



OPEN ACCESS

EDITED AND REVIEWED BY

Faik Bilgili,
Erciyes University, Türkiye

*CORRESPONDENCE

Maria Alzira Pimenta Dinis,
✉ madinis@ufp.edu.pt

RECEIVED 17 November 2023

ACCEPTED 08 December 2023

PUBLISHED 18 December 2023

CITATION

Dinis MAP, Ngarava S, Zhou L and Chari MM (2023), Editorial: Sustainability challenges around energy poverty in an era of global environmental and economic crisis.

Front. Environ. Sci. 11:1340083.

doi: 10.3389/fenvs.2023.1340083

COPYRIGHT

© 2023 Dinis, Ngarava, Zhou and Chari. This is an open-access article distributed under the terms of the [Creative Commons Attribution License \(CC BY\)](#). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

Editorial: Sustainability challenges around energy poverty in an era of global environmental and economic crisis

Maria Alzira Pimenta Dinis ^{1,2*}, Saul Ngarava ³, Leocadia Zhou ⁴ and Martin Munashe Chari ⁴

¹UFP Energy, Environment and Health Research Unit (FP-ENAS), Faculty of Science and Technology, University Fernando Pessoa, Porto, Portugal, ²Fernando Pessoa Research, Innovation and Development Institute (FP-IEDI), University Fernando Pessoa (UFP), Porto, Portugal, ³Copernicus Institute of Sustainable Development, Utrecht, Netherlands, ⁴Risk and Vulnerability Science Centre (RVSC), University of Fort Hare, Alice, South Africa

KEYWORDS

environmental crisis, economic uncertainty, sustainability, sustainable development goals (SDGs), emerging trends, energy policy, energy efficiency, energy security

Editorial on the Research Topic

[Sustainability challenges around energy poverty in an era of global environmental and economic crisis](#)

Energy is crucial at the industrial and domestic levels. Access to affordable energy must be a priority on the governmental agenda, specifically at times of environmental crisis and economic uncertainty (Walter et al., 2022). Lack of access to affordable energy pushes citizens towards energy poverty (Walter et al., 2022). The significance of this Research Topic was highlighted when United Nations (UN) Sustainable Development Goals (SDGs) addressed it in SDG 7 (United Nations, 2023). As energy is crucial for economic development and wellbeing, the UN calls for urgent energy action to address energy poverty and energy access to advance the SDGs (United Nations, 2023). Healthcare, education, access to essential commodities, services, and information, as well as opportunities for work and creative activities, all require affordable and reliable energy services. Thus, SDG7 is strongly interlinked to SDG1 (United Nations, 2023), which is focused on poverty eradication. According to the UN (United Nations, 2021), the pandemic is also obstructing the progress towards SDG 7 and SDG 1. Extreme poverty and energy poverty are disproportionately associated with hindered development in regions and populations, and the two are inextricably intertwined. It is recognized that energy poverty is widespread throughout the world, but it is especially prominent in developing countries (Walter et al., 2022), with limited research being available in this respect. In order to accurately measure and assess energy poverty, it becomes necessary to distinguish between low energy supply and home service shortages. The current target SDG7.1 (United Nations n.d.-d) indicators, 7.1.1 (Proportion of population with access to electricity) and 7.1.2 (Proportion of population with primary reliance on clean fuels and technology) are clearly not enough, contributing to an underestimation of the difficulties of ending energy poverty. The numerous dimensions of poverty, including energy poverty, need to be further addressed in order to create resilience and improve wellbeing (Walter et al., 2022).

Within energy poverty, the issues involve energy policy, efficiency, security, transition, and action.

The linkages to be addressed involve both environmental and social dimensions that need to be assessed. The approach to be pursued will demand a variety of methodologies contributing to the analysis of this global, yet so specific, topic. The solutions must consider broader sustainability challenges at the global level, comprising environmental, economic, and sociodimensional resilience, improving policy coherence to increase the focus of energy access policy. Policymakers, stakeholders, and civil society all need to make a worldwide commitment to improve social cohesion by adopting common goals (Batool et al., 2022; Batool et al., 2023; Chen et al., 2023; Khalid et al., 2023; Walter et al., 2023; Walter et al. 2023; Walter et al. 2023).

Exploring contributions to energy poverty and interconnections with climate policy, pandemics, sustainable patterns, and socioeconomic inequality in the broader context of sustainability concerns, research needs to move on towards combined efforts to further advance energy poverty challenges from a variety of views, translated by the publications incorporating this Research Topic, listed below, advancing knowledge in this topical area.

Notwithstanding low rates of local energy access, Africa in particular is regarded as a key player in the global energy transition due to its abundant supply of fossil fuels and an extensive reserve of essential minerals needed for producing components used in renewable energy systems within the energy industry, as well as storage devices in the transportation and electronics fields, as highlighted by Nsafon et al. These authors investigated the policy implications of the just transition guaranteeing efforts guiding Africa toward a lower-carbon future are backed by fair, equitable, and just considerations, concluding that a gradual transition focused on low-carbon growth is the most promising and practical method to transforming the region's economy and addressing climate change.

As China's economy has developed, energy industry also evolved. Luo and Chen have analyzed the impact of sports industry agglomeration in the high-quality of green energy. Their study has allowed to understand that China's green energy development level is slowly improving, while creating disparities due to major regional variances. The eastern and central regions have equal levels of development, but the western region has a comparatively low level. Improving sports industry agglomeration can boost high-quality regional green energy development, progressively transforming the living environment, lifestyle, and consumption patterns of residents, as encouraging regional green technology investment and changes the energy consumption.

The study of Gölitzer et al. addresses the need for energy-saving in German society due to rising energy prices and climate change concerns. It explores the potential of using motivational stickers and posters to increase stair usage in a university setting, benefiting both energy conservation and promoting physical activity. After the intervention, elevator usage decreased by approximately 7%, with nearly a fifth of participants feeling motivated to choose stairs. Gender differences in stair usage diminished, and individuals were more likely to use stairs than in groups. The intervention's success suggests its application at a population level to save energy and improve human fitness through reduced elevator usage.

Ensuring sustainable development in China requires a delicate balance between forest resources and economic growth. Examining Inner Mongolia's unique context, the study of Wu et al. explores the impact of economic growth on its forest resources from 1980 to 2018. Employing an Environmental Kuznets Curve (EKC) model, results reveal an inverted N-shaped EKC relationship, indicating a "decline-up-decline" pattern in forest coverage and a "decline-up" evolution in forest stock volume, with current growth projections. Population density minimally affects the forest coverage rate. The government should invest in technology and funds, prioritize young and middle-aged forest growth, and ensure overall ecosystem health. Industrial structural upgrade is crucial to balance economic growth and forest conservation. Reducing the secondary industry's proportion while promoting the tertiary industry and fostering forest-related sectors like tourism becomes vital for sustainable forest resource management.

The above mentioned four articles rely upon different methodologies to assess various aspects involved in sustainability challenges at the global level, advancing the knowledge towards the proposed initial call involving Broad Sustainability Challenges. All contributions are clear in highlighting the role played by proper resource management, and thus energy, in every scope assessed, demonstrating how urgent it is to advance sustainable development in this context to strengthen cohesion at a worldwide level.

Author contributions

MD: Conceptualization, Methodology, Writing—original draft, Writing—review and editing. SN: Writing—review and editing. LZ: Writing—review and editing. MC: Writing—review and editing.

Funding

The author(s) declare that no financial support was received for the research, authorship, and/or publication of this article.

Acknowledgments

MAPD would like to thank to UFP Energy, Environment and Health Research Unit (FP-ENAS), and Fernando Pessoa Research, Innovation and Development Institute (FP-I3ID), both from University Fernando Pessoa (UFP), Porto, Portugal.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

The author(s) declared that they were an editorial board member of *Frontiers*, at the time of submission. This had no impact on the peer review process and the final decision.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated

organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

References

- Batool, K., Zhao, Z.-Yu, and Atif, A. D. (2022). Nexus between energy poverty and innovations: a pathway for addressing energy sustainability. *Front. Environ. Sci.* 10. doi:10.3389/fenvs.2022.888080
- Batool, K., Zhao, Z.-Yu, Irfan, M., and Zywolek, J. (2023). Assessing the role of sustainable strategies in alleviating energy poverty: an environmental sustainability paradigm. *Environ. Sci. Pollut. Res.* 30 (25), 67109–67130. doi:10.1007/s11356-023-27076-0
- Chen, H., Gao, Ke, Tian, S., Sun, R., Cui, K., and Zhang, Y. (2023). Nexus between energy poverty and sustainable energy technologies: a roadmap towards environmental sustainability. *Sustain. Energy Technol. Assessments* 56. doi:10.1016/j.seta.2022.102949
- Khalid, F., Yi, K., Akram, R., and Batool, K. (2023). *Linking corporate social responsibility and energy poverty: an environmental sustainability paradigm*. Unites States: Energy and Environment. Available at: <https://www.scimagojr.com/journalsearch.php?q=29360&tip=sid&clean=0>. doi:10.1177/0958305x231169009
- Sustainable Development Goals (2023). *SDG indicators*. <https://unstats.un.org/sdgs/metadata/?Text=&Goal=7&Target=> (Accessed June 25, 2023).
- United Nations (2021). *SDG7 TAG policy Briefs: Leveraging energy action for advancing the sustainable development goals*. Available at: <https://sdgs.un.org/publications/report-2021-sdg7-tag-policy-briefs-leveraging-energy-action-advancing-sustainable>.
- United Nations (2023a). *End poverty in all its forms everywhere*. Available at: <https://sdgs.un.org/goals/goal1> (Accessed June 25, 2023).
- United Nations (2023b). *Energy*. Available at: <https://sdgs.un.org/topics/energy> (Accessed June 25, 2023).
- United Nations (2023c). *Ensure access to affordable, reliable, sustainable and modern energy for all*. Available at: <https://sdgs.un.org/goals/goal7> (Accessed June 25, 2023).
- Walter, L. F., Aina, Y., Pimenta Dinis, M. A., Purcell, W., and Nagy, G. J. (2023a). Climate change: why higher education matters? *Sci. Total Environ.* 892. doi:10.1016/j.scitotenv.2023.164819
- Walter, L. F., Ozuyar, P. G., Pimenta Dinis, M. A., Azul, A. M., Garcia Alvarez, M., Neiva, S. S., et al. (2023b). "Living labs in the context of the UN sustainable development goals: state of the art," in *Sustainability Science 18* (Japan: Sustainability Science Innovation and Capacity Development), 1163–1179. Available at: <https://www.scimagojr.com/journalsearch.php?q=5400152621&tip=sid&clean=0>. doi:10.1007/s11625-022-01240-w
- Walter, L. F., Paulino Pires Eustachio, J. H., Pimenta Dinis, M. A., Sharifi, A., Venkatesan, M., Kwabena Donkor, F., et al. (2022b). Transient poverty in a sustainable development context. *Int. J. Sustain. Dev. World Ecol.* 29 (5), 415–428. doi:10.1080/13504509.2022.2029612
- Walter, L. F., Pimenta Dinis, M. A., Ruiz-de-Maya, S., Doni, F., Eustachio, J. H., Swart, J., et al. (2022a). The Economics of the UN Sustainable Development Goals: does sustainability make financial sense? *Discov. Sustain.* 3, 1–8. doi:10.1007/s43621-022-00088-5
- Walter, L. F., Vidal, D. G., Pimenta Dinis, M. A., Lambrechts, W., Portela Vasconcelos, C. R., Molthan-Hill, P., et al. (2023c). Low carbon futures: assessing the status of decarbonisation efforts at universities within a 2050 perspective. *Energy, Sustain. Soc.* 13. doi:10.1186/s13705-023-00384-6