

# Making a Case for Centring Energy Poverty in Social Policy in Light of the Climate Emergency: A Global Integrative Review

Ana Stojilovska\* , Harriet Thomson\*\*  and Adolfo Mejía-Montero\*\*\* 

\*Institute for Political Science, Centre for Social Sciences, Budapest, Hungary

\*\*University of Birmingham, Birmingham, UK

\*\*\*University of Edinburgh, Edinburgh, UK

Corresponding author: Ana Stojilovska, E-mail: [Ana.Stojilovska@tk.hu](mailto:Ana.Stojilovska@tk.hu).

---

*The recent polycrises of COVID-19, economic recession, and energy price increases have reinforced the critical importance of energy services – such as heating, information and communications technology, and refrigeration – to everyday societal functioning. Compromising access to these energy services, or energy poverty, limits social and economic development affecting education, health, and social participation. Energy poverty is impacted by climate change and climate-related policies – however, this nexus has been marginalised within social policy. We critically review literature at the intersection of climate change and energy poverty identifying policy approaches, tensions, and solutions of relevance for social policy. While tensions exist between efforts to mitigate climate change and energy poverty, climate-friendly mitigation of energy poverty requires better integration of social perspectives to disrupt current technical biases, recognising the characteristics and needs of individuals in energy poverty, and holistic governance approaches, especially involving the health and housing sectors.*

**Keywords:** Energy poverty, fuel poverty, climate change, climate justice, pillars of social policy.

## Introduction

Energy poverty is a complex, multidimensional issue that has been at the forefront of many policymakers' minds in recent years due to concerns over ever increasing energy costs. It is sometimes recognised via terms such as 'fuel poverty' and 'energy vulnerability', which all broadly allude to households being unable to secure materially and socially necessitated levels of energy services in the home (Bouzarovski and Petrova, 2015), such as heating, lighting, and use of appliances. Energy poverty is a globally occurring phenomenon (Pereira *et al.*, 2019; Stojilovska *et al.*, 2021; Thomson *et al.*, 2022) that is inherently socially and spatially variable (Robinson *et al.*, 2019), with vulnerability factors ranging from energy-related needs and practices, and precarity of housing, to welfare and state support, and social networks (Robinson *et al.*, 2019). The adverse outcomes of energy poverty include worsened physical and mental health (Thomson *et al.*, 2017), increased absences from school and work (Free *et al.*, 2010) and decreased social participation (Stojilovska *et al.*, 2021). It is important to distinguish energy poverty from broader issues of income poverty. As Boardman argues, it is "the crucial role of housing stocks – the

house, heating system and other energy using equipment” (Boardman, 1991: 221) and “the role of capital investments that distinguishes the fuel poor from the poor” (Boardman, 2010: 256).

Given the significance of energy poverty to human flourishing, it should be a core concern for the social policy discipline, yet to date, it has been relatively marginalised. This is in spite of the fact that energy poverty has been exacerbated in recent years by COVID-19 (Hesselman et al., 2021), and is expected to be compounded further by climate change and associated mitigation policies (Ürge-Vorsatz and Tirado Herrero, 2012). For example, rapidly increasing temperatures in some regions are predicted to shift energy needs from heating to cooling, increasing summer energy consumption, and modifying everyday practices. The use of carbon taxes and levies on electricity bills to fund climate policies could increase energy prices disproportionately, in turn increasing the number of those affected by energy poverty (Okushima, 2019; Ürge-Vorsatz and Tirado Herrero, 2012). More frequent natural disasters and extreme weather conditions impact vulnerable populations in low and middle income countries more heavily, affecting energy security and energy access (Hossain et al., 2020; Khan, 2019). Climate change will likely create new geographies of energy poverty, making existing vulnerable spaces, such as regions with more extreme climates, and their populations, more vulnerable.

This paper attempts to address this sidelining of energy poverty as a key social policy issue. We start by situating existing knowledge on energy poverty within the discipline, before moving on to an in-depth integrative review of energy poverty and climate change literature across all disciplines. From there, we develop a conceptual framework to study the impacts of climate change on energy poverty, and their relationships with the key pillars of social policy. We end by drawing out key conclusions, and recommendations for the discipline.

## Methods

This article emerged from discussions during two participatory online workshops hosted by the Social Policy Association’s Climate Justice and Social Policy group during November–December 2021, held with 100+ social policy scholars, policymakers, and practitioners. Following these events, a two-part research strategy was employed: firstly, a scoping review of key social policy journals to ascertain the nature of existing research on energy poverty in the discipline; and secondly, an in-depth integrative review of literature on energy poverty and climate change, published across all disciplines. The below diagram in Figure 1 visually summarises our research approach, complemented with further detail in the subsections under Methods.

### *Scoping review of social policy journals*

Defining what is ‘social policy’, and thus what counts as a social policy journal, is a difficult and contested task, especially given the interdisciplinary nature of the discipline. It is further compounded by issues previously identified by Powell (2016), who observed “One method is to draw on ISI Journal Citation Reports (JCR) fields... This has been criticized due to ISI’s limited coverage, especially in the social sciences and humanities, e.g. (Harzing and van der Wal, 2008), and is particularly problematic in fields such as social policy, which does not have a JCR field, but is spread over categories such as ‘social issues’, ‘social work’ and ‘public administration’.” (Powell, 2016: 652). To overcome this,

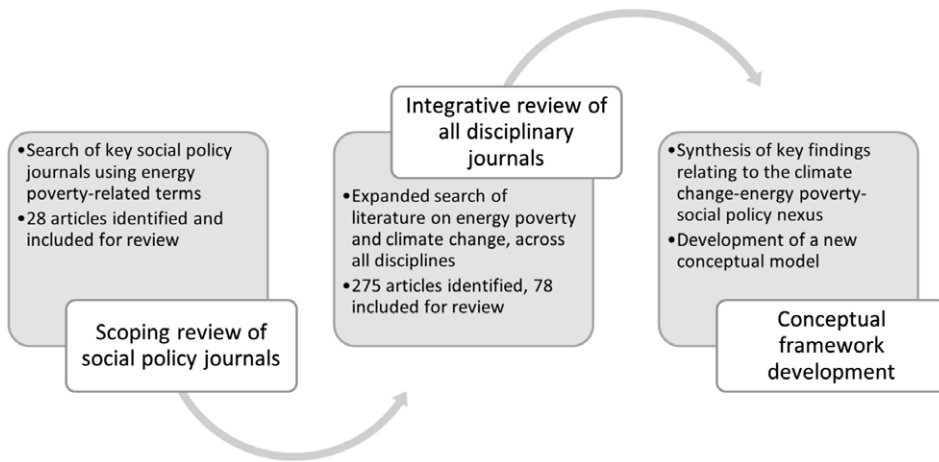


Figure 1. Visual summary of research process

a scoping search of journals owned by the Social Policy Association, Cambridge University Press, Bristol University Press, SAGE, Wiley, Elsevier, and Emerald Publishing was conducted, resulting in the following twelve journals that are directly concerned with social and public policy:

1. Journal of Social Policy
2. Social Policy and Society
3. Journal of International and Comparative Social Policy
4. Journal of Poverty and Social Justice
5. Evidence & Policy
6. Policy & Politics
7. Global Social Policy
8. Critical Social Policy
9. Journal of European Social Policy
10. Social Policy & Administration
11. International Journal of Social Welfare
12. International Journal of Sociology and Social Policy

This list also incorporates the ‘top’ five social policy journals previously identified by Powell (2016). A search of full manuscript text was conducted in August 2022, using the Scopus database, and the search terms: ‘fuel poor’, ‘fuel poverty’, ‘energy poor’, ‘energy poverty’, ‘energy vulnerability’, and ‘energy vulnerable’. In total, twenty-eight articles were identified, all of which were included for review.

#### *Integrative review of energy poverty and climate change*

Literature-based research can be developed through a variety of methods, such as systematic, integrative, and narrative literature reviews (Noble and Smith, 2018). While systematic literature reviews are methodologically rigorous and take a quantitative approach to extract information; in contrast, narrative reviews are identified as an

unsystematic, yet flexible method (Noble and Smith, 2018). An integrative literature review is used to synthesise the literature while addressing various research questions in a logical systematic manner, enabling meta-level findings and the building of conceptual frameworks (Ofosu-Peasah et al., 2021). Within this context, the combination of flexibility and rigour of an integrative literature review was considered well-suited for exploring the nexus between energy poverty, climate change, and social policy within the existent academic literature, which includes dealing with non-clear cut issues that could problematise the operation of rigorous criteria as required by systematic literature reviews.

The design of this integrative research was broadly based on the PSALSAR (Protocol-Search- Appraisal- Synthesis- Analysis- Report) framework, used to try to minimise subjectivity (Mengist et al., 2020). The different steps for the framework are shown in Table 1.

It is important to acknowledge that by limiting the search terms to the ones above, this research might exclude relevant literature that uses terms like 'energy access' or 'energy insecurity' to describe similar phenomena, particularly in terms of empirical research in the Global South. Therefore, there are opportunities to expand this research in the future with additional complementary terms, or by comparing how findings change using other search terms. Finally, and also related to limitations, it is important to acknowledge that the exclusion of complete books may result in missed information. However, in many instances resources like books are not accessible, and reviewing them exceeded the team's resources.

## Results

### *Scoping review of energy poverty research within the discipline of social policy: limited contribution*

Over the past four decades, just twenty eight articles have been published in social policy journals that mention energy poverty (or cognate terms) at least once across the article. When narrowed to mentions in the title, abstract, and keywords the figure is just six articles, as summarised in Figure 2 below, demonstrating the marginal position of energy poverty within the discipline. Of these twenty eight articles, twenty two focus on one or more of the United Kingdom's four nations, with a further three articles presenting single country studies of Ireland, Switzerland, and Zimbabwe, two comparative international studies, and one general piece with no geographical anchoring.

The first mention came from Morrissey and Ditch (1981), detailing amendments to the controversial 1971 *Payments for Debt Act* in Northern Ireland, first introduced in response to rent and rate strikes, and later expanded in 1978 to include gas and electricity due to concerns over growing debts and the difficulty for fuel boards to disconnect households as a result of heightened security during the Troubles. Therein followed a long break in publications until 1996 with a passing reference to energy poverty to housing and environment policy in the UK. It was not until 2004 that the first in-depth examination of energy poverty appeared in a social policy journal, with Wright (2004) outlining how government policies were failing older people, and issues of under-heating, narrow eligibility criteria for boiler schemes, and high energy bills. Energy poverty then continues to receive passing, or no mention until Gough (2013) examines the potential for domestic energy policies directed towards fuel poverty to moderate the distributional impact of

Table 1. PSALSAR framework for this integrative literature review

Phases	Tasks performed and methods applied
Protocol	Determining the scope of the research: <ul style="list-style-type: none"> <li>• Develop an integrative literature review of academic literature (articles, conference papers, reviews and book chapters) in English, from all countries and without time restrictions to explore the nexus between energy poverty, climate change and social policy.</li> </ul>
Search	Identification of search terms and database search: <ul style="list-style-type: none"> <li>• Scopus database was chosen as it is regarded as one of the most comprehensive and authoritative scientific databases (Vigolo et al., 2018).</li> <li>• Search terms identified: (Fuel poor OR fuel poverty OR energy poor OR energy poverty OR energy vulnerability OR energy vulnerable) AND (Climate change OR climate justice OR global warming OR environmental change OR environmental justice).</li> <li>• 275 documents were identified as of August 2022.</li> </ul>
Appraisal	Application of inclusion and exclusion criteria for selecting publications: <ul style="list-style-type: none"> <li>• For the 275 documents mentioned above, only documents showing a clear nexus between climate change and energy poverty would be included after a full read of the title and abstract.</li> <li>• Full reading of the abstract by two of the co-authors, each one votes “yes” or “no” for the document to be included. In case of disagreement, a third author would read the abstract to decide on including or excluding the document.</li> <li>• Seventy-eight documents out of 275 were included for the review (197 excluded).</li> </ul>
Synthesis	Develop a process for data extraction and categorisation: <ul style="list-style-type: none"> <li>• An analytical table was created to extract relevant information from papers, with the following categories: Country/ies of focus; socio-demographics of vulnerable group(s); consequences of climate change; policy proposals; nature of the energy poverty-climate change nexus; and key social pillars. Categories for “socio-demographics of vulnerable groups” were taken from the (QAA, 2019) Subject Benchmark Statement for Social Policy (leaving an option to add “other” missing groups). What constitutes the key pillars of social policy is a contested topic, with some seeing housing as the ‘wobbly pillar’ (Lowe, 2011). For the purpose of this research, we applied Hudson and Kuhner’s (2015) five pillars of welfare: social security, employment, education, health and housing.</li> </ul>
Analysis	Analysis of the data and results comparison: <ul style="list-style-type: none"> <li>• Identification of the main research findings and analysis via the analytical table.</li> </ul>
Report	Presentation of findings: <ul style="list-style-type: none"> <li>• Drafting a scientific article.</li> </ul>

carbon mitigation policies, via interventions to improve energy efficiency, reduce energy costs, and improve household income. In the same year, De Haro and Koslowski (2013) carried out a community-based study of fuel poverty in high rise apartments in Edinburgh, Scotland, finding that these buildings were of very poor quality and hard to heat, compounded by exposure to severe weather conditions, resulting in significant health

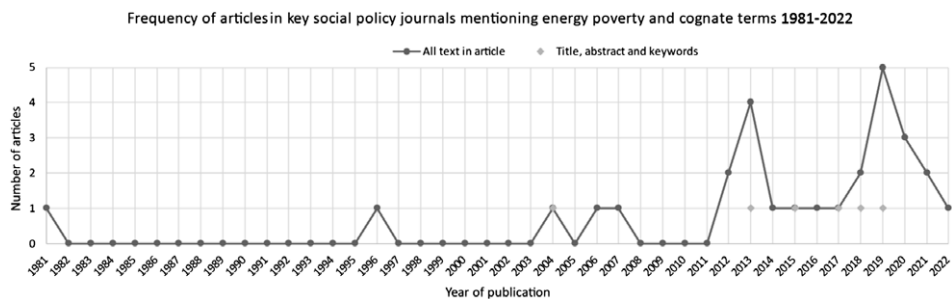


Figure 2. Frequency of articles in key social policy journals mentioning energy poverty and cognate terms between 1981-2022

impacts. Later, Snell *et al.* (2015) presented the first in-depth study of fuel poverty among disabled people in England, highlighting the highly varied needs and eligibility for fuel poverty and welfare support within this group, despite disabled people typically being treated as a homogeneous grouping. Subsequently, Middlemiss (2017) provided a critical take on the UK government's transformation of the politics surrounding fuel poverty policy 2010-2015, including the change from an absolute definition of fuel poverty to a relative measure, signalling a shift in considering fuel poverty as a policy issue that should and could be eradicated, to a condition that can at best be alleviated. In Snell *et al.* (2018), the concept of 'heat or eat' was explored, contributing knowledge around the importance of energy billing periods, household composition, and social networks in shaping household experience.

Until Forster *et al.* (2019), there had been minimal focus on ethnicity and fuel poverty within the discipline, which Forster and colleagues contributed to addressing with an evaluation of energy advice for Traveller Communities. Important contributions are also made by Chipango (2020), who provided the first non-British study, examining the pervasive social scarcity of electricity in Zimbabwe via the lens of social justice. The final study to engage meaningfully with energy poverty came from Bertho *et al.* (2021), who continued the internationalisation of the topic, with a study of energy efficiency and 'eco-social interventions' in Switzerland, in which they reveal the invisibility of fuel poverty as a policy concern. A commonality across all papers is a concern for distributional impacts, eligibility for government support, and revealing social injustices. However, except for a handful of papers, the intersection of energy poverty with climate change does not feature heavily.

#### *Integrative review of energy poverty and climate change: tensions and cohesion building*

The prevalence of social pillars and vulnerable groups mentioned in the reviewed articles is summarised in Table 2 and Table 3 by country category. We used World Bank country classification by income level of low, middle, and high income countries, calculated based on gross national income per capita (Hamadeh *et al.*, 2022). We listed as many social pillars and vulnerable groups as identified in each article, even if one article mentioned multiple categories. We can observe that housing and health are the most referenced social pillars, which are of significant concern to high income countries but not

Table 2. Mention of key social pillars in the analysed manuscripts shown by income level of referenced countries

Social pillars	Education	Employment	Social security	Housing	Health
Low income countries	1	1	2	/	/
Middle income countries	8	5	6	11	15
High income countries	5	7	8	29	20
Combination of countries with different income levels	5	7	5	13	15
<b>Totals</b>	<b>19</b>	<b>20</b>	<b>21</b>	<b>53</b>	<b>50</b>

Table 3. Mention of vulnerable groups in the analysed manuscripts shown by income level of referenced countries

Vulnerable groups	Age	Gender	Disability/Health	Ethnicity/Race	Social class	Energy poor	Rural
Low income countries	/	1	/	/	1	/	1
Middle income countries	3	6	1	2	7	4	9
High income countries	12	3	7	2	16	10	/
Combination of countries with different income levels	5	4	3	5	13	3	4
<b>Totals</b>	<b>20</b>	<b>14</b>	<b>11</b>	<b>9</b>	<b>37</b>	<b>17</b>	<b>14</b>

mentioned by articles concerning low income countries. Middle income country studies most frequently mention rural households as a spatially disadvantaged group, whereas high income countries do not mention them. Studies on high income countries deem social class, energy poverty, and age as the most relevant vulnerability categories, which is consistent with what these countries consider as relevant social pillars (housing and health) at the energy poverty and climate change nexus.

The consequences of climate change on energy poverty are discussed in various countries, particularly in low and middle income countries (LMICs), as well as in some high income countries with warmer climates. One of the key issues identified is higher temperatures during summer, which increase the demand for cooling (Castaño-Rosa *et al.*, 2021; Thomson *et al.*, 2019) and further exacerbate climate change. Summer energy poverty poses a clear threat to both electricity grid capacity and human health. Climate vulnerability affects vulnerable groups the most (Falchetta and Mistry, 2021; Okoko *et al.*, 2017). Moreover, users of traditional energy, such as fuelwood, are often stigmatised for using solid fuels exacerbating climate change (Pérez *et al.*, 2022). However, Munro

et al. (2017) contend that the climate change impacts of fuelwood consumption have been exaggerated; and, in the case of Sierra Leone, they have enabled the uncritical rollout of imported liquefied petroleum gas (LPG) across the country, leaving rural communities with reduced sources of income.

We have observed that energy poor and social class are among the most common vulnerability categories mentioned. This emphasises the close relationship between energy poverty and income, with climate change expected to significantly reduce households' ability to deal with increased energy prices. Energy prices can increase as a result of policies aimed at mitigating climate change, such as carbon taxes, or as a result of integrating renewable energy into the energy mix (Henry et al., 2021; Ürge-Vorsatz and Tirado Herrero, 2012). In some LMICs, dealing with the climate emergency is seen as an opportunity to kill two birds with one stone. This is meant by both mitigating climate change and improving energy access through renewable energy projects which will provide low-carbon electrification (Nadimi and Tokimatsu, 2018). This is especially relevant for rural populations lacking adequate access to modern energy services (Gebreslassie and Khellaf, 2021; Setyowati, 2020). To ensure inclusive participation, the agency of women is discussed. For example, some LMICs encourage the entrepreneurship of women to enable them to access the tools and skills necessary to participate in the energy transition (Antwi, 2022; Bhallamudi and Lingam, 2019).

A group of papers mention the need for cohesion between efforts to address climate change and energy poverty. This is because measures aimed at reducing energy poverty might increase energy use and carbon footprints (Chakravarty and Tavoni, 2013; Okushima, 2021). On the other hand, without a cohesive approach, energy poor households will likely be left out of opportunities to use renewables and energy efficient appliances (Powells, 2009; Suppa et al., 2019). Furthermore, some scholars advocate for 'sharing energy burdens and benefits' when deciding policy proposals (Sovacool et al., 2016) which aligns with energy justice scholarship claims (Sovacool and Dworkin, 2015). Nevertheless, when energy access and climate concerns clash regarding whether to build a coal power plant or not, research suggests that enabling energy access is a human right, but the source of energy matters as well (Bedi, 2018). An important aspect is to assess energy needs based on future climate predictions, especially for locations with harsher climates (Sánchez-Guevara Sánchez et al., 2018).

Most papers discuss the use of various technical measures to bridge the gap between reducing energy poverty and mitigating the impacts of climate change. In the LMIC context especially, renewable energy electrification has been identified as a clear solution (Bhide and Monroy, 2011). Many of the studied countries in this context, especially in rural areas, lack electricity access. Addressing the fundamental issue of energy poverty through climate-friendly energy access is suggested for these countries. By comparison, in high income economies, the proposed measures focus on improving the energy efficiency of housing. However, this policy can harm those in energy poverty where there are increases in rental prices resulting from energy efficiency improvements. The energy vulnerable cannot afford this increased rent and have to move, a phenomenon referred to as 'renoviction' (Grossmann, 2019). Additionally, vulnerable groups may not have the means to undertake energy efficiency interventions. Some common solutions discussed include solar water heating and low-cost cooling appliances, especially relevant in the context of material deprivation and increasing summer temperatures (Nicholls and Strengers, 2018; Worthmann et al., 2017).



A diverse set of social measures has been proposed to tackle the impacts of climate policies on the energy poor in the short and mid-term periods. The most common include social tariffs, energy subsidies, and direct financial support (Mayne *et al.*, 2017; Okushima, 2021). In some cases, there is an emphasis on overall consumer protection and even a disconnection ban (Nagaj, 2022). There is debate in a few cases about combining various social and technical measures, but there are also concerns that techno-economic measures may conflict with welfare policies (Webb *et al.*, 2016).

A dozen papers discuss the need to rethink the current governance system, including the participation of a wide range of actors, such as vulnerable groups (Hitchings and Day, 2011; Richardson *et al.*, 2008). For example, Bangladeshi activists have demanded the protection of energy rights and climate policies in a project with India that increases domestic emissions (Bedi, 2018). To alleviate energy poverty and mitigate climate change, community groups, energy initiatives, and collaboration, in general, should be prioritised. Many arguments in this direction stress the importance of understanding the needs of vulnerable groups, such as low-income households dependent on fuelwood. An interim solution could be evaluating fuelwood quality and introducing efficient stoves (Pérez *et al.*, 2022). The 'human' factor needs to be considered in housing or energy efficiency policies (Santangelo and Tondelli, 2017). For example, a priority is to refurbish the dwellings where the elderly live as they are the most at risk of increasing summer temperatures. When conducting energy efficiency assessments, occupant energy usage behaviour should be considered. Moreover, cross-governmental bodies can account for the cross-sectoral impacts of the tension between climate and social policies (Macmillan *et al.*, 2016).

## Discussion

There are several key tensions observed between energy poverty and climate change. First, it is the question of uplifting the energy poor from their state of material deprivation to being able to access modern and clean energy fuels but in a way that is not increasing emissions or local pollution. Second, due to climate change and subsequent increasing temperatures and cooling needs, the challenge is to satisfy these needs in a way that does not pose a financial burden to energy poor households or put them at health risk due to avoiding expenditure on cooling.

Indirect tensions can be observed through the increase of energy prices due to the integration of renewables or carbon taxes, which impacts especially the already vulnerable. On the other hand, restrictive environmental policies might affect the livelihood of vulnerable populations due to their dependence on cheap energy sources, such as fuelwood. Measures to address energy demand in the household sector can also shrink the access of the vulnerable to good quality housing, especially relevant in times of increasing temperatures and unpredictable weather events. Extreme cold weather caused by climate change can also increase the need to heat more.

We have established that policy approaches at the nexus of mitigating energy poverty and climate change in high income countries highlight the need to invest in high-quality dwellings and use climate-friendly cooling appliances. These policy suggestions, such as retrofitting and providing energy-efficient appliances, highlight the leading role health and housing sectors can play in mitigating climate change and energy poverty. On the other hand, in LMICs in which vulnerable populations are missing adequate (or at all) access to

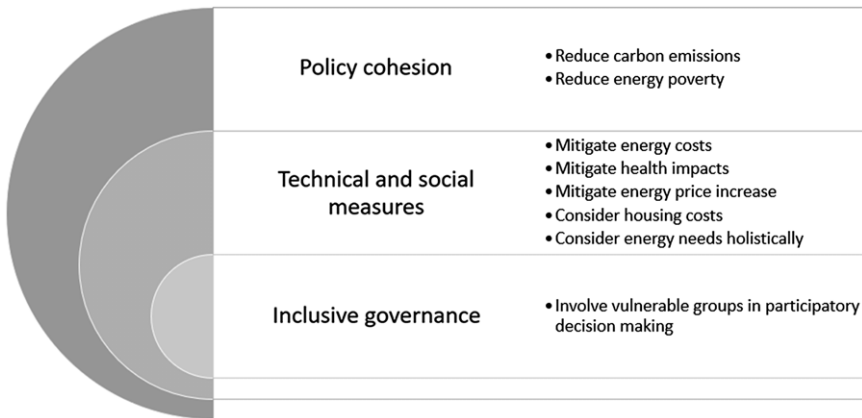


Figure 3. Creating a cohesive approach to tackle climate change and energy poverty

essential energy services, the suggestions go in line with using renewable energy potential to bring access to clean energy while mitigating carbon emissions (Pereira *et al.*, 2019; Tàbara *et al.*, 2020; Teixeira Lemba *et al.*, 2019). In this context, multiple social pillars are relevant, especially social security, housing, health, and employment.

Within the key social pillars, the health sector will be crucial to anticipating and adapting to the impacts of climate change. This is especially relevant in LMICs and high income countries with harsher climates. Because health is a prominent social pillar for old age, the elderly especially in high income countries receive attention (Shortt and Rugkåsa, 2007; Wright, 2004). The link between health, housing, and old age can be further explored by social policy to prevent climate-induced health impacts on the elderly and improve comfort and wellbeing through housing refurbishment. Overall, social security will be relevant to absorb the externalities of climate change, such as reduced food and fuel availability. This opens the discussion to considering energy as one of the ingredients of Universal Basic Services, such as water, housing, and mobility (Büchs, 2021). Many categories of vulnerability are insufficiently studied at the intersection of climate change and energy poverty, such as ethnicity, gender, age, and others, which should be urgently addressed if we are to achieve climate justice.

### Conclusion and policy recommendations

We reviewed literature at the intersection of climate change and energy poverty, identifying critical implications for social policy, and synthesising findings to develop a new conceptual model, drawing out the significance for social policy scholars.

In Figure 3 we illustrate our conceptual framework suggesting a cohesive approach to tackling energy poverty and climate change, relevant to both LMICs and high income countries. There has to be policy cohesion incorporating various policies, especially energy, social, health, and environmental to ensure climate-friendly mitigation of energy poverty. The approach would involve a combination of technical and social measures which consider the threats of climate change on vulnerable groups while being aware of their needs. Finally, an inclusive governance mechanism that actively involves the contribution of those with lived experience of energy poverty is needed.

Energy poverty is a complex multidimensional issue that sits across many government departments and disciplines, which may go some way towards explaining the limited attention to this issue within the discipline of social policy to date. However, as we have seen in section about the scoping review of energy poverty research within the discipline of social policy, there are significant and distinctive contributions to be made by social policy to the issue of energy poverty, and related discussions around clean energy transitions. The need to stay cool in summer emphasises the importance of good building quality, holistic heatwave plans, and the availability of accessible cooling centres. Social welfare support and social housing policies should be directed towards mitigating the increased cooling needs and costs of vulnerable groups. Furthermore, vulnerable populations already experiencing energy poverty will be severely affected by climate change consequences, including a wide range of adverse health and economic impacts prompting the need for adequate labour market, social protection, and health strategies. However, in an attempt to cope with rising energy prices, the use of solid fuels by vulnerable groups adds to carbon emissions deteriorating the climate change situation. Therefore, phasing out environmentally unfriendly fuels should be done only in line with a strong social policy that prevents further material deprivation of those already vulnerable.

Synergies and tensions exist between energy poverty and energy, climate, and social policies. The dominance of techno-economic approaches to understanding energy poverty silences or ignores social differences and differing needs, thus creating an opportunity for social policy to become a driving force in fairly tackling climate change. Thus, technical measures can be evaluated to create cohesion with social policy, while additional research needs to explore technical and social measures designed in cohesion to tackle both climate change and energy poverty. Future research should explore how climate change adds to the needs of vulnerable groups, how energy poverty is a matter of social and climate justice, and how climate policies can align with social policies.

### Acknowledgements

The support of the Social Policy Association's Climate Justice and Social Policy Group in organising the broader participatory workshop series is gratefully acknowledged. We would especially like to thank participants of the 'Fuel poverty' workshop theme for their time and ideas, with specific thanks to Karla Ricalde for critically shaping much of the early discussions, Courtney Stephenson for her support with initial scoping reviews of literature, and Lucie Middlemiss in leading breakout discussions. Financing from the University of Birmingham's School of Social Policy Research and Development Fund is also gratefully acknowledged. We would like to thank the Centre for Social Sciences for supporting the open-source funding. An earlier version of the article was presented at the conference 'Social Dynamics in the post-Covid age' organised by the Centre for Social Sciences in 2022. We are grateful to the anonymous reviewers for their constructive comments.

### References

- Antwi, S. H. (2022) The trade-off between gender, energy and climate change in Africa: the case of Niger Republic. *Geojournal* 87, 183–195. <https://doi.org/10.1007/s10708-020-10246-9>

- Bedi, H. P. (2018) 'Our energy, our rights': National extraction legacies and contested energy justice futures in Bangladesh. *Energy Res. Soc. Sci.* 41, 168–175. <https://doi.org/10.1016/j.erss.2018.04.009>
- Bertho, B., Sahakian, M. and Naef, P. (2021) The micro-politics of energy efficiency: An investigation of 'eco-social interventions' in western Switzerland. *Crit. Soc. Policy* 41, 188–207. <https://doi.org/10.1177/0261018320916712>
- Bhallamudi, I. and Lingam, L. (2019) Swaying between saving the environment and mitigating women's domestic drudgery: India's efforts at addressing clean cooking fuels. *Gend. Technol. Dev.* 23, 36–54. <https://doi.org/10.1080/09718524.2019.1587888>
- Bhide, A. and Monroy, C. R. (2011) Energy poverty: A special focus on energy poverty in India and renewable energy technologies. *Renew. Sustain. Energy Rev.* 15, 1057–1066. <https://doi.org/10.1016/j.rser.2010.11.044>
- Boardman, B. (1991) *Fuel Poverty: From Cold Homes to Affordable Warmth*. Belhaven Press.
- Boardman, B. (2010) *Fixing Fuel Poverty: Challenges and Solutions*. Earthscan.
- Bouzarovski, S. and Petrova, S. (2015) A global perspective on domestic energy deprivation: Overcoming the energy poverty–fuel poverty binary. *Energy Res. Soc. Sci.* 10, 31–40.
- Büchs, M. (2021) Sustainable welfare: How do universal basic income and universal basic services compare? *Ecol. Econ.* 189, 107152. <https://doi.org/10.1016/j.ecolecon.2021.107152>
- Castaño-Rosa, R., Barrella, R., Sánchez-Guevara, C., Barbosa, R., Kyprianou, I., Paschalidou, E., Thomaidis, N.S., Dokupilova, D., Gouveia, J.P., Kádár, J., Hamed, T.A. and Palma, P. (2021) Cooling degree models and future energy demand in the residential sector. A seven-country case study. *Sustain. Switz.* 13, 1–25. <https://doi.org/10.3390/su13052987>
- Chakravarty, S. and Tavoni, M. (2013) Energy poverty alleviation and climate change mitigation: Is there a trade off? *Suppl. Issue Fifth Atl. Workshop Energy Environ. Econ.* 40, S67–S73. <https://doi.org/10.1016/j.eneco.2013.09.022>
- Chipango, E. F. (2020) Rethorising the relationship between electricity scarcity and social injustice: evidence from Zimbabwe. *J. Poverty Soc. Justice* 28, 99–118. <https://doi.org/10.1332/175982719X15639725580596>
- De Haro, M. T. and Koslowski, A. (2013) Fuel poverty and high-rise living: using community-based interviewers to investigate tenants' inability to keep warm in their homes. *J. Poverty Soc. Justice* 21, 109–121. <https://doi.org/10.1332/175982713X668917>
- Falchetta, G. and Mistry, M.N. (2021) The role of residential air circulation and cooling demand for electrification planning: Implications of climate change in sub-Saharan Africa. *Energy Econ.* 99, 105307–105307. <https://doi.org/10.1016/j.eneco.2021.105307>
- Forster, N., Hodgson, P. and Bailey, C. (2019) Energy advice for Traveller Communities in the context of ethnic and spatial premiums: 'paying the price' for other people's choices. *J. Poverty Soc. Justice* 27, 61–78. <https://doi.org/10.1332/175982718X15451316707778>
- Free, S., Howden-Chapman, P., Pierse, N., Viggers, H., the Housing, H. and H.S.R.T. (2010) More effective home heating reduces school absences for children with asthma. *J. Epidemiol. Community Health* 64, 379–386. <https://doi.org/10.1136/jech.2008.086520>
- Gebreslassie, K. G. and Khellaf, A. (2021) A Review on Energy Access: A Case Study in Africa. *Int. Conf. Electr. Comput. Energy Technol. ICECET 2021*, 9–10. <https://doi.org/10.1109/ICECET52533.2021.9698488>
- Gough, I. (2013) Carbon Mitigation Policies, Distributional Dilemmas and Social Policies. *J. Soc. Policy* 42, 191–213. <https://doi.org/10.1017/S0047279412001018>
- Grossmann, K. (2019) Energy efficiency for whom?: a conceptual view on retrofitting, residential segregation and the housing market. *Sociologia Urbana E Rurale*, 78–95. <https://doi.org/10.3280/SUR2019-119006>
- Hamadeh, N., Van Rompaey, C., Metreau, E. and Eapen, S. G. (2022) New World Bank country classifications by income level: 2022-2023.

- Harzing, A.-W. and van der Wal, R. (2008) Comparing the Google Scholar h-index with the ISI Journal Impact Factor [WWW Document]. Harzing.com. URL <https://harzing.com/publications/white-papers/google-scholar-h-index-versus-isi-journal-impact-factor> (accessed 7.6.23).
- Henry, C.L., Baker, J.S., Shaw, B.K., Kondash, A.J., Leiva, B., Castellanos, E., Wade, C.M., Lord, B., Van Houtven, G. and Redmon, J.H. (2021) How will renewable energy development goals affect energy poverty in Guatemala? *Energy Econ.* 104, 105665–105665. <https://doi.org/10.1016/j.eneco.2021.105665>
- Hesselman, M., Varo, A., Guyet, R. and Thomson, H. (2021) Energy poverty in the COVID-19 era: Mapping global responses in light of momentum for the right to energy. *Energy Res. Soc. Sci.* 81, 102246. <https://doi.org/10.1016/j.erss.2021.102246>
- Hitchings, R. and Day, R. (2011) How Older People Relate to the Private Winter Warmth Practices of Their Peers and Why We Should Be Interested. *Environ. Plan. Econ. Space* 43, 2452–2467. <https://doi.org/10.1068/a44107>
- Hossain, B., Soheli, M.S. and Ryakitimbo, C. M. (2020) Climate change induced extreme flood disaster in Bangladesh: Implications on people's livelihoods in the Char Village and their coping mechanisms. *Prog. Disaster Sci.* 6, 100079. <https://doi.org/10.1016/j.pdisas.2020.100079>
- Hudson, J. and Kuhner, S. (2015) *The Short Guide to Social Policy*. Policy Press, Bristol.
- Khan, I. (2019) Drivers, enablers, and barriers to prosumerism in Bangladesh: A sustainable solution to energy poverty? *Energy Res. Soc. Sci.* 55, 82–92. <https://doi.org/10.1016/j.erss.2019.04.019>
- Lowe, S. (2011) *The Housing Debate: Policy and Politics in the Twenty-First Century*. Policy Press, Bristol.
- Macmillan, A., Davies, M., Shrubsole, C., Luxford, N., May, N., Chiu, L.F., Trutnevyte, E., Bobrova, Y. and Chalabi, Z. (2016) Integrated decision-making about housing, energy and wellbeing: a qualitative system dynamics model. *Environ. Health* 15, S37. <https://doi.org/10.1186/s12940-016-0098-z>
- Mayne, R., Fawcett, T. and Hyams, K. (2017) Climate justice and energy: applying international principles to UK residential energy policy. *Local Environ.* 22, 393–409. <https://doi.org/10.1080/13549839.2016.1206515>
- Mengist, W., Soromessa, T. and Legese, G. (2020) Ecosystem services research in mountainous regions: A systematic literature review on current knowledge and research gaps. *Sci. Total Environ.* 702, 134581) <https://doi.org/10.1016/j.scitotenv.2019.134581>
- Middlemiss, L. (2017) A critical analysis of the new politics of fuel poverty in England. *Crit. Soc. Policy* 37, 425–443. <https://doi.org/10.1177/0261018316674851>
- Morrissey, M. and Ditch, J. (1981) Social Policy Implications of Emergency Legislation in Northern Ireland. *Crit. Soc. Policy* 1, 19–39. <https://doi.org/10.1177/026101838100100303>
- Munro, P., van der Horst, G. and Healy, S. (2017) Energy justice for all? Rethinking Sustainable Development Goal 7 through struggles over traditional energy practices in Sierra Leone. *Energy Policy* 105, 635–641) <https://doi.org/10.1016/j.enpol.2017.01.038>
- Nadimi, R. and Tokimatsu, K. (2018) Energy use analysis in the presence of quality of life, poverty, health, and carbon dioxide emissions. *Energy* 153, 671–684. <https://doi.org/10.1016/j.energy.2018.03.150>
- Nagaj, R. (2022) Macroeconomic Policy versus Fuel Poverty in Poland—Support or Barrier. *Energies* 15. <https://doi.org/10.3390/en15134710>
- Nicholls, L. and Strengers, Y. (2018) Heatwaves, cooling and young children at home: Integrating energy and health objectives. *Energy Res. Soc. Sci.* 39, 1–9. <https://doi.org/10.1016/j.erss.2017.10.002>
- Noble, H. and Smith, J. (2018) Reviewing the literature: choosing a review design. *Evid. Based Nurs.* 21, 39–41) <https://doi.org/10.1136/eb-2018-102895>
- Oforu-Peasah, G., Oforu Antwi, E. and Blyth, W. (2021) Factors characterising energy security in West Africa: An integrative review of the literature. *Renew. Sustain. Energy Rev.* 148, 111259. <https://doi.org/10.1016/j.rser.2021.111259>
- Okoko, A., Reinhard, J., von Dach, S.W., Zah, R., Kiteme, B., Owuor, S. and Ehrensperger, A. (2017) The carbon footprints of alternative value chains for biomass energy for cooking in Kenya and Tanzania. *Sustain. Energy Technol. Assess.* 22, 124–133. <https://doi.org/10.1016/j.seta.2017.02.017>

- Okushima, S. (2019) Understanding regional energy poverty in Japan: A direct measurement approach. *Energy Build.* 193, 174–184. <https://doi.org/10.1016/j.enbuild.2019.03.043>
- Okushima, S. (2021) Energy poor need more energy, but do they need more carbon? Evaluation of people's basic carbon needs. *Ecol. Econ.* 187, 107081–107081. <https://doi.org/10.1016/j.ecolecon.2021.107081>
- Pereira, M.G., Silva, N.F.D. and Freitas, M.A.V. (2019) Energy transition: the nexus between poverty and CO<sub>2</sub> emissions in Brazil. *Int. J. Innov. Sustain. Dev.* 13, 376–391 <https://doi.org/10.1504/IJISD.2019.100398>
- Pérez, G., Islas-Samperio, J.M., Grande-Acosta, G.K. and Manzini, F. (2022) Socioeconomic and Environmental Aspects of Traditional Firewood for Cooking on the Example of Rural and Peri-Urban Mexican Households. *Energies* 15. <https://doi.org/10.3390/en15134904>
- Powell, M. (2016) Citation Classics in Social Policy Journals. *Soc. Policy Adm.* 50, 648–672. <https://doi.org/10.1111/spol.12254>
- Powells, G.D. (2009) Complexity, Entanglement, and Overflow in the New Carbon Economy: The Case of the UK's Energy Efficiency Commitment. *Environ. Plan. A* 41, 2342–2356. <https://doi.org/10.1068/a40347>
- QAA (2019) Subject Benchmark Statement: Social Policy.
- Richardson, J., Kagawa, F. and Nichols, A. (2008) Health, Climate Change and Energy Vulnerability: A Retrospective Assessment of Strategic Health Authority Policy and Practice in England. *Environ. Health Insights* 2, EHI.S950. <https://doi.org/10.4137/EHI.S950>
- Robinson, C., Lindley, S. and Bouzarovski, S. (2019) The Spatially Varying Components of Vulnerability to Energy Poverty. *Ann. Am. Assoc. Geogr.* 109, 1188–1207. <https://doi.org/10.1080/24694452.2018.1562872>
- Sánchez-Guevara Sánchez, C., Neila González, F. J. and Hernández, A. (2018) Energy poverty methodology based on minimal thermal habitability conditions for low income housing in Spain. *Energy Build.* 169, 127–140. <https://doi.org/10.1016/j.enbuild.2018.03.038>
- Santangelo, A. and Tondelli, S. (2017) Occupant behaviour and building renovation of the social housing stock: Current and future challenges. *Energy Build.* 145, 276–283. <https://doi.org/10.1016/j.enbuild.2017.04.019>
- Setyowati, A. B. (2020) Mitigating Energy Poverty: Mobilizing Climate Finance to Manage the Energy Trilemma in Indonesia. *Sustainability* 12. <https://doi.org/10.3390/su12041603>
- Shortt, N. and Rugkåsa, J. (2007) “The walls were so damp and cold” fuel poverty and ill health in Northern Ireland: Results from a housing intervention. *Part Spec. Issue Environ. Justice Popul. Health Crit. Theory GIS* 13, 99–110. <https://doi.org/10.1016/j.healthplace.2005.10.004>
- Snell, C., Bevan, M. and Thomson, H. (2015) Welfare reform, disabled people and fuel poverty. *J. Poverty Soc. Justice* 23, 229–244. <https://doi.org/10.1332/175982715X14349632097764>
- Snell, C., Lambie-Mumford, H. and Thomson, H. (2018) Is there evidence of households making a heat or eat trade off in the UK? *J. Poverty Soc. Justice* 26, 225–243. <https://doi.org/10.1332/175982718X15200701225205>
- Sovacool, B. K. and Dworkin, M. H. (2015) Energy justice: Conceptual insights and practical applications. *Appl. Energy* 142, 435–444. <https://doi.org/10.1016/j.apenergy.2015.01.002>
- Sovacool, B. K., Heffron, R.J., McCauley, D. and Goldthau, A. (2016) Energy decisions reframed as justice and ethical concerns. *Nat. Energy* 1, 16024. <https://doi.org/10.1038/nenergy.2016.24>
- Stojilovska, A., Yoon, H. and Robert, C. (2021) Out of the margins, into the light: Exploring energy poverty and household coping strategies in Austria, North Macedonia, France, and Spain. *Energy Res. Soc. Sci.* 82, 102279. <https://doi.org/10.1016/j.erss.2021.102279>
- Suppa, A., Steiner, I. and Streckeisen, P. (2019) Energy transition and environmental justice : effects on vulnerable groups and implications for social work. *Czech Slovak Soc. Work ERIS J.* 19, 32–47.
- Tåbara, J.D., Takama, T., Mishra, M., Hermanus, L., Andrew, S.K., Diaz, P., Ziervogel, G. and Lemkow, L. (2020) Micro-solutions to global problems: understanding social processes to eradicate energy

- poverty and build climate-resilient livelihoods. *Clim. Change* 160, 711–725. <https://doi.org/10.1007/s10584-019-02448-z>
- Teixeira Lemba, I., Ferreira Dias, M. and Robaina, M. (2019) Challenges and Planning in the Energy Sector in Africa. *WSEAS Trans. Environ. Dev.* 15, 544–599.
- Thomson, H., Simcock, N., Bouzarovski, S. and Petrova, S. (2019) Energy poverty and indoor cooling: An overlooked issue in Europe. *Energy Build.* 196, 21–29. <https://doi.org/10.1016/j.enbuild.2019.05.014>
- Thomson, H., Day, R., Ricalde, K., Brand-Correa, L.I., Cedano, K., Martinez, M., Santillán, O., Delgado Triana, Y., Luis Cordova, J.G., Milian Gómez, J.F., Garcia Torres, D., Mercado, C., Castela Caruana, M.E. and Pereira, M.G. (2022) Understanding, recognizing, and sharing energy poverty knowledge and gaps in Latin America and the Caribbean – because conocer es resolver. *Energy Res. Soc. Sci.* 87, 102475. <https://doi.org/10.1016/j.erss.2021.102475>
- Thomson, H., Snell, C. and Bouzarovski, S. (2017) Health, Well-Being and Energy Poverty in Europe: A Comparative Study of 32 European Countries. *Int. J. Environ. Res. Public Health* 14, 584. <https://doi.org/10.3390/ijerph14060584>
- Ürge-Vorsatz, D. and Tirado Herrero, S. (2012) Building synergies between climate change mitigation and energy poverty alleviation. *Energy Policy, Special Section: Fuel Poverty Comes of Age: Commemorating 21 Years of Research and Policy* 49, 83–90. <https://doi.org/10.1016/j.enpol.2011.11.093>
- Vigolo, V., Sallaku, R. and Testa, F. (2018) Drivers and Barriers to Clean Cooking: A Systematic Literature Review from a Consumer Behavior Perspective. *Sustainability* 10, 4322. <https://doi.org/10.3390/su10114322>
- Webb, J., Hawkey, D., McCrone, D. and Tingey, M. (2016) House, home and transforming energy in a cold climate. *Fam. Relatsh. Soc.* 5, 411–429. <https://doi.org/10.1332/204674316X14758447787663>
- Worthmann, S., Dintchev, O. and Worthmann, C. (2017) South African Low Pressure Solar Water Heating Mass Rollout Program and Its Impacts on Carbon. *Energy Eng.* 114, 47–66. <https://doi.org/10.1080/01998595.2017.11876935>
- Wright, F. (2004) Old and Cold: Older People and Policies Failing to Address Fuel Poverty. *Soc. Policy Adm.* 38, 488–503. <https://doi.org/10.1111/j.1467-9515.2004.00403.x>