energy Efficiency Project, 2009; Jessel et al., 2019; Kearns et al., 2019; Riva et al., 2021; Robinson, 2019; Sánchez-Guevara Sánchez et al., 2020; Sunikka-Blank & Galvin, 2021)	AU, INT, EU, UK, ES, CA
	Socially isolated people (infrequent family contact) or people living alone	(Kearns et al., 2019; Middlemiss et al., 2019; Riva et al., 2021)	UK, CA
	Large household size	(Robinson, 2019; Romero et al., 2018)	UK, ES
	Multi-occupancy/family household	(Bednar & Reames, 2020; Cauvain & Bouzarovski, 2016)	US, UK

While people in the categories listed in Table 1 will have different experiences in different places, according to the broader conditions that shape vulnerability outlined above, these social categories need to be taken into consideration when addressing energy poverty in a particular place. The likelihood is that where there is a gender equality gap, there is also a gender energy poverty gap; where there is a migrant population, we should look for a migrant energy poverty problem, and so on.

5 | WHAT IS THEIR EXPERIENCE?

It is important to remember that people need to access a range of energy services in order to live a decent life. So in assessing energy poverty in a particular place, it is worth considering if people might face particular challenges in accessing the full range of these: "space heating, water heating, space cooling, refrigeration, cooking, drying, lighting, electronic services, and appliance services" (Bouzarovski & Petrova, 2015). The majority of the literature reviewed,

being concerned with northern Europe, tends to focus on how people cope with the cold, and cold-related problems in the home (Simcock et al., 2016). There are also important challenges associated with the other services listed here. A key contribution in understanding experience has been from the qualitative research studies on energy poverty cited below, given that lived experience research attempts to better document and understand the day-to-day lives of the energy poor.

5.1 | What are homes like?

Energy poor homes are typically defined as energy inefficient or leaky buildings (Anderson et al., 2012; Bartiaux et al., 2021; Bouzarovski, 2013; Castaño-Rosa et al., 2019; Kyprianou et al., 2019), the lack of energy efficiency being a key part of many national definitions of the problem. Inefficient buildings result in low indoor temperatures in the winter, with indoor temperatures typically difficult to control (Anderson et al., 2012; Bartiaux et al., 2021; Bashir et al., 2013). In some parts of Europe, New Zealand and Australia there are also large numbers of homes with no central heating, which is a particular challenge in cold weather in the south (European Fuel Poverty and Energy Efficiency Project, 2009; K. C. O'Sullivan et al., 2017; Willand et al., 2020). The cold, and failure to adequately heat, typically creates problems of damp and mold, which can cause damage to the building itself, and damage to possessions (Anderson et al., 2012; Bartiaux et al., 2021; Hopton & Hunt, 1996). Alongside these building related challenges, households frequently have inefficient white goods, which increase their electricity bills, or failing or no white goods, resulting in failure to access important energy services (e.g., laundry) in the home (Bartiaux et al., 2021; Brunner et al., 2012; Simcock et al., 2016). For instance, Bashir et al. (2013) report on people having to boil water in the kettle to bathe with. Less is known about which white goods and other appliances people own, an area which merits greater research given the necessity of ownership of certain appliances for modern quality of life and social engagement (Simcock et al., 2016). Discomfort associated with the cold is widely reported, alongside a frustration with the lack of control that people have over building efficiency, and over choice of an efficient home (Bouzarovski et al., 2013; Middlemiss & Gillard, 2015).

5.2 | How do people live in their homes?

One of the well-known effects of energy poverty is that people engage in coping practices, sometimes to the detriment of their health, wellbeing or social life (Anderson et al., 2012; Simcock et al., 2016). A considerable number of these practices center around not using energy for heat, finding ways of reducing the costs by only heating when particular people are there, or by not heating at all. A summary of the coping practices found in the literature is shown in Table 2.

The precise practices that people engage in will depend on a number of contextual factors dependent on climate and personal priorities and needs. However, we can see emerging evidence of some patterns in who engages in which coping practices. Simcock and Petrova find that household practices associated with reducing energy use (such as those listed here) are gendered, and frequently undertaken by women rather than men (in mixed-sex homes; 2021), while

TABLE 2 Common coping practices of people who experience energy poverty in the Global North

Coping practices	Evidence	Provenance
Wearing extra clothes, rationing heating	(Anderson et al., 2012; Brunner et al., 2012; Day & Hitchings, 2011; Eisfeld & Seebauer, 2022; Gibbons & Singler, 2008; Gilbertson et al., 2006; Hitchings & Day, 2011; Willand & Horne, 2018)	UK, AU, AT
Self-disconnection/going without heat	(Anderson et al., 2012; Bartiaux et al., 2021; Brunner et al., 2012; Gibbons & Singler, 2008; Meyer et al., 2018; Willand & Horne, 2018)	UK, AU, AT, BE
Turning heat on for visitors only, or for certain family members only	(Middlemiss & Gillard, 2015; Willand & Horne, 2018)	UK, AU
Using less, or only one room in winter	(Anderson et al., 2012; Brunner et al., 2012; Grey et al., 2017; Liddell & Guiney, 2015)	UK, AT, INT
Going to bed in the daytime in winter	(Brunner et al., 2012)	AT
Using public buildings to keep warm	(Bouzarovski et al., 2013)	UK

men are more likely to take responsibility for making energy efficiency improvements. This amounts to women taking on the brunt of the daily work associated with energy poverty (due to the likelihood of them being at home more, and being more likely to do the household and caring work), as well as experiencing more of the emotional impacts associated with not being able to fulfill the needs of dependents for energy services, and constantly monitoring energy use (ibid.).

Note also that we have not listed here practices that are associated with worsening people's experience of energy poverty. People are not always aware of how to use homes and appliances most efficiently, and accepted and traditional daily practices are sometimes associated with detrimental effects on energy poverty. For instance, Willand et al. (2019, 2020) document that in Australia, people sometimes ventilate excessively in the winter, resulting in heat loss, or do not know how to use newly installed technology. In other instances, people are likely to be under-ventilating, and energy efficiency renovations result in more air-tight buildings which can result in mold and damp growth (Maidment et al., 2014). Some research shows that many energy poor respondents have a strong understanding of the cost of energy use (Bouzarovski et al., 2013; Middlemiss & Gillard, 2015), however, people are not always aware of the impacts that failing to access energy can have on them. For instance not everyone understands the health impacts of failing to access energy services (Bouzarovski et al., 2013; Critchley et al., 2007; Harrington et al., 2005; Willand & Horne, 2018), and many do not see the often unhealthy coping practices listed above as problematic (Bouzarovski et al., 2013; Chard & Walker, 2016; Critchley et al., 2007).

6 | WHAT ARE THE BROADER IMPACTS OF ENERGY POVERTY?

As well as the direct impacts that energy poor households experience documented above, there are three further domains in which we commonly see rather negative knock on effects. We detail health, social life, and financial impacts below.

6.1 | Health

Some people are known to be more physiologically affected by the cold and heat than others: older people, disabled, or chronically ill people and babies or infants are more physically vulnerable (Marmot Review Team, 2011). People's mental health is also frequently affected by energy poverty (Anderson et al., 2012; Curl & Kearns, 2017; Mohan, 2021). In general, people experiencing energy poverty are more likely to be in worse health, both physically and mentally (Kose, 2019; Lacroix & Chaton, 2015; Thomson et al., 2017). Further, there is likely to be a causal connection between increased ill health and tendency to experience energy poverty, with multiple studies showing that disabled people are more likely to experience energy poverty, implying that this is a rather vicious circle (Cronin de Chavez, 2017; Ivanova & Middlemiss, 2022; Snell et al., 2013, 2015).

Energy poverty is linked to a range of health difficulties summarized in the Marmot Review on this topic (Marmot Review Team, 2011) namely:

a. Cardiovascular disease,
b. Respiratory conditions,
c. Anxiety depression and stress, and
d. Increased risk of influenza, pneumonia, asthma, arthritis, and accidents at home.

Energy poverty is also linked to excess winter and summer deaths (Healy, 2003; Liddell et al., 2016; Marmot Review Team, 2011; Recalde et al., 2019; Wilkinson et al., 2001; World Health Organisation, 2019).

Alongside these direct effects, we also find health behaviors associated with poverty more generally. For example, people in energy poverty are more likely to engage in health risk behaviors associated with stress (smoking, alcohol, and overeating; Liddell & Guiney, 2015). We also find that some people go without food in favor of energy and feeding more needy others, a practice particularly apparent among parents (Bartiaux et al., 2021). In evaluations of the impact of interventions on energy poor households, Grey et al. (2017) find that people are less physically active before interventions, due to the fact that it is harder to exercise when you are constantly cold.

TABLE 3 Effects of energy poverty on people's social lives in the Global North

Social effect	Evidence	Provenance
Social life reduced (in winter) this leads to a loss of self-esteem and wellbeing	(Anderson et al., 2012; Bartiaux et al., 2021;Gibbons & Singler, 2008; Middlemiss et al., 2019)	UK, BE
People experience poor relationships in the household due to financial stress	(Gibbons & Singler, 2008; Middlemiss et al., 2019)	UK
Leisure activities and holidays reduced or nonexistent, limited access to culture	(Bartiaux et al., 2021; Gibbons & Singler, 2008)	UK, BE
Relationships with key service providers (e.g., landlord, energy company) are often poor	(Bartiaux et al., 2021; Middlemiss et al., 2019)	UK, BE
Feeling of powerlessness, having limited agency in society	(Bartiaux et al., 2021)	BE

These health effects have a knock on further effect on a number of other social factors, including employment, school, and social lives. There is indeed evidence that after interventions to address energy poverty, adults miss less workdays (Howden-Chapman et al., 2007), and children less schooldays (Bashir et al., 2013; Free et al., 2010; Howden-Chapman et al., 2007), likely principally as a result of reduced illness.

6.2 | Social life

There is emerging evidence that households with a good social support network are better able to cope with challenges of energy poverty (Brunner et al., 2012; Middlemiss et al., 2019). By extension, those living in socially isolated households are less able to cope (European Fuel Poverty and Energy Efficiency Project, 2009). Households' social lives are affected both inside and outside of the home, resulting in tension or limited ability to host visitors in the home, and a lack of engagement in a range of social activities outside the home. People also report feelings of powerlessness and a lowered sense of agency and belonging in society. This suggests a disempowerment associated with energy poverty, which can translate into disenfranchisement, and more complicated relationships with key service providers. Key social effects of energy poverty are listed in Table 3.

We also see the presence of stigma against poor people (Bartiaux et al., 2021; Middlemiss et al., 2019), and older people (Day & Hitchings, 2011; Hitchings & Day, 2011), which affects people's social life and the way they cope with energy poverty. For instance, older people are seen to need to present a positive impression to others, no matter the weather (Brown & Walker, 2008; Day & Hitchings, 2011; Hitchings & Day, 2011). Disabled people are also likely stigmatized in this context.

6.3 | Home finances

A wide range of evidence suggests that people experiencing energy poverty commonly cannot afford adequate energy services (Anderson et al., 2012; Bartiaux et al., 2018; Curl & Kearns, 2017; Welsch & Biermann, 2017; Willand et al., 2015), such households are not only frequently on low incomes, but also on unstable incomes (Middlemiss & Gillard, 2015). Households are also commonly in debt, or have been in debt to the energy supplier (Butler & Sherriff, 2017;Gibbons & Singler, 2008; Liddell & Guiney, 2015; Middlemiss & Gillard, 2015).

People's financial coping mechanisms in this context include:

a. Trading off heat/food/medical/transport/other "flexible" costs (Anderson et al., 2012; Bartiaux et al., 2021; Brunner et al., 2012; Gibbons & Singler, 2008), note that this can affect the quality or quantity of food bought;
b. Detailed and careful budgeting of energy to avoid high bills (Brunner et al., 2012; Middlemiss & Gillard, 2015); and
c. Deliberately incurring debt as a coping strategy (Gibbons & Singler, 2008; Liddell & Guiney, 2015; Middlemiss & Gillard, 2015).

The peculiarities of the energy market also have important impacts on the energy poor in some nations. For example, the energy payment method often impacts on the cost of energy. Energy poor households frequently prefer the more expensive prepay meters in UK (Anderson et al., 2012) and New Zealand (R. O'Sullivan et al., 2012) which allow them to budget their energy costs, and are more at risk of charges associated with direct debit in Austria (Brunner et al., 2012). In addition, energy poor households are sometimes overcharged for energy due to remaining with a supplier for a long time (Ambrosio Albala et al., 2020; Brunner et al., 2012; Willand & Horne, 2018) this may be associated with feelings of trust and loyalty to energy supplier (Ambrosio Albala et al., 2020).

7 | CONCLUSION

Interest in energy poverty in the Global North is burgeoning in both the academic literature and in policy and practice. This has resulted from a realization that people who do not have access to energy services experience detrimental effects, and that these are likely to be exacerbated in the light of ambitions to transition to a low-carbon economy. It is notable that many of the articles referenced here were published in the last 5 years, and international policy action from the EU, many members states and beyond has also blossomed in that timeframe. The summary of the literature I provide here is therefore a record of a number of developments in the field. Most notable here are the deeper understanding of the context of energy poverty: including a recognition of the role of broader conditions such as climate, infrastructure, poverty, and the politics associated with regulation of labor, energy and housing markets in shaping people's vulnerability (Section 3). The recognition that energy poverty is typically experienced by those with social characteristics associated with other forms of disadvantage is also a recent insight (Section 4), and acknowledging the intersectional effects here has been an important step forward. A further recent contribution has been the articulation of the experience of energy poverty (Section 5), linked to the engagement of qualitative methods in this field. Finally, the wider impacts of energy poverty on people's lives, including their health, social life, and home finances, links to a more systemic understanding of this problem (Section 6): with the inability to access energy services understood to close down a range of opportunities for people in numerous areas of their lives (Day et al., 2016; Middlemiss, 2020).

One of the values of describing the energy poor, their experience and the conditions that shape this experience, is to share these insights with policy-makers and practitioners, to allow more accurate, effective and nuanced action on this agenda. I hope that reflection on specific experiences of energy poverty in national or local contexts could be assisted by the various categories that I use to summarize the literature here. For example, if policy-makers and practitioners are unsure of who experiences energy poverty in their region, understanding local experiences of the types of people included in Table 1 would be a good start, as well as reflecting on how broader conditions might create different forms of vulnerability.

While the burgeoning interest in this topic has created a large range of evidence, there are still important research gaps. There are substantial differences between experiences in different nations, insights into Mediterranean (Oliveras et al., 2021) and eastern European (Buzar, 2007) experiences, for instance have already attracted some attention. A key focus for the future must be in understanding how the various factors articulated here manifest in different contexts, and how they interrelate to create effects for households in energy poverty. This means, for instance, understanding how the intersectionality of various forms of disadvantage affects different types of people in different national and local contexts. It is also means encouraging research that attempts to understand the full extent of the experience of energy poverty: including the direct impacts of failing to access energy services, as well as the less direct impacts on (for instance) health, financial, and social life.

Finally, there is further work to be done in bringing this substantial body of evidence on energy poverty into conversation with the just transitions agenda. The expertise summarized here reflects a deep and thoughtful interdisciplinary engagement with the experience of energy poverty, from which we can offer important insights into the potential challenges associated with a low-carbon transition for particularly vulnerable demographics.

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