WHY SHOULD WE STOP SEEKING ENERGY SAVINGS IN SUMMER ENERGY POVERTY POLICIES? HEALTH AND THERMAL COMFORT MATTER

Credits

Editor: Universidad Politénica de Madrid
Status Version: Final version
Distribuition level: Public
Approved by: Asociación Bienestar y Desarrollo, Ecoserveis, AISFOR SRL, Municipality of Parma, CSEG, Municipality of Peshtera, Villabs.

Project number: 101032823
Project title: Cooltorise. Raising summer energy poverty awareness to reduce cooling needs.

Please cite as

Sanz Fernandez, A., Sánchez-Guevara Sánchez, C., Ferrer i Gabarró, C., García París, M., Karamitreva, G., Kyrkou, D.,; Simeonov, G.,; Zimelli, D. (2024). Why should we stop seeking energy savings in summer energy poverty policies? Health and thermal comfort matter. Universidad Politécnica de Madrid.

Acknowledgements

The present policy brief was developed in the context of the COOLTORISE project: Raising summer energy poverty awareness to reduce cooling needs, in collaboration with the following EU funded projects working on tackling energy poverty from different perspectives:

WELLBASED: H2020 project to design and implement urban programs to alleviate energy poverty and assess its impact on health (https://wellbased.eu/). WELLBASED has been funded by the European Union's Horizon 2020 Programme under the Grant Agreement GA 945097.

EMPOWERMED: Empowering women to take action against energy poverty (https://www.empowermed.eu/). Funded by European Union's Horizon 2020 Programme un der the Grant Agreement No 847052.

Cooltorise

https://cooltorise.eu/

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant agreement No 101032823.

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Introduction

While the existing literature on energy poverty is predominantly focused on cold climates until a few years ago, efforts in the last five years have begun to address summer energy poverty and heat issues, as seen in the EPAH indicators[1]. Nonetheless, a more detailed approach is needed, as the gap between the analysis of winter energy poverty and summer energy poverty remains significant. This disparity reflects a historical tendency to prioritize winter energy poverty. Such a focus has been influenced by the EU's policies and resource allocation, traditionally centered on the needs of colder regions. In contrast, regions with warmer climates, such as the Mediterranean, have had less political and economic influence in shaping the energy poverty discourse and policy agendas.

Given the prevalence of the summer energy poverty phenomenon in Mediterranean countries over the rest of the EU, previous work[2] has already introduced a Mediterranean-specific perspective when designing mitigating policies. Building and urban climatic conditions, cooling systems availability, socio-economic conditions, and climate change are all contributing factors to tipping the scales towards a higher summer energy poverty incidence in the households of the Mediterranean coastal strip.

In addition, it is also known that climate change-induced extreme weather conditions, such as heat waves, are becoming a more frequent occurrence. Various reports and studies, e.g. those developed by the Intergovernmental Panel on Climate Change (IPCC[3]), warn that extreme events are predicted to have an important impact on public health. In cities and dense urban areas, the burden of said weather events will be compounded by the Urban Heat Island (UHI) effect, which will aggravate extreme temperatures in city centres.

It is foreseeable that in the coming years, numerous projects, studies, and policies will address the challenge of adapting the population to episodes of extreme summer temperatures. These endeavours will seek to minimize impacts and mitigate effects, with a particular focus on the vulnerable population that faces more difficulties in adjusting to these temperature increases. For that purpose, there is a need to have a solid assessment of the impact of extreme summer temperatures on vulnerable people, yet to be fully conducted.

Objective of the present policy brief

Based on the experience and accumulated knowledge from the development of the projects contributing to this policy brief, this document provides a brief review of what we currently know about comfort and consumption conditions in homes experiencing energy poverty during the summer. While other energy and housing projects typically evaluate their results by focusing on energy savings, projects aimed at reducing energy poverty require a different evaluation approach. This new perspective would value not only consumption reduction but also the improvement in households' overall well-being. Evidence-based recommendations are established on how the final impact of policies and "expected impact" from funded projects should be implemented for the correct adaptation policies for the population in energy poverty.

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[1]Energy Poverty Advisory Hub. (2023). Energy Poverty Advisory Hub (EPAH) Handbook 1: A Guide to Energy Poverty Diagnosis. European Comission. https://energy-poverty.ec.europa.eu/discover/publications/publications/energy-poverty-advisory-hub-epah-handbook-1-guide-energy-poverty-diagnosis_en

[2] Torrego-Gómez, D., Gayoso-Heredia, M., San-Nicolás Vargas, P., Núñez-Peiró, M., & Sánchez-Guevara, C. (2024). Recognising summer energy poverty. Evidence from Southern Europe. Local Environment, 1–29. https://doi.org/10.1080/13549839.2024.2303456

[3]IPCC. (2022). Climate Change 2022 Summary for Policymakers. https://www.ipcc.ch/report/ar6/wg2/chapter/summary-for-policymakers/

Energy consumption vs. the thermal comfort in energy poor households

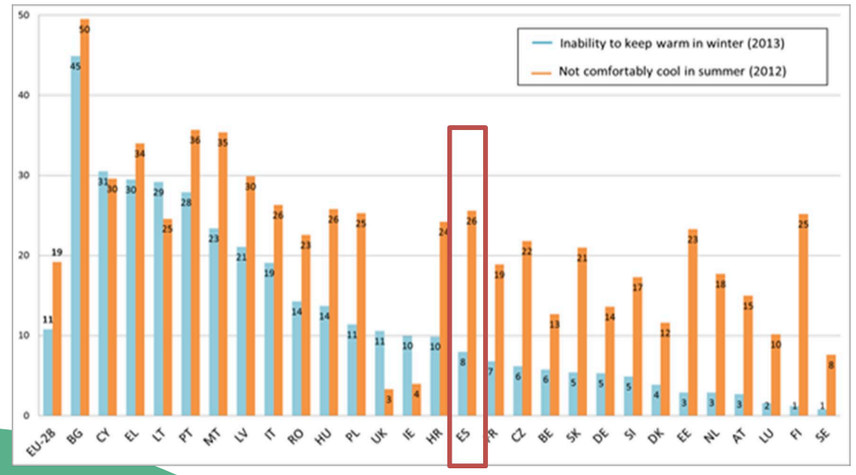

Figure 1 Percentage of households unable to keep their homes warm in winter and households declaring not being comfortable in summer in all EU-28 countries. Source: Eurostat

When addressing energy poverty, it is important to recognize that affected households typically either face excessive energy expenditure (such as spending more than double the median of their energy income, according to some indicators) or engage in restrictive energy use. Even though both situations could be a consequence of low-income, high-energy prices or lack of energy efficiency in the dwellings or the appliances, the outcomes vary slightly. An effort to pay energy bills may have as a consequence the deprivation in other areas of the household's needs (such as food, education or health care). On the other hand, restriction in energy use could result in a lack of thermal comfort which may imply several health impacts.

According to the data from the EU Statistics on Income and Living Conditions (EU-SILC), 9,3% of households in Europe reported an inability to keep their home adequately warm in 2022. This situation is even more difficult for countries like Bulgaria, Cyprus, Greece, Lithuania, Portugal, Spain or Romania (all of them with an indicator value above 15%).

While the winter situation is well-documented, obtaining a comprehensive picture for the summer is more challenging. Data for only a few countries are available for 2022, and some of them show a worsening trend. For example, in Portugal, 38.3% of the population reported living in dwellings that are not adequately cool in the summer, compared to 35.7% in 2012. For most other countries, the latest available statistic on summer comfort is from 2012, when 19% of the population reported being uncomfortable in their homes. In 2013, 11% of the population declared an inability to keep their homes adequately warm. These statistics support the hypothesis that more households struggle to maintain comfort in summer conditions compared to winter conditions.

According to the report "The Future of Cooling"[4] by the International Energy Agency (IEA), the air conditioning penetration rates in Europe are relatively low, with less than 45 million units of air conditioning in residential buildings, which implies only 9 units per 100 inhabitants. However, since the average summer temperatures and extreme heat events are increasing, it is expected that this indicator will worsen.

While in winter people can use clothes and blankets to reduce their heating needs, passive options are limited during hot summer days. Without air conditioning, people can either rely on electric fans or leave their houses looking for a climate shelter.

[4]. Birol, D. F. (2018). The Future of Cooling Opportunities for energy- efficient air conditioning. International Energy Agency.

Increasing health impacts of heat waves in the Mediterranean bassin

Energy poverty has clear health impacts on individuals, primarily stemming from inadequate temperature and poor housing conditions. While these effects have been extensively studied in the context of winter conditions, the risks associated with summer conditions present distinct and particularly severe challenges. The summer of 2022, marked by record-breaking heat, witnessed over 61,000 deaths across Europe[5]. Women were more affected than men, and southern countries such as Italy, Greece, Spain, and Portugal experienced higher heat-related mortality rates.

While some studies suggest a reduction in mortality attributed to increased air conditioning usage in homes during heatwaves, this solution brings negative consequences such as increased emissions and intensifies the urban heat island phenomenon[6]. Given that a portion of summer mortality can be linked to the urban heat island[7], addressing this phenomenon should be prioritized as part of adaptation and heat mitigation strategies, instead of increasing the use of air conditioning.

Heat-related mortality often results from a range of health issues including mental and nervous system disorders, cardiovascular, respiratory and kidney diseases. Additionally, heat can adversely impact pregnant women, potentially leading to premature births. Vulnerable groups include not only the elderly and individuals with preexisting medical conditions but also children and outdoor workers[8].

[5] Ballester, J., Quijal-Zamorano, M., Méndez Turrubiates, R. F., Pegenaute, F., Herrmann, F. R., Robine, J. M., Basagaña, X., Tonne, C., Antó, J. M., & Achebak, H. (2023). Heat-related mortality in Europe during the summer of 2022. Nature Medicine, 29(7), 1857-1866. https://doi.org/10.1038/s41591-023-02419-z

[6] Achebak, H., Rey, G., Lloyd, S. J., Quijal-Zamorano, M., Fernando Méndez-Turrubiates, R., & Ballester, J. (2023). Drivers of the time-varying heat-cold-mortality association in Spain: A longitudinal observational study. Environment International, 182, 108284. https://doi.org/10.1016/j.envint.2023.108284

[7] Iungman T, Cirach M, Marando F, Pereira Barboza E, Khomenko S, Masselot P, Quijal-Zamorano M, Mueller N, Gasparrini A, Urquiza J, Heris M, Thondoo M, Nieuwenhuijsen M. Cooling cities through urban green infrastructure: a health impact assessment of European cities. Lancet. 2023 Feb 18;401(10376):577-589. doi: 10.1016/S0140-6736(22)02585-5.

[8] Tobías, A., Armstrong, B., Gasparrini, A., & Diaz, J. (2014). Effects of high summer temperatures on mortality in 50 Spanish cities. Environmental Health, 13(1), 48. https://doi.org/10.1186/1476-069X-13-48

Proposals for measuring the improvement of energy-poor wellbeing and health

Enhancing Energy Poverty Project Evaluations: Prioritizing Wellbeing and Indoor Comfort Through Improved Energy and Health Certificate

As explained in the previous sections, adopting a new approach to evaluating projects aimed at tackling energy poverty is advisable. Therefore, it is crucial to shift the focus away from solely measuring energy savings and towards prioritizing indoor comfort and temperature and the overall wellbeing of households.

- Evaluation of Energy Demand Reduction Using Energy Certificates: Assess improvements in energy demand indicated by home energy certificates. Current building energy certificates primarily provide a score based on two fundamental values: non-renewable primary energy consumption (kWh/m2) and CO2 emissions (kgCO2/m2year) but fail to account for passive building performance, which directly impacts thermal comfort. To enhance policy effectiveness, it's crucial to incorporate energy demand indicators that are independent of HVAC systems. This will ensure, in policies and projects, a more effective improvement in the well-being conditions of households experiencing energy poverty.

- Development of a Health Certificate for Buildings: To elaborate a new health certificate for buildings, according to building characteristics (not human behaviour) that affect health and wellbeing directly, such as air quality, toxicity of materials, exposure to winter energy poverty, exposure to summer energy poverty, etc. Similar to energy certificates, this label should feature user-friendly categories and indicators.

- Direct Temperature Measures on Dwellings: Promote the monitoring and measurement of indoor thermal comfort conditions through direct temperature measures. This suggestion could be covered by setting up a program to encourage monitoring of indoor conditions in households with a high risk to suffer from energy poverty.

Evaluating Heat Resilience and Summer Wellbeing in Households through Enhanced Data Collection

This text highlights the importance of comprehensive data collection on households' cooling capabilities, access to climate shelters, and overall resilience to heat. Emphasizing qualitative approaches, it advocates for reintroducing wellbeing questions from the 2012 EU-SILC survey. Using indicators like "Dwelling comfortably cool during summertime" can enhance understanding and address summer energy poverty, improving public health and policy effectiveness.

- Gather information about households' availability (and use) of air conditioning, their capacity to reduce their heat exposure, such as access to cool spaces near their homes, including indoor and outdoor climate shelters like parks and/or pools. This information will also reflect the population's resilience to heat.

- Qualitative approaches have proven to be highly relevant, especially in evaluating summer energy poverty conditions. Reintroducing questions related to households expressing their well-being conditions in summer, as it was done in the 2012 EU-SILC survey where the households were asked if they were "living in a dwelling not comfortably cool during summertime", is of great importance.

- From the consensual approach, we propose using the EU-SILC indicator "Dwelling comfortably cool during summertime", derived from the answers to the questions "Is the cooling system efficient enough to keep the dwelling cool?" and/or "Is the dwelling sufficiently insulated against the heat?". This indicator, however, does not belong to the common target variables of this survey, but is part of an ad-hoc module that includes secondary variables related to dwelling conditions, and gathered only for the year 2007 (MH070, (European Commission 2007)) and 2012 (HC070, (Ministerio de Transportes Movilidad y Agenda Urbana 2018; European Commission 2010)).

Incorporating Wellbeing and Thermal Comfort Indicators in European Energy Poverty Projects

Incorporate these recommendations not only to public policies, but also in indicators and measurement impacts in European funded projects. Currently, the projects related to energy poverty are supposed to reduce the expenses of the households and the GHG emissions. However, the intended impact should focus more on increasing wellbeing and thermal comfort. This can be measured using several indicators:

- Reduction of the energy demand and measure of thermal confort: key indicators include the reduction of energy demand and the increment of hours spent in thermal comfort without the use of conditioning systems.

- Reduction of health risks: there should be a focus on reducing health risks due to inadequate dwelling performance, such as decreased mould presence, maintaining appropriate humidity levels, and improved air quality.

- Additionally, improvement in users' self-reported situations, including household comfort, the ability to pay bills without financial strain, and not being forced to reduce energy consumption or other needs, is crucial.

- Another important metric is the reduction of health problems related to energy poverty and exposure to extreme temperatures.

- Finally, increased access to better-conditioned locations, such as climate shelters during summer, should also be considered. These indicators collectively aim to enhance the quality of life and ensure sustainable living conditions for all.

Enhancing Database Insights to Address Health Inequalities and Energy Poverty

Reconsider the information included in databases to gather data regarding the determinants that generate inequalities on health, such as income, type of employment, quality of housing, age, gender, etc. This would allow to determine which households are in a more vulnerable position also, by understanding the environment and context, to increase the effectiveness of policies and measures implemented to reduce the energy poverty. Include health impact assessment and health risk reduction, via health studies to:

- Address the health determinants and environment of the people, the relation between health and building age, socioeconomic situation, location in a deprived neighbourhood...
- Measure the impact of energy poverty reduction on mental and physical health. Provide data for further studies.
- Build capacity among health workers to identify patients/cases of energy poverty situations (and to send them to other public resources to alleviate their situation). Promote collaboration between different public resources to create common knowledge and provide a more interdisciplinary solution to energy poverty.