

**Business As Not Usual: A systematic literature review of social entrepreneurship, social innovation, and energy poverty to accelerate the just energy transition**

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**Abstract**

*Energy poverty still affects more than 37 million people in Europe. Due to the COVID-19 crisis, this number may increase significantly. However, efforts to tackle this complex problem have thus far proved insufficient. The intersection of domains from different disciplines is increasingly relevant within energy social science. Social entrepreneurship has a mission to alleviate social problems. Thus, the role of social entrepreneurship and social innovation in tackling energy poverty, although still an emerging area of research, is receiving increasing attention. With an aim to contribute to assessing the state of the research on this topic, a systematic literature review was developed on the intersection between energy poverty, social innovation, and social entrepreneurship in countries in the Global North. The results of the review show the central dimensions of social entrepreneurship and social innovation outlined by researchers, such as the collective and network nature of social entrepreneurship, hybrid skills, proximity, involvement of households, and a user-centered approach, shedding light on the primary potentialities of interventions in energy poverty driven by the social entrepreneurship phenomenon. Such findings may help social entrepreneurs and innovators, as well as policymakers, recognise possibilities and challenges in the field. Based on the*

*outcomes of this review, potential new avenues for research within the intersection of the three domains are identified.*

## **Keywords**

Energy poverty, Social entrepreneurship, Social innovation, Literature review, Energy policy

### **1. Introduction**

The pathways towards low-carbon energy transition are faced with the challenge of including energy vulnerable households, which is an issue of growing interest in Europe [1]. Energy poverty refers to the difficulty or inability of a household to maintain adequate temperature conditions, as well as other essential energy domestic services, at a reasonable price. In 2018, according to the EU Energy Poverty Observatory (EPOV) [2], it is estimated that 37.4 million people were unable to keep their homes warm in the European Union, thereby experiencing energy poverty. If not specifically addressed by all actors, the consequences of the coronavirus pandemic could affect a greater number of vulnerable people, thus increasing energy poverty [3]. Some progress has been made towards tackling the problem, but it remains a pressing challenge that requires attention to the wide variety of causes and perspectives involved, as well as the efforts of a wide range of actors.

Energy poverty has been predominantly attributed to the triad of insufficient income, high energy prices, and energy inefficiency [4]. However, other approaches see this delimitation as partial, since it ignores factors of a different nature, such as information asymmetries, energy efficiency strategies or more human-centred approaches [5, 6]. Multiple actors form the energy poverty network, including governments, regulators, private companies, civil society, and public-private agreements [2]. However, research has dominantly focused on the role of public agents, while little attention has been paid to business actors as social

innovators tackling energy poverty [7]. Moreover, energy poverty can be characterized as a *wicked* problem given its complex, systemic, multidimensional, and frequently invisible nature, which requires the coordinated participation of multiple interrelated actors [8]. Therefore, hybrid approaches that bridge disciplines and domains are particularly appropriate to address energy poverty issues [9]. Social entrepreneurship provides a clear illustration of hybrid organization that encompasses a social mission together with skills and solutions traditionally based on market logics [10]. Social entrepreneurship is a loosely defined construct, but a mission related to solving social problems or to creating social value is widely accepted as a central feature [11]. Moreover, social entrepreneurship is often associated with social innovation since social entrepreneurs are searching for innovative solutions to meet social needs.

The dominance of partial approaches to complex problems calls for the need to adopt multi-actor approaches to energy poverty [12, 13]. In an attempt to respond to this call, we examine how the literature on energy poverty addresses the role of social innovation and social entrepreneurship in tackling energy poverty. The interest of the social innovation and entrepreneurship phenomenon to tackle energy poverty within the field of energy social science is of emerging relevance [14]. Social entrepreneurship is acknowledged to be a productive space for building effective responses to the problem of energy vulnerability due to its collaborative and hybrid nature [15], as well as its capabilities for leveraging resources through the energy poverty social network [16]. Potential contributions of social entrepreneurship to energy poverty might increase the number of innovative solutions for marginalized groups in the context of the inclusive energy transition from the lenses of energy justice [17, 18].

Since there are a great variety of examples of social innovation relevant to energy poverty, from the examples of Ashoka, discussed further below, to the Alliance against energy poverty in Barcelona [19], we examine the role of social innovation and social entrepreneurship

in tackling energy poverty. For that purpose, we carry out a systematic literature review on the intersection between social entrepreneurship, social innovation, and energy poverty. This intersection may be a productive space to question conventional management practices that will allow us to change the lens through which we look at the problem [18, 20]. Moreover, limited research has addressed the issue from interdisciplinary lenses, and there is a particular lack of systematic literature reviews in the field of energy social science [21].

Research addressing the role of the social enterprise in energy poverty is only emerging [1], despite the widespread presence of social business and social innovation initiatives with a mission to tackle energy poverty. In this regard, we note the impact of the program of Ashoka and the Schneider Electric Foundation to support social innovations in energy poverty in Europe. This three-year program varied the geographic scope in each iteration (Western, eastern, central European countries) and the projects were selected upon their maturity, impact, and commitment of their networks [22, 23]. Although energy poverty is a global problem [24, 25], it is also situational and varies along with the geographical context [6]. In the global North, the number of energy vulnerable people is increasing despite the growing number of interventions from both the private and the third sectors [26]. Research contributions on social entrepreneurship for energy poverty are still scant. This is specifically the case concerning poverty in the countries of the Global North [6]. In response to this call, our systematic literature review is focused on these countries [9].

In sum, this review intends to address the following research question: How social innovation and social entrepreneurship are addressed in the literature on energy poverty?

More specifically, this review responds to the following five research sub-questions:

- a) What perspectives on energy poverty are adopted in the literature in relation to social entrepreneurship and social innovation?

- b) What conceptualisations of social entrepreneurship and social innovation are used in the literature as addressing energy poverty?
- c) What types of solutions proposed by social innovation and social entrepreneurship as interventions in energy poverty predominate in the literature?
- d) What role is assigned to social entrepreneurship and social innovation in addressing the challenges of the inclusive energy transition?
- e) What are the implications for policy making in energy poverty emerging from social entrepreneurship and social innovation initiatives?

The remainder of the paper is structured as follows. Section 2 presents the background of interdisciplinary literature defining the key terms and suggesting potential for research in energy poverty and social entrepreneurship. Section 3 describes the methodology of the systematic literature review and the procedures followed. The results section (Section 4) identifies the main approaches adopted at the intersection through a comprehensive review of themes, methods, and topics [20]. In Section 5, we discuss our findings, pointing out some barriers and challenges for social entrepreneurs in energy poverty. In Section 6, the conclusions and research agenda are established.

## **2. Background**

Boardman [27] identified and made the energy poverty problem visible, considering political scepticism at the time. Although she was interested in an inter-disciplinary approach (policy, technology, economics, sociology), she provided the first definition in the UK in 1991, limiting the concept of energy poverty to cover households whose fuel expenditure on energy services exceeded 10% of their income. Since then, the UK has been at the head of energy poverty research, which has been progressively being extended towards many other countries in the Global North to account for local differences, such as demand for cooling in Southern Europe

[6]. Other approaches broaden the notion to include different dimensions of energy poverty, such as a ‘low income/high costs’ definition, in which households would need to have both a low income and high energy costs to be classed as fuel poor [28] or as a key determinant of health among the low-income population [29]. Most encompassing definitions refer to the absence of sufficient choice in accessing energy services to support economic and human development including multiple perspectives, more aligned with the complexities/multidimensionality involved in energy poverty [30, 31]. The definition by Day, Walker and Simcock [24] is a clear illustration of the broad approach:

*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.*

Such a holistic definition seems to be more appropriate than other narrower definitions when investigating responses to the energy poverty problem since it incorporates several elements and nuances and thus captures more aspects of the phenomenon [32]. This definition focuses on the energy services rather than energy per se, as well as on the capabilities framework, which may adequately respond to the dimensions of energy poverty.

In this sense, social entrepreneurship in energy poverty may focus on the debate about which specific services are considered fundamental (cooling, cleaning, household appliances, lighting, cooking but also entertainment and socialising or even charging a phone) or how the lack of energy services feeds the vicious circles of energy vulnerability [7]. Furthermore, identification and information about energy services concerning energy vulnerability factors [6] may be an interesting field for social innovation and social entrepreneurship. Also, the concern for the invisibility, stigmatization, and emancipation of vulnerable people, which have been widely addressed by energy poverty researchers [7, 24], could be engaging for social entrepreneurs. However, the social entrepreneurship initiatives in energy poverty and their

measurements and monitoring in countries in the Global North are very rarely addressed in the literature.

Although social entrepreneurship is already a mature field [33], there is neither a universal definition nor a single narrative of social entrepreneurship [31, 34]. Looking at social entrepreneurship in energy poverty, we adopt a broader meaning considering two elements: the mission and the collective dimension. First, the mission of the social entrepreneur as related to disadvantaged groups is not generally disputed [34]. Stricter approaches to the concept of social entrepreneurship require commercial and profitable business models through market-based activities for social purposes and normally face the challenge of managing the balance in the social–profit tensions [33]. Broader approaches go beyond the commercial perspective giving priority to the social dimension in social entrepreneurship to avoid the tensions affecting the social goals associated with economic value. In social entrepreneurship, the primacy is on the person and the social object versus share capital (notwithstanding the legal form).

Second, this study recognizes how the heroic individual theory of the social entrepreneur [35] is abandoned in favour of research on the major presence of the collective entrepreneur or the community-based collaboration among similar or diverse actors applying business principles to solving social problems [11]. Social entrepreneurship is a networked activity that introduces the progressive consolidation of more comprehensive definitions of social entrepreneurship as a collective endeavour, involving the collaboration amongst similar and diverse actors with the purpose of applying business principles to solving social problems [11, 12, 36]. The umbrella concept of collective entrepreneur includes terms such as community, or community innovation, resulting in a unified framework that facilitates a more cohesive body of research [37, 38]. Social entrepreneurship has been criticized for being a vehicle of neoliberalism to cover the wounds left by capitalism when it aims to provide public and essential services traditionally provided by the State [39]. The creation of policies for

supplying vulnerable customers is a concern typically addressed by regulation. The aspiration of social entrepreneurs to balance the market and social service logic is seen with scepticism when utilized to serve the collective interest [31]. However, the role of the social entrepreneur as a central actor in social transformation is also acknowledged, in particular within the literature on transition management.

This review includes the literature on social entrepreneurship and social innovation because both are connected and overlapping. Social entrepreneurship can be defined as the establishment of initiatives to implement social innovations within organisations of different sizes [40, 41]. Considering the synergies between these two concepts, social innovation is a broad concept and practice implemented through social entrepreneurship. Social innovation includes new processes, products, services, concepts, strategies, and tools that address social issues to support groups in enhancing well-being and improving people's conditions in society [42]. Therefore, social innovation and social entrepreneurship can be considered two sides of the same coin.

Once such a link between social entrepreneurship and social innovation is stated, we consider the literature of social entrepreneurship may be applied (albeit with caution) to explain how the agency of social entrepreneurs could approach energy poverty communities through social innovation. Concepts such as perceived moral legitimacy, empowerment, resistance, embeddedness, risk-taking, proactiveness, and diffusion of ideas are overlapping characteristics in social entrepreneurship and social innovation [42]. Therefore, both terms, social innovation, and social entrepreneurship, will be applied indistinctly hereafter.

These interrelated phenomena are a potentially powerful tool to facilitate the adoption of new logic to address complex social problems [16] within the context of sustainability transitions [43], where the multilevel framework identifies collective social entrepreneurs as

innovators at the niche level, highlighting their role in influencing at scale to produce effective changes in the incumbents of the regime [15, 44]. In this sense, we should keep in mind that social entrepreneurship and energy poverty are highly influenced and firmly embedded in their context, so researchers may consider different contextual and geographical settings while deploying their theoretical lenses [34]. The context of inclusive energy transitions is significant in foregrounding the problem of energy poverty and the vulnerability of energy rights [17]. The double challenge of the just transition aims to ensure the decarbonisation of global society without leaving anyone behind [3]. Therefore, conversations about the agency of niche actors as social entrepreneurs and innovators and their interaction in different levels to accelerate the transformation stand out in the sustainability transitions literature [14]. This study considers transitions a contextual framework for the phenomenon of social entrepreneurship in energy poverty rather than considering the just transition as the object or a fundamental objective of this research.

### **3. Methodology and overview of results**

#### *3.1. Methodology*

The first step in the systematic literature review was the identification of the keywords based on the background and reflection of the intersection between the domains of energy poverty, social entrepreneurship, and social innovation. The articles analysed were selected through a keyword advanced search using the “SUBJECT” field (including Title, Abstract, and Keywords detected by Web of Science (WOS)) from a previously selected database: the WOS core collection. WOS includes the following three databases: SCI-EXPANDED, SSCI, A and HCI, ESCI. Establishing this *practical* screen that does not include conferences proceedings or books, the focus on research-oriented context and strict filtering of only peer-review or highly rated journals relevant to the research areas was undertaken to maintain a high level of conceptual rigor and methodological quality [33, 44, 45].

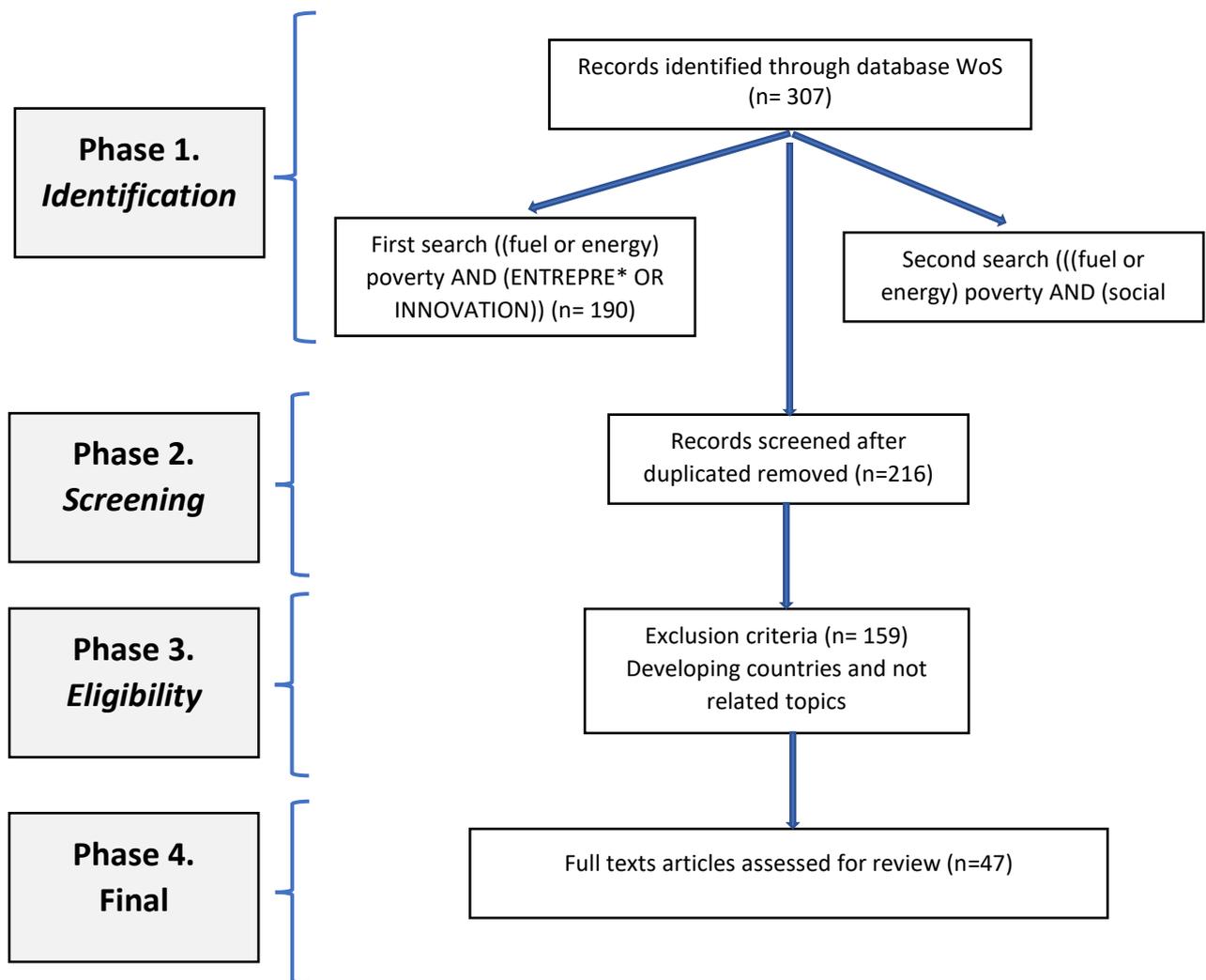
Various combinations of search terms resulted in two search strings. The first one (Search 1) was ((fuel or energy) poverty AND (ENTREPRE\* OR INNOVATION)), which found 190 articles. A second search string (Search 2) was (((fuel OR energy) poverty) AND (social (innovat\* OR entrepreneur\*))), which found 117 articles. In a second step, a comparison of the 307 articles was carried out and 216 duplications were removed. The use of these terms is justified by the intention of obtaining articles that focused on the intersection between social entrepreneurship (or innovation) and energy poverty, which are the terms commonly used by academics and professionals. The choice of a broader focus in relation to social entrepreneurship justifies the inclusion of the term innovation in the search, as mentioned above. Concerning the notions of social entrepreneurship and social enterprise, they are frequently used almost interchangeably in the reviewed literature [46]. The most widely accepted view is that domestic energy deprivation could be seen as a global problem (with no division between the Global South and North), and it is generally considered that all forms of energy poverty in developing and developed countries have a common characteristic, i.e. the lack of capacity to achieve a social and material level of domestic energy services at different sizes [24, 25]. Nevertheless, this systematic literature review is focused solely on countries in the Global North because mainstream literature differentiates between the affordability perspective of energy poverty in these countries and the access to energy perspective in low-income countries.

In line with this decision, in the third step, we manually reviewed all abstracts, excluding those unrelated to our research regarding developing countries, or specific to a particular industry but not energy-related (e.g., health, agriculture, water, food security). Where there was doubt about the content of an article, we retained it. The rationale for this exclusion is to limit, specify, and restrict the results as much as possible to articles whose main theme is

related to entrepreneurial and/or innovative solutions and energy poverty in developed countries.

In the final step, we carefully read the full content of all articles in detail and discarded those that did not meet our criteria but had not been detected as such during the review of abstracts. The final sample included 47 articles (see Figure 1).

Figure 1. Prisma flow chart of the systematic literature review



Source: Authors' elaboration

### 3.2. Overview of studies

We conducted a preliminary quantitative analysis of the articles to help us understand the current development of academic research at the intersection of social entrepreneurship/innovation and energy poverty. The citations of each article are relevant to identify academic interests, highlighting seminal papers in the review, that is, *to identify the giants* [45]. There are not many citations in any of the articles: seven articles have more than 100 citations, twenty articles have between 20 and 100, and the rest (twenty-five articles) have fewer than 10 (see Table 1. Methodology and Citations). Besides fulfilling the Pareto principle, this indicates that relevant attention to the literature dealing with the intersection is increasing.

Table 1. Methodologies and citations of each article of the systematic literature review

N°	Reference of papers selected in the Systematic Literature Review from 2020 back to 2007	Citations in 2021		Research methods	Themes/keywords
		Feb	Oct		
1	Campos, and Marín-González (2020)	3	16	Qualitative	Prosumerism, social movements, sustainability transitions, energy justice, energy democracy
2	Jenkins <i>et al.</i> (2020)	12	13	Conceptual	Value sensitive design, responsible research and innovation, energy justice, energy systems, conceptual review
3	Belaïd, Youssef and Lazaric (2020)	8	11	Quantitative	Energy efficiency, rebound effect, quantile regression, residential energy consumption, household behavior
4	Sovacool, Del Rio, and Griffiths (2020)	15	46	Mixed methods	Coronavirus, covid-19, energy policy, climate policy, energy governance, sustainability transitions
5	Pitt, and Nolden, (2020)	0	3	Qualitative	Social housing, solar pv, feed-in tariff; community energy, multi-occupancy buildings; fuel poverty; energy justice
6	Mechlenborg., and Gram-Hanssen (2020)	5	10	Conceptual	Gender studies; meaning of home; theories of practice; energy demand; energy transition; technology studies
7	Carley, and Konisky (2020)	16	69	Qualitative	Lower-carbon, energy transition, policy insights, justice, and equity dimensions
8	Streimikiene, and Balezentis (2020)	1	6	Quantitative	Energy, renovation, multi-flat buildings, barriers; willingness to pay, state policies
9	Longo, <i>et al.</i> (2020)	5	8	Quantitative	Energy poverty, fuel poverty, vulnerable consumers, vulnerable households, energy vulnerability, energy efficiency, customer engagement, energy citizenship
10	Youssif, Gatt and Caruana (2020)	1	2	Quantitative	Nearly zero energy buildings; smart building; energy renovation; social housing; energy storage; thermal comfort
11	Patkos <i>et al.</i> (2019)	2	3	Qualitative	Public policies, community innovations, climate change
12	Kalt <i>et al.</i> (2019)	39	62	Conceptual	Energy poverty, definition, energy services
13	Osunmuyiwa and Ahlborg (2019)	15	28	Quantitative	Entrepreneurship, employment, gender, and energy
14	Pueyo and Maestre (2019)	34	58	Mixed methods	Energy poverty, conceptual definition, gender
15	Sovacool, Lipson and Chard (2019)	34	58	Qualitative	Energy justice in household low carbon, Retrofitting innovations
16	Knuth (2019)	17	22	Conceptual	Retrofitting, green growth
17	Silvestre and Tirca (2019)	119	183	Quantitative	Literature review of innovation, sustainability
18	McCauley <i>et al.</i> (2019)	69	117	Conceptual	Energy justice, interdisciplinary energy research, low carbon
19	Power (2018)	3	3	Qualitative	Regional and municipality policies, climate change and social networks
20	Elia and Margherita (2018)	25	36	Quantitative	Conceptualization of complex problems
21	Jenkins, Sovacool and McCauley (2018)	111	160	Conceptual	Energy justice and humanizing, transitions, invisibility
22	Boerenfijn <i>et al.</i> (2018)	28	31	Qualitative	Innovations, energy efficiency, social housing, older adults
23	Martiskainen, Heiskanen and Speciale (2018)	31	37	Qualitative	Information, awareness, innovation
24	Claude <i>et al.</i> (2017)	32	37	Qualitative	Energy efficiency, innovation, municipality and university role, user's centre
25	Butler and Sherriff (2017)	23	27	Qualitative	Identification, young adults, awareness, and information
26	Picciotti (2017)	36	46	Qualitative	Social enterprises, sustainability, cooperatives, collaborative networks

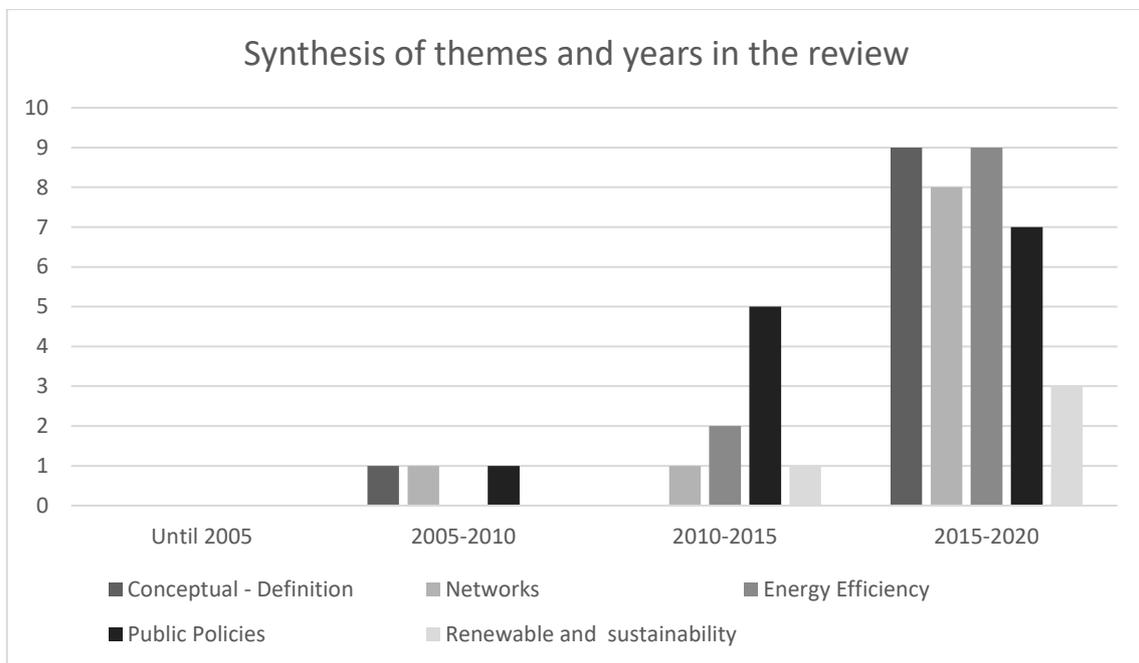
27	Dandara, Tabacaru and Danila (2017)	3	3	Quantitative	Role of the financial system for social welfare
28	Imaz and Sheinbaum (2017)	27	31	Qualitative	Science and technology, SDGs, networks, research
29	Boni, Leivas and De la Fuente (2016)	0	2	Qualitative	Innovation for human development, invisibility
30	Karlsson (2016)	10	13	Conceptual	Public policies, innovation, climate change
31	Okkonen and Letonen (2016)	70	79	Qualitative	Community wind power projects, rural public policies, social entrepreneurship
32	Sdei <i>et al.</i> (2015)	17	18	Quantitative	Retrofitting, public policies, social housing
33	Dineen, Rogan and Gallachoir (2015)	35	36	Quantitative	Innovation centres, energy efficiency, limitations to data gathering
34	Webb (2015)	34	41	Qualitative	Public policies, lack of coordination in networks, social innovation
35	Schaffrin and Reibling (2015)	39	43	Quantitative	Public policies, energy efficiency, climate change
36	Fu <i>et al.</i> (2014)	18	18	Quantitative	Public policies, heating, climate change
37	Bale <i>et al.</i> (2013)	59	65	Quantitative	Networks, energy technologies
38	Sovacool and Mukherjee (2011)	485	538	Mixed methods	Public policies, data gathering, energy security
39	Dyck (2006)	14	15	Quantitative	Planning, networks
40	Sahakian and Dobigny (2019)	5	6	Qualitative	Public policies initiatives, awareness. communication in networks, energy transition, reduction of consumption
41	Streimikiene and Balezentis (2019)	5	9	Quantitative	Public policies, retrofitting, Russia
42	Nunes (2018)	7	8	Mixed methods	Identification, older adults
43	Sovacool, Axsen and Sorrell (2018)	300	439	Mixed methods	Research in energy and science, excellency, energy social science
44	Santamouris (2016)	176	201	Qualitative	Innovating, energy efficiency, climate change
45	Costello <i>et al.</i> (2011)	82	90	Conceptual	Climate change, positive action
46	O'Brien and Hope (2010)	136	145	Qualitative	Public policies, localism and centralism, private funding, user focus
47	Brugmann and Prahalad (2007)	488	529	Conceptual	Private sector and third sector, networks relationship among Non-Governmental Organisations and companies

Source: Authors' elaboration. Number of citations accessed on February 20th, 2021, and October 3rd, 2021.

We filtered this search by publications until December 2020. An initial time restriction was not included since the treatment of the three domains together is relatively new, meaning that there is considerable previous literature about social innovation, social entrepreneurship, and energy poverty but not with the joint perspective. We did not include either any limitation on conceptual or empirical articles or on any type of methodology. Because the intersection of energy poverty, social innovation, and social entrepreneurship is an emerging issue, the articles

reviewed began to appear in 2000 with a steep rise of publications after 2015, mainly related to the growing interest from researchers towards the problem from a multi-actor and multi-level approach [43] (see Figure 2). Figure 2 also shows the topics addressed by the studies linked with each of our research questions, illustrating the growing interest in efficiency, but also policy implications of social innovation in energy poverty or the networked nature of energy poverty.

Figure 2. Timing of publications and themes of the articles selected in the review



Source: Authors' elaboration

Each step in the review is documented and content validity is confirmed by including the research community in the process [47]. Two factors motivated the methodology selection: to better assess the state of research at the intersection [20], and to understand how researchers dealt with social entrepreneurship in energy poverty and what innovative solutions were proposed [48].

The general overview of results shows four main features in the description of studies. First, regarding the disciplinary approach, it is remarkable that social science journals represented only 5% of studies in the energy field. This suggests the opportunity for scholars to focus on human-centred studies and consultation with people, addressing topics such as energy justice, social innovation or financial incentives [13]. For instance, the *Energy Research & Social Science Journal* attempts to cover these gaps. However, this review shows that the intersection still appears to be understudied and it elicits the opportunity to reinforce pre-research to obtain the necessary scientific utility as a theoretical development, but also as its applicability in practice [21]. In sum, this literature reflects the concern about the limited attention paid to the research on social entrepreneurship and social innovation in energy poverty and its inclusion in the political agenda [30]. The diversity of foci, methodologies, and lenses and the segmentation of actors into disciplines may tend to lead to inefficient approaches [49].

Second, in relation to the frameworks used in the articles reviewed, three main approaches stand out: the capabilities approach, the energy service cascade framework, and the energy justice theoretical perspective [8, 9, 50, 51]. Hence, while, as noted above, the extant literature on energy poverty eschews a human-centred approach, the work on the intersection between energy poverty and social enterprise demonstrates holistic, people-centred approaches, rather than a focus on the technological perspective of the problem.

Third, concerning the type of journals that published the 47 articles analysed, they were mostly related to energy and less to management domains. There were ten articles from the journal *Energy Research and Social Science*, seven (7) from *Energy Policy* and two (2) in *Energy Journal*. The rest of the journals only had one entry in the review and reflected diversity as illustrated by other publications such as *Technological Forecasting and Social Change*, *Environment and Planning A-Economy and Space*, *Energy and Buildings*, or *Applied*

*Geography*. As Sovacool [13] highlighted, the three main journals dealing with interdisciplinary discussions on the interaction of social and technical issues related to energy, the so-called *energy social science*, are *Energy Policy*, *Energy Research and Social Science*, and *Energy Journal*. The journal *Energy Research and Social Science* is expressly committed to human-centred approaches to energy related problems, integrating methods and concepts from social sciences to investigate the social system around energy technology [3, 13].

Finally, regarding the methodological designs used in each article of the review (see Table 1), we found four types of studies in our 47 papers sample: conceptual (9), qualitative (18), quantitative (15), and mixed methods (5). 38% of the articles reviewed were qualitative. This table indicates the methodology and epistemology in each paper as a starting point guide from where the authors are building [33]. This review identified a considerable number of qualitative research approaches, mainly using semi-structured interviews [60], case studies [12, 14, 52], or even participatory video [5]. The topics of these analyses are dominantly about social housing [52, 53], energy efficiency [54, 55], and retrofitting. The type of actors involved in the interventions vary from housing associations [56], local networks [57], and energy communities [14, 58] to energy cooperatives for further local development [59]. Fewer examples of quantitative methods were found, except in the selected papers on measuring indicators and quantitative energy models [54, 61].

The type of methodologies used by scholars reflects a balance between human interpretation and the quantitative measurement required to understand the highly variable context of energy poverty. Also, the reference to the research method of each of the papers included in Table 1 enriches the contribution with examples, not as blueprints or as models for collective construction [62]. The attention to the epistemological approach of the researchers examining the activity of social entrepreneurs or social innovators in energy poverty shows an increasing number of qualitative studies in which the object is beyond the identification of the

causes of energy poverty [63, 56]. Interpretive epistemologies commonly focus data analyses on tensions and perceptions of experiences of the phenomenon [64]. Thus, our review highlights the opportunity to use such lenses - different from those focused on explaining or demonstrating statistical relationships about the phenomenon - to grasp the social phenomenon of energy poverty through the study of organisations and help to maintain a close link between research and practice [62].

Sovacool [13] called attention to the gap between what energy researchers consider to be essential and what practitioners, utility commissioners, and politicians think and do. Especially in energy poverty, there are few connections between academic literature and actions coordinated by practitioners, resulting in a lack of structured solutions through scalable interventions. In other words, the literature on energy poverty tends to be inattentive to evaluating interventions in energy poverty. This review acknowledges the limited availability of relevant and comparable data, often collected for other purposes and the inexistence of reliable metrics to characterise energy poverty, which justifies a dominant focus of researchers on identifying and measuring vulnerability. Without those measurements, it is difficult to make and monitor policies oriented to the most vulnerable consumers. However, this review emphasises also the relevance of more qualitative and interpretive research approaches that may permit researchers to understand and integrate values, beliefs, and feelings with a more human centred-approach in a social world formed by multiple interpretations [42, 64].

#### **4. Results**

The findings in the review reveal a fragmented map of social entrepreneurship and social innovation solutions offered to address energy poverty, as would be expected for this emerging territory of responses to this pressing challenge. The papers tend to give social entrepreneurship a secondary rather than a central role in the problem of energy poverty, since political actors,

energy poverty dimensions, and relevant topics are dominant. The energy transition is the backdrop to the current research on social innovation/social entrepreneurship in the field of energy poverty.

From a careful examination of the selected articles, five main categories of themes were developed inductively: 1) perspectives of energy poverty; 2) roles and characteristics of social entrepreneurship in the network of energy services in energy poverty; 3) solutions offered by interventions in energy poverty; 4) the role of social entrepreneurship in addressing energy poverty in the context of the inclusive energy transition; and 5) the implications for policymaking in energy poverty from social entrepreneurship and social innovation. Underlying such diversity of themes emerging from the review, a common thread connecting energy poverty, social entrepreneurship and social innovation is found: a general concern about the opportunity to include more social enterprise approaches to tackling energy poverty.

#### **4.1. Conceptualizations of energy poverty in relation to social entrepreneurship**

The definition of energy poverty is not universal, and different definitions may encompass different causes, consequences, and ethical frameworks that underly the need to tackle energy poverty. Such variety has implications for the type of interventions authors find appropriate to alleviate energy poverty, as well as on the interpretations they make regarding the role of social entrepreneurship and social innovation.

First, when approaching the causes of energy poverty, most articles show that, although low income is assumed to be the main cause of energy poverty, other factors such as energy inefficient housing, institutional political factors, or the need to approach energy poverty from the notion of energy services are also emphasized [52, 55]: individuals or families do not demand energy itself but rather the services delivered by energy. Energy-poor households suffer the inability to attain a socially and materially necessary level of domestic energy

services. Thus, the relationship between energy services and human needs is central in the articles reviewed, since a better understanding of energy services may encourage the emergence of alternatives to current interventions, such as innovations enacted by social entrepreneurs [9, 14, 56, 65]. An 'energy services' conceptualisation could reveal new routes across multiple levels to eliminate fuel poverty or culminate in new integrated business models to deliver co-benefits. A clear illustration is offered in the work by Kalt *et al.* [50], in which a model called Energy Service Cascade is developed. This model identifies energy services, together with energy structures, functions, benefits, and values, along the whole energy chain. This approach widens the possibilities for creating social innovation initiatives and new social business models to meet basic needs and increase well-being through the provision of energy services, such as “space heat and cooling, developing energy concepts for buildings or monitoring energy consumption before and/or after implementation of efficiency measures” [50].

A second finding regarding the conceptualisation of energy poverty in the review is the significance of energy justice, generally used as the appropriate rationale and ethical framework to guide social innovation and social entrepreneurship initiatives [3, 9, 17, 51]. The energy justice frame is an emerging field that envisions a world where all individuals, across all areas, have safe, affordable, and sustainable energy [17]. Energy poverty affects the people who suffer from it, and energy justice requires reflexivity to reshape the work of energy companies [66].

Energy justice is a conceptual, analytical, and decision-making framework for understanding when and where ethical questions on energy appear, who should be involved in their resolution, and ultimately which solutions must be pursued to achieve a sustainable energy system underpinned by fairness and equity [51]. Interdisciplinary approaches that bridge disciplines and domains are particularly suitable to address energy justice issues [9, 13]. Poor

consideration of social issues and little focus on individuals in the energy transition can lead to injustice, so states and companies should also apply energy justice [17, 66, 68]. Non-systematic application of energy justice principles in energy poverty initiatives may lead to the non-inclusion of vulnerable people in the energy transition.

The root of the energy justice scholarship is evolving from the environmental justice frame, and greater direct engagement with energy justice frameworks is often missing [17]. Energy justice allows engaging with ethical dilemmas in the context of the energy transition framework. Calls for performing energy justice decisions in transitions must include care for ethical dilemmas like fairly distributing energy infrastructure and services, allowing attention to the anticipated future wishes of those currently marginalised [17]. Therefore, providing resonance to energy justice should be a priority when planning for more sustainable transitions [41]. However, this conceptual and analytical tool is not comprehensive as a decision-making tool, demanding further application in practice. In the review, we find two examples of implementation of the energy justice framework from a perspective on the insufficiency of information on energy services. Martiskainen *et al.* [14] study Energy Cafés as an example of how community action initiatives are often driven by social good rather than by pure commercial motives. Energy Cafés have been conceptualised as grassroots innovations providing advice on energy issues to the public. Also, the *green doctors* of the behavioural change programs of social housing strategies provide door-to-door energy advice for residents [52].

Therefore, the framework of energy justice intertwines with other dimensions of poverty in the interventions [51, 66]. Jenkins, Sovacool, and McCauley [17] differentiated between the practical terms of energy poverty and the more theoretical concept of energy justice, which, combined, enable social entrepreneurs to have the aspirational goal of tackling this complex problem. Such a goal will help social entrepreneurs in energy poverty to become

familiarised with the concept of energy poverty in a broader way and to guide decision-making. Elia and Margherita [8] also raise the difficulty of complex problems that need complex solutions and how social justice in the energy transition would lead us to energy justice principles. However, the terminology of this conceptualisation is still not precise and homogeneous among all actors involved [17, 66].

In sum, the intersection of domains under review makes this framework appropriate for legitimising entrepreneurial interventions in energy poverty. It may provide a shared vision for social entrepreneurship in energy poverty with a justice and person-centred approach specifically focused on vulnerable groups [6].

#### **4.2. Conceptualisations of social entrepreneurship in the network of energy services in energy poverty**

This section discusses the conceptualisations of the social entrepreneurship initiatives identified in the review. The results show that the role of social entrepreneurship is not treated homogeneously in energy poverty, demonstrating a lack of clear boundaries with which to define social entrepreneurship [36] that we discussed in the background section. The tension between social and economic mission, common in the social entrepreneurship phenomenon [33], also appears in social innovation in energy poverty. Still, this tension seems to be solved by giving prevalence to the social dimension. The reference to the commercial mission that may be part of the definition of a social enterprise does not appear in the review, except on rare occasions. For instance, the study from Boerenfijn *et al.* [52] uses four case studies to highlight economic profitability as an objective of the social housing initiative of Habion in the Netherlands. This paper investigates the financial aspects (e.g., crowdfunding) of the interventions related to the investments in better appliances in terms of electricity consumption, smart home technologies, or renewable energy.

Other papers show that the commercial dimension in social innovation is questioned to some extent, since the initiatives might fail more often due to commercial uncertainties. Innovation implies that significant changes must be adopted by community networks [46] to steadily allow the energy transition with new metrics, processes, and structures [9]. Thus, it requires action from all actors, given its complexity, dynamism, and uncertainty. In this sense, social entrepreneurship in relation to communities is clearly illustrated in the article on Energy Cafés [14], which refers to interventions to tackle energy poverty in areas such as energy literacy, energy poverty awareness, and billing information. It also explains the crucial role of grassroots innovations, i.e., “networks of activists and organisations generating novel bottom-up solutions for sustainable development” [69], driven by social good rather than by purely economic motives. In this respect, we should highlight the critical agency of social services assistance to implement palliative measures through isolated public or private interventions such as Energy Cafés in the UK [14].

Some papers are concerned with the role of community-based initiatives in tackling energy poverty with innovation [59, 70], commonly highlighting the relevance of the cooperatives in the energy field. For example, Picciotti [59] explores social entrepreneurship through the case study of some cooperatives in Italy, such as collaborative networks, with an emphasis on democratic governance, multivocality, the integration of the disadvantaged in qualified activities and the reinvesting of profits in the community. The collective side of social innovation applies to the organisations ability to innovate as a result of the collective capabilities and their activities and networks to reach their goals [42]. Community-based social enterprises are also studied by Okkonen and Lehtonen [70], who analyse the socio-economic impacts of eleven wind farms on those types of social enterprises as promising solutions for transforming rural areas.

### **4.3. Characteristics of the solutions offered by social entrepreneurs to energy poverty**

Regarding the solutions and interventions identified in the literature to fight energy poverty through social innovation and entrepreneurship, three common features stand out. First, they are predominantly based on both the identification of vulnerable households and the analysis of the indicators to gain a clear understanding of the causes [54, 63, 71]. Second, the social innovations studied usually encompass a diversity of perspectives in the subgroups of affected communities [72], as well as multiple actors participating in the interventions [68, 73]. Third, in many cases, the actors involved are not self-identified as social entrepreneurs, which reveals the lack of institutionalisation of the phenomenon of social entrepreneurship working with impoverished groups, as illustrated for example by the home energy advisors or *green doctors* [56].

On these bases, the types of social innovation and entrepreneurship initiatives studied include two foci related to the causes of energy poverty: to reduce energy consumption, and to empower individuals and groups suffering from energy poverty from collective action.

#### ***4.3.1. Social innovation and entrepreneurship to reduce energy consumption***

The relationship between energy poverty and home energy efficiency is developing both in the academic realm and in the European legal framework for housing renovation. The emphasis on alleviating energy poverty by reducing energy consumption and related expenditure revolves around increasing energy efficiency [74, 75, 76]. Solutions to tackle energy poverty based on energy efficiency issues are dominant in the review, ranging from palliative or light measures [56] to deep or more structural perspectives [77].

The perspectives on energy efficiency vary among the articles reviewed. Some papers are concerned with the role of retrofitting or renovation to address energy poverty to ensure healthy, energy-efficient, and carbon-free buildings for all since they see in retrofitting an opportunity to introduce green and inclusive energy efficiency measures [54, 55, 56, 57, 78,

65, 68, 75, 77]. These works refer to the need for a skilled workforce to carry out the energy retrofitting of old buildings by the private and public sectors.

Several authors study social innovation initiatives related to energy efficiency at household levels [74, 75], since decreasing domestic energy consumption is a way to tackle energy poverty that can be more manageable locally through social entrepreneurship initiatives. Sahakian and Dobigny [75] empirically verify how consumption patterns can provide much information about household time uses or lack of insulation, and therefore why focusing on changes in behaviour patterns could have reduced energy consumption.

Other initiatives focus on efficiency-based solutions on social housing, i.e., initiatives that provide housing to people with limited financial resources [52, 53, 73, 76]. They are oriented both to improve the lives of vulnerable people and to address one of the overarching causes of energy poverty: energy efficiency in homes. Community benefits gained through renovation works appear, for instance, in Boerenfijn *et al.* [52], who study an initiative on energy information asymmetry in social housing aimed at favouring energy savings for their residents. An illustrative example is that offered by Sdei *et al.* [56], who compare the results of two retrofitting interventions in social housing, using innovative social alternatives of behavioural programs with empowerment through energy advice and energy education programmes. Beyond the retrofit works, the objective is also generating energy savings, improving fuel bills, and minimising fuel poverty throughout the engagement of the community (not just at the level of individual households). Social activities, reaching otherwise ‘hard to reach’ households, formed an essential part of this strategy, so residents attended various meetings and workshops. [56]. There was a combination of community work with the *green doctors*, energy efficiency experts who visit people in their homes, helping vulnerable households to save money and stay warm. Their work was designed to enable and empower the local community. They had a very positive impact on engaging the residents in some of the

energy reduction practices and how capable residents felt in passing on energy-saving practices to other residents. The focus on individual and community interventions was essential for the success of those projects.

Finally, we note a lack of longer-term evaluation of energy renovation programmes that includes measuring the social impact and more comprehensive studies. The potential reduction of energy poverty usually is not quantified in advance. Since completed renovation programs have positive and negative factors, fundamental principles may be applied to the design of energy renovation programmes to maximise the social benefits. Such re-design may avoid the social risk of adverse outcomes, such as unaffordable rents after retrofitting, higher energy bills after new heating and payment arrangement, or lack of focus in the community [79, 80].

#### ***4.3.2. Social innovations and entrepreneurship to empower people through social networks and energy communities***

Overall, the collective dimension of the innovation and entrepreneurship initiatives to alleviate energy poverty is dominant in the papers examined [14, 57, 59, 60, 68, 70, 78, 81]. This finding is coherent with the collective social dimension often embedded in social entrepreneurship [37], as well as the extension of the concept of social entrepreneurship to that of community-based enterprises, integrating elements from commercial entrepreneurship and social network theory to show how community-based enterprises may differ from the standard notion of entrepreneurship [59].

Thus, a variety of examples of interventions, community action, and co-creation with a network perspective appears in the review reflecting the collective nature of the energy poverty problem [14, 57, 60, 78, 70, 68, 81]. For instance, Martiskainen, Heiskanen, and Speciale [14] describe how local communities approach energy poverty with innovations such as the Energy Cafés (United Kingdom). This research shows that energy poverty is essentially a poverty issue and is therefore very sensitive to the fear of stigmatization. As Sdei *et al.* [56] or Butler and

Sheriff [72] also highlight, social problems like energy poverty must be treated with special care and through proximity.

The study of the Living Labs in Cahors (France) shows the relevance of the network of actors in energy poverty. It offers an example of co-creation of innovation with vulnerable consumers, governance of collaborations and multidisciplinary work, as well as the relevant roles attained by the university and the municipality. The user-centred approach successfully brings about expertise among the several partners involved in the project [78]. O'Brien and Hope [68] also argue that privately funded interventions should pay special attention to the user vision and the non-commercialization of certain energy services. In turn, Picciotti [59] emphasizes the complexity of implementing renewable energy projects through local communities and how these initiatives may create new ways for local development with a human-centred approach.

When describing social innovation and entrepreneurship initiatives related to energy networks, a diversity of subthemes arises. Depending on the actor in the network, the levels of awareness and priority of the problem will be different [72]. O'Brien and Hope [68] refer to the skills of the members of the network and their learning capacity suggesting the need to share common goals. In this sense, trust, coordination, and communication are capabilities required in the relationships forged between the members of the networks to achieve the activation of all players [15, 17, 59, 70, 75, 77]. Bruggmann and Prahalad [82] propose adopting a combination of technical and managerial skills in third sector networks, aligned with Sovacool's [11] defence of interactive and collective processes to enhance innovation, commercialisation, and business development in energy poverty.

In sum, social innovation and entrepreneurship are a productive space for training all actors involved in energy poverty from a co-creative approach [58, 78, 81].

#### **4.4. The role of social entrepreneurship in energy poverty in the context of inclusive energy transition**

A recurring pattern in our review is the interrelationship between fighting climate change and alleviating energy poverty, either explicitly or implicitly [46, 55, 77]. Such an interrelationship is contextualized by the energy transition framework [3, 9, 17, 51], based on the idea of vulnerable consumers not being left behind in the energy transition, since they will suffer more from the consequences of climate change or the non-use of low carbon resources [58]. This approach is applied to specific groups such as older adults [52, 65], young adults [63], women [83], people in rural areas [70], and local communities [60].

It is argued that the effects of climate change are devastating on health and energy poverty, and we should move towards pragmatic and positive action [84]. For instance, Knuth [77] mentions the opportunities for entrepreneurship in green retrofitting entrepreneurs, and that only sustainability-based policies should be considered. Silvestre and Tirca [46] discuss the tensions between commercial innovation and sustainable, green, and social innovation, and defend the triple bottom line reporting for sustainable innovation.

The double challenge of energy transition and energy poverty addressed by social innovation is addressed by scholars, who underline the need to bring people to the centre of the energy transition. For example, Energy Cafés are local community initiatives providing face-to-face energy advice to people in a welcoming setting. Such settings address the identification and partial solutions to energy poverty and other areas of the energy transition by empowering communities [14]. In a similar vein, Cahors innovation lab is searching for user-centred solutions by providing retrofitting initiatives to address the high levels of deterioration and vacancy rate of dwellings and varied problems derived from fuel poverty [78].

Jenkins, Sovacool, and McCauley [17] redirect the energy poverty problem into the sustainability transition including renewable energy and social lenses. The concept of sustainability transition goes beyond renewable energy [75] and foresees paradigm shifts in energy use. The question of inclusivity, the right to energy, and energy justice are central in this system transformation so that the agency of all actors involved is crucial [66]. The transition framework brings visibility to energy poverty as a social problem in social entrepreneurship and supports the growth of private social innovation initiatives in this field. The inclusive transition is a process, and it demands a multi-actor approach [85]. Thanks to their hybrid nature, new social spaces created by social entrepreneurs may acquire more influence and relevant roles. Moreover, examining how social entrepreneurs and innovators overcome the challenges of the energy transition and the growing visibility of energy poverty in this context may develop more social entrepreneurship initiatives with the aspirational goal to tackle energy poverty and more attention from scholars to responsible research [66].

With a more critical approach to the decarbonisation process, Sovacool, Lipson and Chard [9] show how the challenges of decarbonisation and innovation in household energy services will bring new tensions and risks for houses in vulnerable situations. They suggest four typologies of technological changes (from incremental to more radical) to show low carbon innovations through the conceptual lens of energy justice. This paper illustrates the challenges emerging from this critical approach to decarbonization that social entrepreneurship engaged in alleviating energy poverty will have to face. Those challenges point also to the role of science and innovation and the Sustainable Development Goals in the green transition, as highlighted by Imaz and Sheinbaum [86].

The social side of innovation frequently remains hidden behind a technical agenda and business competition [42]. The environmental aspect is an underlying constituent in many articles because the energy transition is noted as a requirement to combat climate change. Thus,

the environmental dimension is predominant over the social one. For this reason, the literature has not yet sufficiently conceptualised social entrepreneurship where the primary or the sole mission is tackling energy poverty. Instead, energy poverty alleviation is usually a side effect of the conscious sustainability strategy of a principal business. However, social enterprise's engagement to achieve social goals [30], together with social awareness, are relevant for successful change [42].

#### **4.5. Implications of bottom-up social entrepreneurship and innovation initiatives on energy poverty public policies**

Among the papers examined, seven articles from *Energy Policy* make explicit contributions for policymakers and energy planners, including the role of social entrepreneurship and social innovations in public policy. From the review of social entrepreneurship experiences on energy poverty, we can draw policy insights to provoke and develop bottom-up, integrated, and better-informed public policies to tackle energy poverty [49]. More specifically, this section addresses policy insights into energy consumption, data collection, and modelling for energy poverty policymaking, as well as the need for innovative schemes and coordination of levels of government.

Energy provision is a highly regulated sector. Therefore, the influence of policymakers in minimising energy poverty is significant, as is evident in the constant references to policy insights in the review of the literature [71]. Silvestre and Tirca [46] recommend that policymakers adopt more radical approaches towards sustainable innovation to address the current social and environmental challenges and obtain additional insights into public policies about energy poverty. One of the aspirations of the interventions from social entrepreneurs in energy poverty is to trigger bottom-up public policies towards minimising energy poverty. Social innovation is characterised by their enthusiasm for bottom-up approaches [69]. O'Brien

and Hope [68] address the challenge for energy policy to work with environmental and social issues such as energy poverty in the case study of North Tyneside Council. They argue that interventions with a user-centred approach may improve the interaction with the energy system and provide more structured approaches to energy poverty.

Sovacool, Lipson, and Chard [9] justify the need to develop inclusive policies considering the justice tensions developed in the decarbonization process and the innovation in household energy services. The authors indicate who is at risk today from low-carbon innovations: consumers with prepayment meters who pay more for their energy, tenants and *those with no roof*, and people unable to purchase technologies. They also explain who will be at risk in the future: consumers without access to new energy services or rooftop PV, those who have no roof on which to sire solar PV and those with no access to low-carbon energy networks. They recommend that policymakers focus on the tensions of today instead of tomorrow's challenges. Therefore, since decarbonizing the household energy system also comes with justice tensions, collective social entrepreneurship, and innovation's role in understanding those tensions and addressing those challenges is an opportunity.

Webb [81] analyses the case study of a non-profit ESCO in Aberdeen (Scotland) and identifies a lack of clarity in the competence appropriation between State, region, and local government. The results unveil the lack of capability and technical experience in energy matters from local authorities as well as social and environmental issues related to energy projects, and they also highlight the lack of coordination in multi-party networks. Her work proposes long term approaches and tackling any confusion regarding the boundaries of energy poverty and climate change policies. Such tensions highlight where energy and social policies intertwine, but these conflict-specific misunderstandings represent critical challenges for social transformations.

Regarding policy insights from bottom-up approaches about energy consumption, Sahakian, and Dobigny [75] analyse fifty initiatives related to reducing household energy use in Switzerland and provides some findings from the participatory processes of engaging households in such initiatives. For example, how people engage in their everyday life with appliances or behavioural changes. This paper illustrates how long-term solutions co-produced by participatory processes may increase the efforts to make household energy uses more efficient depending on the diversity of the user and the everyday practices within different contexts. Policymakers involved in energy policies should foster participatory initiatives and acknowledge their insights because collaborations between different actors who have come together have benefits in two directions: first, they encourage public sector learning from associations, social movements, cooperatives, and researchers; and second, they provide more diversity to policy agendas.

The relevance of data collection and the modelling of energy use and consumption to avoid exclusion errors in political measures is also addressed by researchers. For instance, Bale *et al.* [57] study public sector interventions to increase the uptake of low carbon technologies for domestic energy use and alleviate energy poverty. They build a ‘social networks’ mixed model that may serve as a tool for local authorities to design and assess the strategy of their interventions. Their results suggest more research into energy innovations in energy poverty is required, to achieve consolidation of the field and ensure its diffusion to larger audiences. This paper proposes that local authorities use this model to maximise energy efficiency and retrofitting in households.

Some papers emphasise the need for attractive, innovative schemes for entrepreneurs operating within different scales of enterprise. In the context of Lithuania, Streimikiene, and Balezentis, [73, 74] highlight the fact that holistic, well-targeted schemes could encourage an increase in bottom-up interventions [87]. They also propose ways to implement energy justice

principles through, for example, life-line tariffs for renovation, which imply sharing the costs among apartment owners, depending on their incomes.

Finally, there are also insights related to the coordination of levels of governments and regions to address energy poverty. In this sense, we find a call to the moral obligation of rich countries to implement global sustainable innovation policies arguing that innovation is mainly a state obligation [88]. This obligation reveals the tension between the inclusive transition challenge and the development of regional, local, and rural renewable policies. At the European level, it is relevant the review of Longo et al [89] of the main research trends of projects addressing energy poverty in this region.

Concerning the critical role of municipalities in energy poverty, two papers stand out. Okkonen and Letonen [70] study a case of wind projects in Northern Scotland to highlight the problem of political competencies. This study provides evidence of the lack of technical capacity in local administrations to face complex problems like sustainability and energy poverty. They find it is not common for a project coordinator position to be held by local authorities and not by private entities, but it is rarely the case that such public leaders are fully trained in all technical and social skills. Patkos *et al.* [60] research on Hungarian municipalities pays attention to local communities as relevant agents versus the central government in the origination of adequate responses to energy efficiency and renewable energy sources.

#### **4. Discussion and research agenda**

This systematic literature review showed the main themes identified in the intersection of energy poverty, social entrepreneurship, and social innovation. In order to take a step further, this discussion suggests some theoretical and practical implications derived from the review for the social entrepreneur and social innovation to promote and institutionalize their activity to mobilize other actors, especially policy makers, in tackling energy poverty.

First, the review highlights the relevance of the energy justice perspective [17] as an overarching framework for underpinning bottom-up local social innovation initiatives and top-down public policies from a holistic perspective. Scholars emphasise that a systematic application of energy justice principles in energy poverty initiatives may encourage inclusivity in the context of the energy transition [51, 68, 71]. Thus, more theoretical research is necessary to study energy social entrepreneurship and social innovation in energy transitions from justice lenses as an integrative and comprehensive framework to adopt a common language across the energy poverty network [9, 46, 66].

Second, our findings call for more consideration of the adequacy of the hybrid nature of social entrepreneurs to tackle energy poverty, since they may have acquired both technical skills related to the knowledge of the complexities of the energy systems, and social skills related to their proximity to energy users suffering from energy poverty. Specific knowledge, experience, and skills are needed to deal with energy poverty, given its difference from other aspects of poverty. Furthermore, as energy poverty is marked by collective and network dimensions, the research reviewed emphasises how social entrepreneurs working in energy poverty have developed the corresponding focus on building trust, communication, and other coordination skills directed towards the activation of all players [15, 17, 59, 70, 75, 77]. Therefore, social entrepreneurs might play a productive role in training all actors involved in the problem of energy poverty from a co-creative approach [82] paying special care to the active involvement of the vulnerable people.

More research on the attributes of social entrepreneurs as coordinators and intermediators could help increase the awareness and visibility of the energy poverty problem. A prior reflection on which type of new ways of collaboration and the reason for the need, are questions that need to be posed, including the transference of capabilities among private and public actors with a focus on a wider impact and a single objective shared by the whole network

to eradicate the problem of energy poverty [14]. The exchanges of resources and the improvement of the relationships between the members of the fragmented social network around energy poverty need to be analysed in-depth, including the challenges of communication, active listening, information, and awareness of social changes. The agency of the social entrepreneur as an intermediary may help to ensure the involvement of human-centred aspects in energy democracy [5, 68, 78]. The social side that appeared sporadically in some papers more focused on technical or traditional energy business, may be scrutinised through the sustainability plans of the growing number of renewable energy projects or decarbonisation projects promoted by the transition. Social aspects are gaining relevance since their non-consideration may put the development and execution of those urban or rural projects at risk. It may be an opportunity for social innovations in energy poverty to institutionalise and be part of good practices in sustainability plans of renewable energy projects. The findings reflect the relevance and fragmentation of the network in energy poverty and raise new considerations for the social entrepreneur and social innovation interventions. The unclear identification of the different members of this network and the unclear role of the social entrepreneur [50] in the energy poverty network suggest the potential for developing coordination and intermediary capabilities [33]. The robustness and strength of ties in the network is key for the alleviation of energy poverty. However, it is neither properly coordinated nor connected [57, 81] since not all actors have adequate levels of information, awareness, and training, especially in public administration [8, 14, 78, 72, 77]. Moreover, the relationships between climate change issues and energy poverty are often misunderstood [55, 74]. The hybrid nature of social entrepreneurs might effectively mediate in such a fragmented network while future transition literature studies might focus on the agency of actors, strategic niche management, transition management, and multi-stakeholder partnerships theories.

Third, the interventions by social entrepreneurs examined by researchers we identify reveal an opportunity to explore further the domains of energy efficiency, social housing, and green retrofitting as practical solutions to tackle energy poverty that different actors may develop in the energy poverty network [25, 54, 57, 55, 56, 65, 77, 81]. Beyond dominant approaches focused on income-based solutions, more user-centred approaches, humanizing development, and co-innovation with vulnerable consumers are more aligned to the complexity of the problem [5, 68, 78].

The fourth implication is that bottom-up public policies could promote innovation and energy efficiency in a more inclusive way [70]. There is a lack of a defined global legal environment, with a mixture of competencies between several levels such as regional and municipality policies in Europe to combat climate change and social inequalities [12, 60, 61, 65, 81, 88]. European energy poverty policies focus mainly on consumer protection, financial interventions, energy savings measures, energy efficiency and renewable energy development, and information provision [26]. However, those policies could be improved by integrating social innovation aspects through the insights from bottom-up initiatives from other actors working with higher proximity and allowing the empowerment of the vulnerable communities. The high number of papers found in the review that include policy insights reveals a perceived lack of control and weak leadership of the problem. The responsibility for tackling energy poverty seems to be considered to fall to the public sector, but this focus of responsibility may explain the isolation of community initiatives in promoting bottom-up public policy creation [59]. Future studies on the co-responsibility of actors could promote the replication of good practices.

Additionally, no study is without its limitations. First, the selection of the keywords might have left out initiatives that may also respond to the same concept but do not appear in this research and might have been overlooked. Second, excluding articles from non-impact

journals, conference proceedings, or languages other than English limits the inclusion of all relevant articles to ensure quality [45]. Moreover, we point out that hidden local social innovation or entrepreneurship realities are currently happening and emerging in social innovation niches in practice. Most of the relevant and more innovative ones (as the Ashoka referred to in section 1) are still not research-driven and subject to the study of energy poverty or social innovation/entrepreneurship scholars.

Despite the limitations, we have systematically explored the state of the research in the intersection of social entrepreneurship, social innovation, and energy poverty, which is expected to increase in the energy transition context in a multi-actor and multilevel approach [66]. While we have found very little social entrepreneurship research examining the energy poverty field and only a few studies engaging with related concepts, theories, and perspectives, we have also identified areas that deserve further scholarly attention. Addressing questions of “what is next” for the nexus between social entrepreneurship and energy poverty scholarship and defining patterns and categorisations in the review may help state several avenues for research.

Further research on private (or public-private) interventions in energy poverty should help design better-informed public policies. Proximity and an understanding of the context by social entrepreneurs are a source of social innovation that can provide new lenses and valuable ideas for policymakers to develop energy poverty strategies. The review highlights the lack of an appropriate framework for analysis and action to tackle energy poverty through harmonized approaches to clear policy guidelines. In this sense, much of the existing literature on energy poverty focuses on the early stages of the process (e.g., objective, and subjective indicators [54, 90], identification of vulnerability [72, 72] or the use of smart metering [52]. Thus, more research on interventions could pay closer attention to scaling and long-term perspectives of

bottom-up innovations to significantly reduce energy poverty and not merely produce quick solutions in response to emergencies.

As Jenkins, Sovacool, and McCauley [17] point out, transitions require more fluid, coordinated, multisectoral action to reform the various domains with high greenhouse gas emissions, such as energy (including heating) and industry, and to harmonize them in a systemic strategy that involves societal actors. Solid political incentives and more integrated programs should lead the energy system transformation to operate inclusively. Public plans and policies should respond to the multiplicity of needs, interests, and preferences of groups and people. They should consider the needs of vulnerable customers, but they could also foster actors such as social entrepreneurs who may play crucial roles in the energy transition. In this sense, policymakers could look into the multiplicity of perspectives in energy poverty to understand the agency and effects of bottom-up interventions from social entrepreneurs and social innovators to carefully establish and implement more holistic policies that foster human-centred activities and integrate more varied information and knowledge.

Public policy on energy poverty and general poverty should co-evolve constantly with technical progress and with consideration of the views of communities. Therefore, more research should be carried out into the objectives of clear public policies towards effective and integrative interventions on energy poverty with palliatives and structural approaches to help formulate solutions to the root causes of energy poverty. In this field, the bridging role of social entrepreneurs between vulnerable groups and politicians could provide new avenues for research in energy poverty with empirical evidence to enable human-centred aspects to be reflected in regulations and legislation in energy and other disciplines.

More research on energy justice and social entrepreneurship may help develop the framing of collective social entrepreneurship on a wide variety of actors, making debates less reductionist. Beyond energy justice and framing, it would be fruitful to explore other ethical

frameworks in future research with a diversity of epistemological approaches and research methods. The line of research of the ethics of care would be particularly relevant for approaches to vulnerability. This study also may guide social entrepreneurs or social innovators as practitioners to minimize energy poverty in developed countries.

In summary, this review leads to the *pre-science* from Corley and Gioia [91] since (i) it pays attention to future emergent domains and complex problems, and (ii) it focuses on improving the relationship and communication between academia and practitioners. Collective social entrepreneurship and innovation may be an alternative, partial, and non-exclusive solution to reduce energy vulnerability.

### **Declarations of interest**

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### **References**

References that appear in the systematic review are signalled with \*

[1] Hiteva, Ralitsa, and Benjamin Sovacool. "Harnessing social innovation for energy justice: A business model perspective." *Energy Policy* 107 (2017): 631-639. <https://doi.org/10.1016/j.enpol.2017.03.056>

[2] Bouzarovski, S., H. Thomson, M. Cornelis, A. Varo, and R. Guyet. "Towards an inclusive energy transition in the European Union: Confronting energy poverty amidst a global crisis." *European Commission: Brussels, Belgium* (2020). <https://doi.org/10.2833/103649>

[3] \* Sovacool, Benjamin K., Dylan Furszyfer Del Rio, and Steve Griffiths. "Contextualizing the Covid-19 pandemic for a carbon-constrained world: Insights for sustainability transitions, energy justice, and research methodology." *Energy Research & Social Science* 68 (2020): 101701. <https://doi.org/10.1016/j.erss.2020.101701>

- [4] Bouzarovski, Stefan. "Understanding energy poverty, vulnerability and justice." In *Energy Poverty*, pp. 9-39. Palgrave Macmillan, Cham, 2018. [https://doi.org/10.1007/978-3-319-69299-9\\_2](https://doi.org/10.1007/978-3-319-69299-9_2)
- [5] \* Boni, Alejandra, Monique Leivas, Teresa De La Fuente, and Sergio Belda-Miquel. "Grassroots Innovation for Human Development: Exploring the Potential of Participatory Video." In *Socio-Economic Development: Concepts, Methodologies, Tools, and Applications*, pp. 687-702. IGI Global, 2019.
- [6] Bouzarovski, Stefan, and Saska Petrova. "A global perspective on domestic energy deprivation: Overcoming the energy poverty–fuel poverty binary." *Energy Research & Social Science* 10 (2015): 31-40. <https://doi.org/10.1016/j.erss.2015.06.007>
- [7] Bouzarovski, Stefan, and Neil Simcock. "Spatializing energy justice." *Energy Policy* 107 (2017): 640-648. <https://doi.org/10.1016/j.enpol.2017.03.064>
- [8] \* Elia, Gianluca, and Alessandro Margherita. "Can we solve wicked problems? A conceptual framework and a collective intelligence system to support problem analysis and solution design for complex social issues." *Technological Forecasting and Social Change* 133 (2018): 279-286. <https://doi.org/10.1016/j.techfore.2018.03.010>
- [9] \* Sovacool, Benjamin K.; Lipson, Matthew M.; Chard, Rose. Temporality, vulnerability, and energy justice in household low carbon innovations. *Energy policy*, 2019, vol. 128, p. 495-504. <https://doi.org/10.1016/j.enpol.2019.01.010>
- [10] Bauwens, Thomas, Benjamin Huybrechts, and Frédéric Dufays. "Understanding the diverse scaling strategies of social enterprises as hybrid organizations: The case of renewable energy cooperatives." *Organization & Environment* 33, no. 2 (2020): 195-219. <https://doi.org/10.1177/1086026619837126>

- [11] Saebi, Tina, Nicolai J. Foss, and Stefan Linder. "Social entrepreneurship research: Past achievements and future promises." *Journal of Management* 45, no. 1 (2019): 70-95. <https://doi.org/10.1177/0149206318793196>
- [12] \* Power, Anne. "Regional politics of an urban age: Can Europe's former industrial cities create a new industrial economy to combat climate change and social unravelling?." *Palgrave Communications* 4, no. 1 (2018): 1-15. <https://doi.org/10.1057/s41599-018-0120-x>
- [13] Sovacool, Benjamin K. What are we doing here? Analyzing fifteen years of energy scholarship and proposing a social science research agenda. *Energy Research & Social Science*, 2014, vol. 1, p. 1-29. <http://dx.doi.org/10.1016/j.erss.2014.02.003>
- [14] \*Martiskainen, Mari; Heiskanen, Eva; Speciale, Giovanna. Community energy initiatives to alleviate fuel poverty: the material politics of Energy Cafés. *Local Environment*, 2018, vol. 23, no 1, p. 20-35. <https://doi.org/10.1080/13549839.2017.1382459>
- [15] Montgomery, A. Wren; Dacin, Peter A.; Dacin, M. Tina. Collective social entrepreneurship: Collaboratively shaping social good. *Journal of Business Ethics*, 2012, vol. 111, no 3, p. 375-388 <https://doi.org/10.1007/s10551-012-1501-5>
- [16] Dacin, M. Tina; Dacin, Peter A.; Tracey, Paul. Social entrepreneurship: A critique and future directions. *Organization science*, 2011, vol. 22, no 5, p. 1203-1213. <http://dx.doi.org/10.1287/orsc.1100.0620>
- [17] \*Jenkins, Kirsten; Sovacool, Benjamin K.; McCauly, Darren. Humanizing sociotechnical transitions through energy justice: An ethical framework for global transformative change. *Energy Policy*, 2018, vol. 117, p. 66-74. <https://doi.org/10.1016/j.enpol.2018.02.036>
- [18] Okhuysen, Gerardo; Bonardi, Jean-Philippe. The challenges of building theory by combining lenses. 2011 <https://doi.org/10.5465/amr.36.1.zok006>

[19] Moulaert, Frank; Maccallum, Diana. *Advanced introduction to social innovation*. Edward Elgar Publishing, 2019.

[20] Webster, Jane, and Richard T. Watson. "Analyzing the past to prepare for the future: Writing a literature review." *MIS quarterly* (2002): xiii-xxiii.

[21] \* Sovacool, Benjamin K., Jonn Axsen, and Steve Sorrell. "Promoting novelty, rigor, and style in energy social science: towards codes of practice for appropriate methods and research design." *Energy Research & Social Science* 45 (2018): 12-42.  
<https://doi.org/10.1016/j.erss.2018.07.007>

[22] Ashoka and Schneider Electric Foundation, Social Innovation to Tackle Energy Poverty | Tackle Energy Poverty, 2019, <https://tackleenergypoverty.ashoka.org/en/program/social-innovation-tackle-energy-poverty> (accessed September 11th, 2021)

[23] Desroches, Gilles Vermot, Patricia Benchenna, Leslie Zambelli, and Agnès Dallemagne. "Resolving Fuel Poverty in Europe: Understanding the Initiatives and Solutions." *Schneider Electric, Technical Paper* (2015),  
[https://www.ashoka.org/sites/default/files/atoms/files/resolving\\_fuel\\_poverty\\_in\\_europe\\_-\\_white\\_paper\\_fse\\_2015.pdf](https://www.ashoka.org/sites/default/files/atoms/files/resolving_fuel_poverty_in_europe_-_white_paper_fse_2015.pdf) (accessed September 11th, 2021).

[24] Day, Rosie, Gordon Walker, and Neil Simcock. "Conceptualising energy use and energy poverty using a capabilities framework." *Energy Policy* 93 (2016): 255-264.  
<https://doi.org/10.1016/j.enpol.2016.03.019>

[25] \*Osunmuyiwa, Olufolahan; Ahlborg, Helene. Inlusiveness by design? Reviewing sustainable electricity access and entrepreneurship from a gender perspective. *Energy Research & Social Science*, 2019, vol. 53, p. 145-158.  
<https://doi.org/10.1016/j.erss.2019.03.010>

- [26] Kyprianou, Ioanna, D. K. Serghides, A. Varo, J. P. Gouveia, D. Kopeva, and L. Murauskaite. "Energy poverty policies and measures in 5 EU countries: A comparative study." *Energy and Buildings* 196 (2019): 46-60. <https://doi.org/10.1016/j.enbuild.2019.05.003>
- [27] Boardman, Brenda. *Fuel poverty: from cold homes to affordable warmth*. Pinter Pub Limited, 1991.
- [28] Hills, John. *Fuel poverty: the problem and its measurement*. 2011.
- [29] Bosch, Jordi, Laia Palència, Davide Malmusi, Marc Mari-Dell'Olmo, and Carme Borrell. "The impact of fuel poverty upon self-reported health status among the low-income population in Europe." *Housing Studies* 34, no. 9 (2019): 1377-1403. <https://doi.org/10.1080/02673037.2019.1577954>
- [30] González-Eguino, Mikel. Energy poverty: An overview. *Renewable and sustainable energy reviews*, 2015, vol. 47, p. 377-385. <https://doi.org/10.1016/j.rser.2015.03.013>
- [31] Dey, Pascal, and Chris Steyaert. "The politics of narrating social entrepreneurship." *Journal of enterprising communities: people and places in the global economy* (2010). <https://doi.org/10.1108/17506201011029528>
- [32] Barrella, Roberto, José Ignacio Linares, José Carlos Romero, Eva Arenas, and Efraim Centeno. "Does cash money solve energy poverty? Assessing the impact of household heating allowances in Spain." *Energy Research & Social Science* 80 (2021): 102216. <https://doi.org/10.1016/j.erss.2021.102216>
- [33] Gupta, Parul, Sumedha Chauhan, Justin Paul, and Mahadeo P. Jaiswal. "Social entrepreneurship research: A review and future research agenda." *Journal of Business Research* 113 (2020): 209-229. <https://doi.org/10.1016/j.jbusres.2020.03.032>

- [34] Mair, Johanna; Marti, Ignasi. Social entrepreneurship research: A source of explanation, prediction, and delight. *Journal of world business*, 2006, vol. 41, no 1, p. 36-44. <https://doi.org/10.1016/j.jwb.2005.09.002>
- [35] Bornstein, David. *How to change the world: Social entrepreneurs and the power of new ideas*. Oxford University Press, 2007.
- [36] Short, Jeremy C., Todd W. Moss, and G. Tom Lumpkin. "Research in social entrepreneurship: Past contributions and future opportunities." *Strategic entrepreneurship journal* 3, no. 2 (2009): 161-194. <https://doi.org/10.1002/sej.69>.
- [37] Nordstrom, Onnolee Anne, and Jennifer E. Jennings. "Charting the collective interest in collective entrepreneurship: An integrative review." *Academy of Management Proceedings*. Vol. 2015. No. 1. Briarcliff Manor, NY 10510: Academy of Management, 2015. <https://doi.org/10.5465/ambpp.2015.140>
- [38] Peredo, Ana Maria, and James J. Chrisman. "Toward a theory of community-based enterprise." *Academy of management Review* 31, no. 2 (2006): 309-328. <https://doi.org/10.5465/amr.2006.20208683>
- [39] Nicholls, Alex, and Simon Teasdale. "Neoliberalism by stealth? Exploring continuity and change within the UK social enterprise policy paradigm." *Policy & Politics* 45, no. 3 (2017): 323-341. <https://doi.org/10.1332/030557316X14775864546490>.
- [40] Nandan, Monica, Manuel London, and Tricia Bent-Goodley. "Social workers as social change agents: Social innovation, social intrapreneurship, and social entrepreneurship." *Human Service Organizations: Management, Leadership & Governance* 39.1 (2015): 38-56. <https://doi.org/10.1080/23303131.2014.955236>

- [41] Manjon, Maria-Jose, Amparo Merino, and Iain Cairns. "Tackling energy poverty through social intrapreneurship in large-scale energy companies." *Social Enterprise Journal* (2021) <https://doi.org/10.1108/SEJ-11-2020-0103>
- [42] Dawson, Patrick, and Lisa Daniel. "Understanding social innovation: a provisional framework." *International Journal of Technology Management* 51.1 (2010): 9-21. <http://dx.doi.org/10.1504/IJTM.2010.033125>
- [43] Geels, Frank W. Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case-study. *Research policy*, 2002, vol. 31, no 8-9, p. 1257-1274. [https://doi.org/10.1016/S0048-7333\(02\)00062-8](https://doi.org/10.1016/S0048-7333(02)00062-8)
- [44] Smith, Adrian. Translating sustainabilities between green niches and socio-technical regimes. *Technology analysis & strategic management*, 2007, vol. 19, no 4, p. 427-450. <https://doi.org/10.1080/09537320701403334>.
- [45] Okoli, Chitu. A guide to conducting a standalone systematic literature review. *Communications of the Association for Information Systems*, 2015, vol. 37, no 1, p. 43. <https://doi.org/10.17705/1CAIS.03743>
- [46] \* Silvestre, Bruno S., and Diana Mihaela Țîrcă. "Innovations for sustainable development: Moving toward a sustainable future." *Journal of Cleaner Production* 208 (2019): 325-332. <https://doi.org/10.1016/j.jclepro.2018.09.244> 0959-6526
- [47] Wannags, Laura; Gold, Stefan. Assessing tensions in corporate sustainability transition: From a review of the literature towards an actor-oriented management approach. *Journal of Cleaner Production*, 2020, p. 121662. <https://doi.org/10.1016/j.jclepro.2020.121662>

- [48] Macinnis, Deborah J. A framework for conceptual contributions in marketing. *Journal of Marketing*, 2011, vol. 75, no 4, p. 136-154. <https://doi.org/10.1509/jmkg.75.4.136>
- [49] Guyet, Rachel, Lidija Živčić, Ana Stojilovska, Marilyn Smith, Ana Horta, and Katrin Grossmann. "Energy poverty policies: reviewing the policy design." *European Energy Poverty Agenda Co-Creation and Knowledge Innovation (ENGAGER 2017-2021)* (2018), accessed September 10th, 2021.
- [50] \*Kalt, Gerald, Dominik Wiedenhofer, Christoph Görg, and Helmut Haberl. "Conceptualizing energy services: A review of energy and well-being along the Energy Service Cascade." *Energy Research & Social Science* 53 (2019): 47-58. <https://doi.org/10.1016/j.erss.2019.02.026>
- [51] \* McCauley, Darren, Vasna Ramasar, Raphael J. Heffron, Benjamin K. Sovacool, Desta Mebratu, and Luis Mundaca. "Energy justice in the transition to low carbon energy systems: Exploring key themes in interdisciplinary research." (2019): 916-921. <https://doi.org/10.1016/j.apenergy.2018.10.005>
- [52] \* Boerenfijn, P., J. K. Kazak, L. Schellen, and Joost Van Hoof. "A multi-case study of innovations in energy performance of social housing for older adults in the Netherlands." *Energy and Buildings* 158 (2018): 1762-1769. <https://doi.org/10.1016/j.enbuild.2017.10.101>
- [53] \* Pitt, Joe, and Colin Nolden. "Post-Subsidy Solar PV Business Models to Tackle Fuel Poverty in Multi-Occupancy Social Housing." *Energies* 13, no. 18 (2020): 4852. <https://doi.org/10.3390/en13184852>.
- [54] \* Dineen, D., F. Rogan, and BP Ó. Gallachóir. "Improved modelling of thermal energy savings potential in the existing residential stock using a newly available data source." *Energy* 90 (2015): 759-767. <https://doi.org/10.1016/j.energy.2015.07.105>

- [55] \* Santamouris, Mat. "Innovating to zero the building sector in Europe: Minimising the energy consumption, eradication of the energy poverty and mitigating the local climate change." *Solar Energy* 128 (2016): 61-94.<https://doi.org/10.1016/j.solener.2016.01.021>
- [56] \* Sdei, Arianna, François Gloriant, Pierre Tittlein, Stéphane Lassue, Paul Hanna, Christophe Beslay, Romain Gournet, and Mike McEvoy. "Social housing retrofit strategies in England and France: a parametric and behavioural analysis." *Energy Research & Social Science* 10 (2015): 62-71. <https://doi.org/10.1016/j.erss.2015.07.001>
- [57] \* Bale, Catherine SE, Nicholas J. McCullen, Timothy J. Foxon, Alastair M. Rucklidge, and William F. Gale. "Harnessing social networks for promoting adoption of energy technologies in the domestic sector." *Energy Policy* 63 (2013): 833-844. <http://dx.doi.org/10.1016/j.enpol.2013.09.033i>
- [58] \* Campos, Inês, and Esther Marín-González. "People in transitions: Energy citizenship, prosumerism and social movements in Europe." *Energy Research & Social Science* 69 (2020): 101718.<https://doi.org/10.1016/j.erss.2020.101718>
- [59] \*Picciotti, Antonio. "Towards sustainability: The innovation paths of social enterprise." *Annals of Public and Cooperative Economics* 88, no. 2 (2017): 233-256. <https://doi.org/10.1111/apce.12168>
- [60] \* Patkós, Csaba, Zsolt Radics, József Barnabás Tóth, Enikő Kovács, Péter Csorba, István Fazekas, György Szabó, and Tamás Tóth. "Climate and energy governance perspectives from a municipal point of view in Hungary." *Climate* 7, no. 8 (2019): 97. <https://doi.org/10.3390/cli7080097>
- [61] \* Fu, Miao, J. Andrew Kelly, and J. Peter Clinch. "Residential solid fuel use: Modelling the impacts and policy implications of natural resource access, temperature, income, gas infrastructure and government regulation." *Applied geography* 52 (2014): 1-13.

- [62] Czarniawska, Barbara, ed. A narrative approach to organisation studies. Sage Publications, (1997) <https://dx.doi.org/10.4135/9781412983235>
- [63] \*Nunes, Ana Raquel. "The contribution of assets to adaptation to extreme temperatures among older adults." *PloS one* 13, no. 11 (2018): e0208121. <https://doi.org/10.1371/journal.pone.0208121>
- [64] Yanow, Dvora. Conducting interpretive policy analysis. Vol. 47. Sage, 2000.
- [65] \* Streimikiene, Dalia, and Tomas Balezentis. "Innovative policy schemes to promote renovation of multi-flat residential buildings and address the problems of energy poverty of aging societies in former socialist countries." *Sustainability* 11, no. 7 (2019): 2015. <https://doi.org/10.3390/su11072015>
- [66] \*Jenkins, Kirsten EH, Shannon Spruit, Christine Milchram, Johanna Höffken, and Behnam Taebi. "Synthesizing value sensitive design, responsible research and innovation, and energy justice: A conceptual review." *Energy Research & Social Science* 69 (2020): 101727. <https://doi.org/10.1016/j.erss.2020.101727>
- [67] Sovacool, Benjamin K., Matthew Burke, Lucy Baker, Chaitanya Kumar Kotikalapudi, and Holle Wlokas. "New frontiers and conceptual frameworks for energy justice." *Energy Policy* 105 (2017): 677-691. <https://doi.org/10.1016/j.enpol.2017.03.005>
- [68] \* O'Brien, Geoff, and Alex Hope. "Localism and energy: Negotiating approaches to embedding resilience in energy systems." *Energy policy* 38, no. 12 (2010): 7550-7558. <https://doi.org/10.1016/j.enpol.2010.03.033>
- [69] Seyfang, Gill, and Adrian Smith. "Grassroots innovations for sustainable development: Towards a new research and policy agenda." *Environmental politics* 16, no. 4 (2007): 584-603. <https://doi.org/10.1080/09644010701419121>

- [70] \* Okkonen, Lasse, and Olli Lehtonen. "Socio-economic impacts of community wind power projects in Northern Scotland." *Renewable Energy* 85 (2016): 826-833. <https://doi.org/10.1016/j.renene.2015.07.047>
- [71] \* Sovacool, Benjamin K., and Ishani Mukherjee. "Conceptualizing and measuring energy security: A synthesized approach." *Energy* 36, no. 8 (2011): 5343-5355. <https://doi.org/10.1016/j.energy.2011.06.043>
- [72] \* Butler, Danielle, and Graeme Sherriff. "'It's normal to have damp': Using a qualitative psychological approach to analyse the lived experience of energy vulnerability among young adult households." *Indoor and Built Environment* 26, no. 7 (2017): 964-979. <https://doi.org/10.1177/1420326X17708018>
- [73] \* Streimikiene, Dalia; Balezentis, Tomas. Willingness to Pay for Renovation of Multi-Flat Buildings and to Share the Costs of Renovation. *Energies*, 2020, vol. 13, no 11, p. 2721. <https://doi.org/10.3390/en13112721>
- [74] \*Schaffrin, André; Reibling, Nadine. Household energy and climate mitigation policies: Investigating energy practices in the housing sector. *Energy Policy*, 2015, vol. 77, p. 1-10. <https://doi.org/10.1016/j.enpol.2014.12.002>
- [75] \*Sahakian, Marlyne; Dobigny, Laure. From governing behaviour to transformative change: A typology of household energy initiatives in Switzerland. *Energy Policy*, 2019, vol. 129, p. 1261-1270.
- [76] \* Yousif, Charles, Damien Gatt, and Cedric Caruana. "Building energy renovation and smart integration of renewables in a social housing block toward nearly-zero energy status." *Frontiers in Energy Research* (2020): 243. <https://doi.org/10.3389/fenrg.2020.560892>
- [77] \*Knuth, Sarah. Cities and planetary repair: The problem with climate retrofitting. *Environment and Planning A: Economy and Space*, 2019, vol. 51, no 2, p. 487-504. <https://doi.org/10.1177/0308518X18793973>

- [78] \* Claude, Sophie, Stéphane Ginestet, Marion Bonhomme, Nicolas Moulène, and Gilles Escadeillas. "The Living Lab methodology for complex environments: Insights from the thermal refurbishment of a historical district in the city of Cahors, France." *Energy Research & Social Science* 32 (2017): 121-130. <https://doi.org/10.1016/j.culher.2018.04.017>
- [79] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, "A Renovation Wave for Europe - greening our buildings, creating jobs, improving lives", 2020. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0662> (accessed September 14th 2021)
- [80] Catrin, Maby, European Federation of National Organisations Working with the Homeless (Feantsa), "Renovation: Staying on top of the wave; Avoiding social risks and ensuring the benefits", 2020. [https://www.feantsa.org/public/user/Resources/reports/Renovation\\_Wave\\_final\\_report.pdf](https://www.feantsa.org/public/user/Resources/reports/Renovation_Wave_final_report.pdf)
- [81] \* Webb, Janette. Improvising innovation in UK urban district heating: The convergence of social and environmental agendas in Aberdeen. *Energy policy*, 2015, vol. 78, p. 265-272. <https://doi.org/10.1016/j.enpol.2014.12.003>
- [82] \*Brugmann, Jeb, and Coimbatore K. Prahalad. "Cocreating business's new social compact." *Harvard business review* 85, no. 2 (2007): 80.
- [83] \*Mechlenborg, Mette; Gram-Hanssen, Kirsten. Gendered homes in theories of practice: A framework for research in residential energy consumption. *Energy Research & Social Science*, 2020, vol. 67, p. 101538. <https://doi.org/10.1016/j.erss.2020.101538>
- [84] \* Costello, Anthony, Mark Maslin, Hugh Montgomery, Anne M. Johnson, and Paul Ekins. "Global health and climate change: moving from denial and catastrophic fatalism to positive action." *Philosophical Transactions of the Royal Society A: Mathematical, Physical and*

*Engineering Sciences* 369, no. 1942 (2011): 1866-1882.

<https://doi.org/10.1098/rsta.2011.0007>

[85] \* Carley, Sanya, and David M. Konisky. "The justice and equity implications of the clean energy transition." *Nature Energy* 5, no. 8 (2020): 569-577. <https://doi.org/10.1038/s41560-020-0641-6>

[86] \*Imaz, Mariana; Sheinbaum, Claudia. Science and technology in the framework of the sustainable development goals. *World Journal of Science, Technology and Sustainable Development*, 2017. <https://doi.org/10.1108/WJSTSD-04-2016-0030>

[87] \* Dandara-Tabacaru, Daniela, and Marius Ioan Danila. "Financial system stability and social welfare." *Revista de Cercetare si Interventie Sociala* 56 (2017): 153.

[88] \* Karlsson, Rasmus. Après Paris: breakthrough innovation as the primary moral obligation of rich countries. *Environmental Science & Policy*, 2016, vol. 63, p. 170-176. <https://doi.org/10.1016/j.envsci.2016.05.023>

[89] \* Longo, Danila, Giulia Olivieri, Rossella Roversi, Giulia Turci, and Beatrice Turillazzi. "Energy Poverty and Protection of Vulnerable Consumers. Overview of the EU Funding Programs FP7 and H2020 and Future Trends in Horizon Europe." *Energies* 13, no. 5 (2020): 1030. <https://doi.org/10.3390/en13051030>

[90] \* Belaïd, Fateh, Adel Ben Youssef, and Nathalie Lazaric. "Scrutinizing the direct rebound effect for French households using quantile regression and data from an original survey." *Ecological Economics* 176 (2020): 106755. <https://doi.org/10.1016/j.ecolecon.2020.106755>

[91] Corley, Kevin G., and Dennis A. Gioia. "Building theory about theory building: what constitutes a theoretical contribution?." *Academy of management review* 36, no. 1 (2011): 12-32. <https://doi.org/10.5465/amr.2009.0486>

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