Summer energy poverty in Mediterranean urban areas

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Summer energy poverty in the policy debate: the case of Mediterranean urban areas

In the EU, about one fifth of the population (or over 100 million people) cannot afford to keep their homes comfortably cool in summer [1]. This means that we should not think of energy poverty in Europe only in terms of people suffering from cold homes, but also in terms of people living in over-heated dwellings.

Heat waves and their accompanying extreme weather events – droughts, fires, storms – are disproportionately hitting the most vulnerable parts of global populations. When heat waves occur, those with lower incomes, people of colour, unemployed, elderly, women, people with health issues and homeless people are on the frontlines, as they tend to live in the most inadequate homes (or are homeless) and have the least access to cooling [2], [3], [4]. In cities, the urban heat island effect exacerbates heatwave conditions, with climate change driving summertime urban thermal discomfort and indoor overheating [5].

As an overall trend, climate change is predicted to yield a growing number of extreme climate events which will increase in both intensity and frequency [3]. Studies show that heat waves could increase 50-fold by 2100, leading to increased number of deaths caused by intense summer heat [2]. The first part of the IPCC's Sixth Assessment Report, Climate Change 2021: The Physical Science Basis [6], brings some stern messages regarding the rise of temperatures and hot extremes in Europe. The key message is that the temperatures will rise in all European areas

at a rate exceeding global mean temperature changes. The frequency and intensity of hot extremes, including marine heatwaves are projected to keep increasing.

For the Mediterranean region specifically, there are some further relevant messages [6] with summertime precipitation decrease projected in most future scenarios. Next to the projected increase in aridity, an increase in fire weather conditions at a global warming of 2°C and above is also forecasted. Such trends are also visible in the number of 'cooling degree days' – a metric that estimates the number of days in which a building is assumed to need cooling – which have seen a steady rise in Europe since the 1980, especially in the Mediterranean and Balkan countries. Still, research indicates that populations living in regions where extreme hot weather is relatively infrequent (e.g. Northern and Western Europe) are more vulnerable to heatwaves because of their poorer adaptive capacity and housing suited to cold rather than hot climate [4]. If we combine these predictions with signs that show more and more people are subject to various vulnerabilities (low income, unemployment or precarious employment, advanced age, etc), this leads to an estimate that summer energy poverty is going to be on a rise in the future. This means that policy-makers in the EU and especially in the Mediterranean region must urgently recognise the rising threat of summer energy poverty.

Still, summer energy poverty still receives little attention of the media and decision-makers. Thus energy poverty definitions — traditionally understood through the lens of wintertime heating and comfort — require an effective or more decisive recognition of summertime cooling needs [1]. Cooling and summertime thermal comfort need to be recognised as important aspects in current energy poverty imaginaries.

Plans and policies for tackling summer energy poverty are urgently needed. Policies and measures need to include at least investments in comfortable energy-efficient dwellings, more green spaces in cities, well-designed street vegetation, green roofs and walls providing insulation and shade to buildings [1], [4]. These plans need to be especially adjusted for the most vulnerable. Priority needs to be given to policies and strategies related to building retrofit in order to improve overall building stock energy efficiency and leverage the potential of renewable energy sources [5]. When retrofitting, it is necessary to consider occupants and their profiles as well as the dwelling construction details when choosing the most appropriate interventions [2]. Urban-scale interventions aimed at mitigating heat islands in urban areas by creating favourable micro-climates at the grain of the street and neighbourhood are also important, such as the incorporation of green areas and urban shading systems [9].

Apart from material interventions in the urban fabric, community (i.e., beyond single household) approaches are emerging in response to summer energy poverty challenge. In Barcelona, the City Council has put in place a network of 'climate shelters' that as of summer 2021 consisted of 162 open air and indoor locations (including parks, sport centres, museums, libraries and schools) evenly distributed across the city (so that 87% of the city's population had a shelter within a 10 minutes' walk from home) and open to the public from mid-June to mid-September. These public facilities are designed as climatically safe spaces with maximum temperatures of 26°C, water and resting areas that offer relief against high temperatures and humidity [10]. However, it is important to stress that such approaches cannot and should not substitute structural policies and measures to ensure comfortable and healthy dwellings for all. The risk is that they may contribute to further socio-spatial segregation in cities as users of 'climate shelters' will often be low-income population who cannot afford appropriate cooling equipment at home and are forced to seek temporary respite from high temperatures in public spaces.

As coastal urban areas in the Mediterranean are 'hotspots' of tourism, tensions between locals' and tourists' demand for housing lead to housing unaffordability. This tension makes it difficult for low-income households to find adequate dwellings. To this end, tackling summer energy poverty must go beyond the income-price-efficiency 'triad', which is traditionally considered to set the context for addressing energy poverty. Housing policies need to be questioned to ensure that energy efficiency upgrades to the buildings do not increase structural injustices behind housing. Without addressing the structural injustices in housing sector, upgrading the building stock can lead to unaffordable housing, gentrification and segregation. Renovation policies and strategies must go beyond immediate financial impacts and outcomes, acknowledge housing market mechanisms and externalities, and focus on improving the lived experience of people [11].

Mediterranean coastal urban areas are also affected by precarious, low-quality jobs (e.g., in the tourism and hospitality sectors, or in harbours and connected transport hubs). Also, in this aspect tackling energy poverty must go beyond the 'triad'. Labour policies need to be redesigned in a way that low-quality and precarious jobs are de-stimulated, while maintaining and creating quality jobs, promoting decent work, raising labour standards, promoting gender equality, and introducing workplace democracy should be prioritised to ensure decent living conditions for people to avoid energy poverty [12]. Labour policies have to target the most vulnerable people and communities proactively [11].

Research perspective on summer energy policy

Summer energy poverty receives little attention also from a research perspective. Indoor cooling-related deprivation is a research topic in its 'infancy', despite many researchers arguing for a year-round conceptualisation of the issue that includes all energy services in the home [4], [9]. A significant data gap remains [7]. While metrics and indicators are largely available –despite shortcomings – for monitoring cold weather-related energy poverty, little data is available on summer energy poverty [2], [4]. The EU Survey on Income and Living Conditions (EU SILC) is the only pan-EU official data source on domestic cooling, specifically in its two ad hoc modules from 2007 and 2012, which included the following two items: 1) Dwelling equipped with air conditioning facilities = Yes/No (for 2007 only); and 2) Dwelling comfortably cool during summer time = Yes/No (2007 and 2012). However, as of 2020 Eurostat had stopped collecting data on these two items [4]. Therefore, a first challenge is the gathering of data for summer energy poverty metrics and include summertime aspects in existing definitions and indicators [1], [4], [7], [13]. In addition, data would be also needed on topics such as the final energy demand for space cooling in residential buildings, the availability of cooling systems, on health impacts of high temperatures. Data collection, however, should not only be organised on an ad hoc basis, but in a way that allows monitoring incidence and trends.

Previous research has also examined human health and wellbeing impacts related to domestic cooling via a vulnerability lens that considers the dynamic interaction between three main factors: 1) exposure, e.g., the likelihood of overheating at home; 2) people's adaptive capacity or ability to respond to inadequately high temperatures at home; and 3) people's sensitivity to overheating, i.e., the risk that it will have harmful consequences for their well-being [4]. Since heat- and cold weather-related risks are not always perceived as a personal threat by vulnerable individuals [3,4], raising awareness of temperature-induced health risks remains important. There is little evidence, nevertheless, on the lived experience of summer energy poverty and on how different sociodemographic groups respond to such conditions [14, 15]. Research is also needed on how summertime energy poverty interacts with other related forms of material deprivation such as, e.g., people's inability to afford summer holidays – in the understanding that this may be a relevant coping strategy for escaping the heat in Mediterranean cities.

While the quality and energy performance of residential buildings is key for assessing summer energy poverty, 'beyond dwelling' interventions such as green roofs, urban shading and urban greening have been clearly identified in the literature as a suitable approach to improve domestic thermal comfort in cities [4,

9]. Yet further research is much needed in accessible and climate-responsible ways to tackle summer energy poverty, be it in the field of buildings renovation or in the field of passive cooling.

All in all, an enhanced, broader understanding of energy poverty will lead to a better assessment of the problem and give the opportunity of setting better solutions for impacted households [9]. Integrating summertime and indoor cooling-related dimensions in energy poverty definitions is therefore of paramount importance. As EU member states (re)shape their national in response to the requirements of EU directives, opportunities arise to ensure that governments at all levels pay much-needed attention to summer energy poverty issues.

References

[1] Covenant of Mayors, "Alleviating energy poverty," 2020. [Online]. https://www.eumayors.eu/support/energy-poverty.html. [Accessed: 21-Jul-2020].

[2] Friends of the Earth Europe, "The danger and the injustice of summer energy poverty," 2019. [Online]. https://www.foeeurope.org/danger-injustice-summer-energy-poverty-240719. [Accessed: 21-Jul-2020].

[3] D. O. Åström, B. Forsberg, and J. Rocklöv, "Heat wave impact on morbidity and mortality in the elderly population: a review of recent studies," *Maturitas*, vol. 69, no. 2, pp. 99–105, 2011.

[4] H. Thomson, N. Simcock, S. Bouzarovski, and S. Petrova, "Energy poverty and indoor cooling: An overlooked issue in Europe," *Energy Build.*, vol. 196, pp. 21–29, 2019. https://www.research.manchester.ac.uk/portal/files/99295898/1_s2.0_S0378778818324307_main.pdf [Accessed: 16-Nov-2021]

[5] C. Sanchez-Guevara, M. N. Peiró, J. Taylor, A. Mavrogianni, and J. N. González, "Assessing population vulnerability towards summer energy poverty: Case studies of Madrid and London," *Energy Build.*, vol. 190, pp. 132–143, 2019. https://www.researchgate.net/publication/351073528_Exposure_and_Vulnerability_towards_Summer_Energy_Poverty_in_the_City_of_Madrid_A_Gender_Perspective [Accessed: 16-Nov-2021]

[6] IPCC. 2021. Sixth Assessment Report. Working Group I – The Physical Science Basis. Regional fact sheet – Europe. [Online]. https://www.ipcc.ch/report/ar6/wg1/downloads/factsheets/IPCC_AR6_WGI_Regional_Fact_Sheet_Europe.pdf. [Accessed: 16-Aug-2021].

[7] European Energy Network, "EnR Position Paper on Energy Poverty in the European Union," 2019.

[8] S. M. Porritt, P. C. Cropper, L. Shao, and C. I. Goodier, "Ranking of interventions to reduce dwelling overheating during heat waves," *Energy Build.*, vol. 55, pp. 16–27, 2012.

[9] H. Thomson and S. Bouzarovski, "Addressing Energy Poverty in the European Union: State of Play and Action," 2018.

[10] Ajuntament de Barcelona, 2021. Xarxa de refugis climàtic. 2021. [Online]. https://www.barcelona.cat/barcelona-pel-clima/ca/barcelona-respon/accions-concretes/xarxa-de-refugis-climatics [Accessed: 16-Nov-2021]

[11] Cornelis, M., ed. 2021. A toolkit for a just transition with the people. [Online]: http://www.engager-energy.net/wp-content/uploads/2021/11/Engager-Toolkit-_-draft-2.pdf [Accessed: 6-Jan-2022]

[12] ETUC. 2021. ETUC's position on the creation of a second ETS on road transport and building and of a new Social Climate Fund. [Online]. https://www.etuc.org/sites/default/files/document/file/2021-12/ETUC%20position%20on%20the%20creation%20of%20a%20second%20ETS%20on%20road%20transport%20and%20building%20and%20of%20a%20new%20Social%20Climate%20Fund_1.pdf [Accessed: 6-Jan-2022]

[13] P. Palma, J. Pedro Gouveia, and S. G.Simoes, "Mapping the energy performance gap of dwelling stock at high-resolution scale: Implications for thermal comfort in Portuguese households," *Energy Build.*, vol. 190, pp. 246–261, 2019.

[14] Y. Strengers, C. Maller, Adapting to 'extreme' weather: mobile practice memories of keeping warm and cool as a climate change adaptation strategy, Environ Plan A. 49 (2017) 1432–1450.

[15] L. Middlemiss, R. Gillard, V. Pellicer, K. Straver, Plugging the Gap Between Energy Policy and the Lived Experience of Energy Poverty: Five Principles for a Multidisciplinary Approach, in: C. Foulds, R. Robison (Eds.), Advancing Energy Policy, Springer International Publishing, Cham, 2018: pp. 15–29.

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