European Energy Poverty

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Policy Brief

The summertime energy poverty problem

Energy poverty does not only mean suffering from the cold, but also enduring the heat

Largely due to climate change, heat waves are becoming a new characteristic of European summers. It is estimated that heat waves kill about 12,000 people every year around the world. More than 70,000 additional deaths occurred in Europe during the summer 2003. In the EU, about one fifth of the population (or over 100 million people) cannot afford to keep their homes comfortably cool in summertime. 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 summertime energy poverty - impossibility to keep homes adequately cool in summer. It is predominantly an issue in Southern and South-East Europe and the Mediterranean regions, but overheating during summer occurs all across Europe, including within countries that have milder climates and where this phenomenon was thought to be rare.

Summertime energy poverty hits disproportionately the most vulnerable

Heat waves and their accompanying extreme weather events – droughts, fires, storms – are disproportionately hitting the most vulnerable parts of the population. 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 none at all) – insulated poorly or not at all, not equipped with cooling system, cannot afford cooling and/or are bound to unbearably hot public transport for commuting.

Health implications of summertime energy poverty

Overheating can cause several health-related problems. Symptoms of arthritis, pulmonary, cardiovascular, and respiratory illnesses deteriorate in houses that are not adequately cool. Also increased mortality rates can be related to extremely high temperatures in the house. In this respect, a warmer world will imply that more people will need access to cooling measures worldwide to live in a healthy indoor environment. Need for space cooling may also increase households' energy consumption, especially in poor quality dwellings, potentially creating social justice issues among vulnerable population groups and also leading to psychological and social health issues, related to energy poverty, such as depressions, anxieties, marginalisation, isolation and stigmatisation.

Summertime energy poverty to rise in the future

The recently released first part of the IPCC's Sixth Assessment Report, Climate Change 2021, brings some stern messages: the temperatures will rise in all European areas at a rate exceeding global mean temperature changes and the frequency and intensity of hot extremes, including marine heatwaves are projected to keep increasing. Specifically, for the Mediterranean region, there are some further relevant messages. Namely, precipitation decrease is projected in summer in the Mediterranean. Next to the projected increase in aridity, also fire weather conditions at global warming of 2°C and above are projected.
Studies show that heat waves could increase 50-fold by 2100, leading to increased number of deaths caused by intense summer heat. Future climate scenarios point to an increase in the number and intensity of heat waves in Southern Europe, making it a particularly vulnerable region to the adverse impacts of high temperatures on thermal comfort. Coupled with signs that show more and more people are subject to various vulnerabilities (low income, unemployment or precarious employment, lack of adequate housing and transport, advanced age, etc), this leads to an estimate that summertime energy poverty is going to be on a rise in the future.

Policy agenda

Attention and action needed to tackle summertime energy poverty

With summertime energy poverty on the rise, policy- and decision-makers in the EU and especially in the South, South-East and Mediterranean region must urgently recognise the threats of summertime energy poverty. Yet, summertime energy poverty still receives little attention of the media and decision-makers, while also being scientifically and statistically under-explored.
As detailed below, priority should be given to tackling structural causes of energy poverty such as adequate housing, urban planning and transport. Policies and measures need to include at least provision of regular transparent and independent data on summertime energy poverty, building codes that pay attention to cooling needs, urban and transport planning that designs resilient cities, investments in comfortable energy-efficient dwellings and employment of renewable sources of energy. These policies need to take into full consideration the situations and conditions of the most vulnerable.
It is important to stress that tackling summertime energy poverty can also contribute to the reaching of climate objectives and reduction of greenhouse gas emissions.

Climate adaptation plans to embrace summertime energy poverty

What we urgently need is to start developing plans on how to tackle climate change adaptation, considering hotter summers. We need to include heat wave scenarios, extreme weather response measures, rethinking urban and transport planning, cooling energy demand in buildings etc. in climate change adaptation planning. Need for building design and building refurbishment needs to be based on the implications of projected climatic scenarios in the cooling demand increase rather than on past climatic data. The adaptation plans need to be especially adjusted for the most vulnerable and well embedded in the EU climate policy as well as in national and local climate strategies.

Spatial and transport planning and urban interventions

Urban-scale interventions aimed at mitigating heat islands in urban areas are important, such as the incorporation of green areas and urban shading systems. As it is a common coping strategy for people affected by overheated dwellings to spend more time in cooler places away from home, like a friend’s house, an air-conditioned shopping centre or library,

or an outdoor park, urban interventions can play a role in tackling summertime energy poverty.

The strategies for urban interventions vary from using vegetation (for shading and evapotranspiration) in parks, streets, private gardens, green roofs or green facades, to urban planning measures (building density and geometry), using water bodies for cooling and working with high albedo materials for making roofs and pavements (also pervious pavements). Green vegetation seems to be the most effective measure and applying more green public spaces has a relative low cost and high acceptance among citizens. Guaranteeing access to green space for all communities is vital. However, it needs to be stressed that ensuring that people, affected by summertime energy poverty can access parks is not a substitute for having a home with a healthy indoor thermal comfort. Instead, people's homes should provide sufficient shelter.

Planning our transport systems needs to take into consideration the needs of the most vulnerable parts of the population (who tend to be subject also to transport poverty), while at the same time acknowledging the climate trends and adjusting to them (e.g. ensuring that means of public transport do not get overheated in summer).

Redesigning building standards for increased cooling needs

While social energy tariffs for vulnerable consumers might need to constitute a part of the answer to summertime energy poverty, priority needs to be given to policies and strategies related to building retrofit and changing building standards in order to improve overall building stock energy efficiency. While ongoing renovation of dwellings is reported to work well for winter time, the comfort in summer is not improved (e.g. shading is missing).

National building energy-efficiency regulation very often does not consider the installation of cooling measures and designs during either the design or retrofitting process. Building location and the type of ventilation system (i.e., natural, mechanical, or a combination of both) can play an important role in cooling, specifically to provide natural ventilation at night, decrease cooling load and increase thermal comfort. This is why the building standards will need modifications to pay attention to the cooling demand increase. This must be kept in mind also when designing social housing and/or retrofitting vulnerable households' dwellings to mitigate energy poverty. Instead of prioritizing only solutions that reduce household energy consumption, priority should be given to providing an adequate indoor thermal comfort, when necessary also by installing cooling measures.

Employing accessible low-tech solutions

Thermal retrofitting strategies for reducing winter heating demand can lead to enhanced resilience to summer heat, so they are the first step in the right direction. However, additional measures are needed to ensure reduced levels of overheating. Inhabitants' practices have a significant influence on resilience and the reduction of overheating.

Increased use of domestic air conditioning as the key cooling measure is concerning not only because it amplifies pressure on electricity grids during summer (which could become unmanageable in combination with the cooling demands from non-domestic buildings, such as hotels and offices), but also because it creates tensions with goals for climate protection. It can also become a source of potential financial vulnerability for households. While encouraging further efficiency improvements in air conditioning, policymakers should nevertheless first focus on cooling measures that do not involve air conditioning, such as nature-based and passive-cooling solutions.

Passive cooling comprises all those natural or passive techniques that can help maintain indoor thermal comfort, while requiring minimal or zero energy input. They can focus on

- preventing solar heat gains: (vegetation) shading, (vegetation or water) roof, improving glazing properties, painting external surfaces white;

- modulating heat through utilisation of buildings' thermal mass: an effective measure to reduce temperature fluctuations during the day, but a slower reduction of air temperature during the night; and
- dissipating heat: natural ventilation, use of the ground as a heat sink (earth to air heat exchangers), and evaporative cooling (direct and indirect).

Passive cooling techniques and systems may also be used to improve the outdoor urban environment and fight heat island. Expected energy savings may reach 70% compared to a conventional air-conditioned building while substantial improvements have been measured in outdoor spaces. It is needed to highlight that the technical interventions must be accompanied by clear strategies to empower inhabitants to control internal temperatures (e.g. using natural ventilation).

Engaging renewable energy sources to tackle summertime energy poverty

Leveraging the potential of renewable energy sources in the fight against summertime energy poverty is a win-win-win solution. A wide range of renewable cooling solutions is available, hence integration of renewables for tackling summertime energy poverty needs to be wide-spread. Also participation of vulnerable people in general deployment of renewables needs to be promoted.

Empowering vulnerable people to participate in the energy transition is gaining traction, but their participation in renewable energy communities still needs a better support. Enabling flexible membership rules to make renewable energy communities accessible to all, supporting renewable energy communities by easing energy market regulations so that these energy actors could align their energy transition mission with a social purpose engaging with vulnerable households and stimulating local partnerships are some of the possible measures to make renewables work for a just energy transition that leaves no one behind. The use of accessible renewable technologies (e.g. plug-in balcony PV modules) should be eased by clearing the regulatory pathway for them.

As people, affected by energy poverty, tend not to have sufficient means for investments in renewable systems, alternative funding schemes must be developed so that vulnerable parts of the population have access to renewables.

Finally, it is also important to highlight that decentralised, small-scale production sites are emerging as alternative cold providers. Amongst available technologies, renewables based district cooling can play a vital role in the space cooling sector. Installing decentralised district cooling plants in urban areas with high cold demand density can increase flexibility of cooling supply by reducing the stress on electricity systems.

Solutions need to focus on people, not only technology

Cooling solutions must be occupant-centred rather than solely focused on technology. Passive and technical solutions to reduce cooling energy demand in buildings, which enable occupants to interact with building’s systems to adapt to the indoor environment, must be taken into consideration. It is necessary to consider occupants and their profiles when choosing the most appropriate interventions.

Structural changes to tackle summertime energy poverty

Because energy poverty is deeply rooted in our current economic and societal set-up, we need to look at a wider context when talking about summertime energy poverty. To successfully tackle energy poverty, we need to recognise that energy poverty causes go far beyond the triad of "low income - poor energy efficiency - high expenditure", which is traditionally considered to set the context to addressing energy poverty. Experience and research shows that drivers of energy poverty are more structural - they span, at least,

across our current economic, social, employment, energy, climate, taxation, welfare, housing and health policies.
Some of the areas, most affected by summertime energy poverty - coastal urban areas in the South-East Europe and the Mediterranean - are 'hotspots' of tourism and hence tensions between locals' and tourists' demand for housing lead to housing unaffordability. These tensions make it difficult for low income households to find adequate dwellings. To this end, tackling summertime energy poverty means questioning our housing policies to ensure that tourism expansion and energy efficiency upgrades to the buildings do not increase the structural injustices, which 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.
Furthermore, the South-East Europe and Mediterranean coastal urban areas are also affected by precarious, low-quality jobs (tourism, harbours…). Also, in this aspect tackling energy poverty must go beyond the 'triad'. Labour policies need to be redesigned in way that low-quality and precarious jobs are put lower in the list of priorities, while focus is given to the quality employment with decent earning. Labour policies have to target the most vulnerable people and communities proactively.

Research agenda

Understanding summertime energy poverty better

As mentioned above, summertime energy poverty still receives little attention, despite many researchers arguing for a year-round conceptualisation of the issue that includes all energy services in the home. The first challenge is to understand and analyse the summertime energy poverty phenomenon.

While statistical services are monitoring winter energy poverty, little data is available on summertime energy poverty. Data gathering on summertime energy poverty, energy needs and actual final energy demand for space cooling within the residential buildings, availability of cooling systems in residential buildings and health impacts of summertime energy poverty is a much needed first step. Better data availability can help us understand the problem better. 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 people. It is also important to monitor trends, hence data collection should not only be organised on an ad-hoc basis, but in a way that allows monitoring trends in summertime energy poverty. It would be also relevant to research how to best integrate summertime energy poverty aspects in energy poverty definitions.

Searching for suitable solutions

Further research is needed in accessible and climate-responsible ways to tackle summertime energy poverty, be it in the field of buildings renovation or in the field of cooling and urban interventions. As transport poverty is extremely under-explored and articulated problem, which is linked also to summertime energy poverty, more exploration of the field is needed. We also need a better overview of housing stock and demographic make-up in relation to space cooling. Research of this nature should take into consideration the importance of humidity in how high temperatures are experienced. Research should consider the inequities around space cooling as part of a wider set of difficulties in securing adequate energy services.

Gender perspective in summertime energy poverty

There is more and more evidence that women and women-led households are disproportionately affected by energy poverty. However, focused studies of effects of summertime energy poverty on women are lacking. Research should be directed into studying the gender / intersectional aspects of summertime energy poverty, designing energy poverty definition that takes gender and intersectional aspects into account, collecting sex-disaggregated data with an intersectional perspective (race, age, class, ability...) on energy poverty, engendering energy poverty indicators, involving women in all their diversity in design of policies and measures, protecting women against rising rents or other costs due to renovation or deployment of renewables and prioritising women in energy poverty actions.

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