



# Editorial: Urban Energy Poverty and Positive Energy Districts

Siddharth Sareen<sup>1\*</sup>, Caitlin Robinson<sup>2</sup>, Harriet Thomson<sup>3</sup> and Rigoberto García Ochoa<sup>4</sup>

<sup>1</sup> Department of Media and Social Sciences, University of Stavanger, Stavanger, Norway, <sup>2</sup> Department of Geography and Planning, University of Liverpool, Liverpool, United Kingdom, <sup>3</sup> Department of Social Policy, Sociology and Criminology, University of Birmingham, Birmingham, United Kingdom, <sup>4</sup> El Colegio de la Frontera Norte, Tijuana, Mexico

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## Editorial on the Research Topic

### Urban Energy Poverty and Positive Energy Districts

Cities are important actors in low-carbon energy transitions. They matter as front-runners, trend-setters and decision-makers. They matter as daily settings for over half of humanity. As cities continue to evolve, urban form is changing and the effects on consumption and climate change are the focus of political debate, governance and urban transformation research. Yet, without careful planning and thought, changing cities can have profound negative impacts on social inclusion. These impacts are felt most acutely by disadvantaged groups such as the urban energy poor. Shifts to positive energy districts (PEDs) and low-carbon urban forms can lead to green gentrification and exacerbate intersecting inequalities, or they can be drivers of inclusive cities that become low-carbon and socially sustainable.

This thematic collection focuses on the contested, varied and dynamic relationship between urban energy poverty and PEDs, which the Joint Programming Initiative Urban Europe defines as “an urban neighbourhood with annual net zero energy import and net zero CO<sub>2</sub> emissions working towards a surplus production of renewable energy, integrated in an urban and regional energy system<sup>1</sup>” The former refers to a lack of access to essential domestic energy services in cities, while the latter highlights the multi-scalar spaces and places of sustainability interventions in urban infrastructure. We feature contributions from a wide range of urban contexts, social science disciplines and novel interdisciplinary methodological approaches that address three cross-cutting thematic domains and suggest a need to include a focus on equity and justice in policy on PEDs.

First, the collection strikes a balance between locally situated understandings of energy vulnerabilities and attention to how these are and can be assessed and addressed. On the one hand, contributions unpack aspects such as territorial vulnerability, deprivation, inequity, insecurity, gendered differences, cultural preferences and practises in relation to richly contextualised perspectives on changing energy systems during low-carbon transitions (Calvo et al.; Boza-Kiss et al.; Cravioto and Mosqueda; Reid and Simatele; Pereira et al.). On the other hand, contributions

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### Edited and reviewed by:

Stefan Bouzarovski,  
The University of Manchester,  
United Kingdom

### \*Correspondence:

Siddharth Sareen  
siddharth.sareen@uis.no

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<sup>1</sup>See <https://jpi-urbaneurope.eu/ped/>

delve into the ways in which energy poverty is and can be assessed and addressed at the district scale in relation to low-carbon energy transitions, spanning approaches such as historic district retrofitting and renovation, behavioural change interventions, community scale renewable energy, housing and energy sector intersections and regional scale initiatives (Gouveia et al.; Caballero and Della Valle; Nordholm and Sareen; Antepara; Crowther et al.). Together, this array of contributions constitutes a substantive basis to grasp the multi-dimensional nature of energy vulnerabilities at stake and the multiple pathways and synergies possible in order to attend to them during low-carbon transitions. It also highlights the risks that should be considered in order to avoid exacerbating existing inequalities, or producing new ones, during ongoing systemic changes in energy and related sectors at the district scale.

Second, a number of the contributions advance our understanding and appreciation of the relationship between socio-economic and low-carbon indicators at urban and sub-urban scales. Some foreground perspectives of situated actors; e.g., city regions in England working to shape customised pathways and infrastructures for just transitions (Crowther et al.), social housing providers in Spain grappling with carbon markets and building energy consumption (Antepara), and government initiatives in Portugal aimed at enabling broader social inclusion through community scale solar energy plants (Nordholm and Sareen). Others mobilise comparisons across urban contexts broadly understood (Boza-Kiss et al.), within the same country using Chile (Calvo et al.) and Mexico as apt cases, in a global region such as Southern Africa (Reid and Simatele) and across multiple countries in Latin America (Pereira et al.). The upshot is a convincing demonstration of how complex it is to ensure a socially equitable, cross-sectoral move to low-carbon energy systems in ways that recognise and enrol the diverse needs and perspectives of district-level stakeholders. Yet it becomes clear that this challenge is a shared one, with ample scope for knowledge sharing and cross-fertilisation of approaches and indicators as initiatives are metricised, and existing metrics adapted to new infrastructures.

Third, the global span of the collection underscores the varieties of urban energy transitions that are underway, from retrofitting the built environment as explored in Mexico (Craviato and Mosqueda 2021) to intervening in localised energy practises at the sub-urban scale as unpacked in the case of Italy (Caballero and Della Valle). Equally importantly, the contributions reveal how the impact of such transitions extends well beyond the formal changes targeted through plans, to reshape numerous informal aspects of urban life. The implications are especially significant for disadvantaged population groups, as evident in the insights on energy deprivation and inequities during the pandemic (Boza-Kiss et al.), and through reflections on energy insecurity in the urban livelihoods of female informal workers (Reid and Simatele). Thus, low-carbon energy transformations not only raise a variegated set of social inclusion concerns; planned changes require a novel range of hybrid metrics and measures to assess and address impacts that transcend narrow conceptualisations of transition. As shown in a cross-country

analysis (Pereira et al.) and even within complex domestic geographies (Crowther et al.; Calvo et al.) and sub-urban particularities (Gouveia et al.), the national variance and context-specificity of energy poverty drivers limits the value of narrow national parameters to address informal aspects at lower scales. Thus, district and urban scale actors have key roles to play to enable and mobilise hybrid energy poverty metrics and alleviation measures aligned with low-carbon energy transitions.

In closing, we reflect on the relative paucity of energy poverty research that engages directly with PEDs as an object of policy. This is attributable to PEDs mainly being driven from Europe as the only global region with a specific target of realising 100 PEDs by 2025. Yet even among the five contributions that deal with European countries, most engage only tangentially with PEDs as a specific set of infrastructural interventions. A risk we foresee here is that energy poverty considerations will not sufficiently inform this critical low-carbon energy transition ongoing at sub-urban scales in a timely manner. It follows from our synthesis points above that a failure to integrate the two research agendas will result in the sub-optimal customisation of PEDs to socially situated experiences of energy poverty, informed by metrics and impact assessments that inadequately capture the full range of socio-economic concerns, both formal and informal, in all their complexity, nuance and geographical specificities. Consequently, we call for future research on energy poverty to engage closely with PEDs, and vice versa, in order to shape real-world practise beyond European contexts.

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SS led the writing. All authors contributed to the article and approved the submitted version.

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