6 Understanding the Lived Experience of Summer Energy Poverty through Participatory Action Research

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6.1 Introduction

According to the Eurostat survey[1], more than 20% of households in southern European countries declared that they are unable to keep their homes in comfortable conditions during summertime. In the context of climate change, it is also known that extreme hot weather and heat waves are expected to increase. Different reports and studies predict that the impacts of these extreme events will worsen for those households suffering from Summer Energy Poverty (SEP) (Founda et al., 2019; Santamouris & Kolokotsa, 2015).

Compared to the literature focused on the study, energy poverty linked to winter conditions is still an overlooked issue (Thomson et al., 2019), and both the characterisation and measurement of the phenomenon are in the very initial stages. The review of methods, definitions (Middlemiss & Gillard, 2015), and characterisation of energy poverty points out a lack of summer dimension in the studies focused on the phenomenon (Gayoso et al., 2022). It is only possible to measure SEP by using secondary indicators that are only available for limited countries and annual periods whose consultation is freely accessible from the website of the Energy Poverty Advisory Hub. Although the influence of different features is well documented in the urbanscape with the experience of heat, there is a total absence of indicators that could guide policy makers to reduce the vulnerability related to heat exposure.

During summertime, cities located in Southern Europe such as Madrid experience an increase of social activities in public space. For vulnerable households, using public space may respond to a need to find a climatic shelter and avoid extreme indoor temperatures (Tsoulou et al., 2020). Although there is a growing interest in characterising the urban scale of the phenomenon by studying Urban Heat Islands, passive urban mitigation, or urban microclimates (Sanchez-Guevara et al., 2019), there is not yet a qualitative characterisation focused on relationships and community strategies to cope with excessive heat.

Qualitative research methods allow for the characterising of household strategies that cannot be reflected in quantitative databases and go beyond the dwelling usage and the individual scale. The few studies carried out exploring summer energy poverty (Gayoso et al., 2022) identify the phenomenon as more difficult to characterise from a quantitative perspective since qualitative aspects such as behaviour, adaptation strategies, and cultural factors have a great influence on how to perceive and cope with high temperatures. There is not yet sufficient methodological framework that integrates the lived experience into the study of energy poverty. This is especially relevant for summer conditions where thermal adaptation relies mainly on users' habits. Thus, sharing methods and insights derived from fieldwork are essential to develop a premature body of literature and raise awareness to make the adaptation process accessible to manage the impacts of climate change.

DOI: 10.4324/9781003408536-8

The use of public space integrates the dynamics and logics of the community that shares a location (Leivas, 2019), and it is diverse from one community to another. Therefore, delving into collective experiences becomes important to get a more complete picture of relations and resources that may alleviate energy poverty. Regarding qualitative research studies, participatory action research and focus groups are the most common methods used to characterise energy poverty from a collective perspective (Grey et al., 2017; Lorenc et al., 2013). However, only a few experiences focused on energy poverty have been conducted, and the application and integration of techniques into energy poverty studies have room to improve.

COOLTORISE is the first project to be funded by the European Commission to deepen and widen the understanding of SEP in the context of southern Europe. Four countries participate in the project: Spain, Italy, Greece, and Bulgaria. The main objective of the project is to raise awareness of summer energy poverty and reduce cooling needs by working together with households on integrating passive strategies to cope with the heat and improve indoor thermal conditions during summertime. For this aim, the project offers different workshops to increase summer energy culture. Understanding home usage patterns related to improving summer thermal comfort and reducing energy needs (e.g., optimising the use of solar shades, night ventilation, and cooking habits). Also, different workshops are focused on understanding energy bills and how to reduce their cost. Finally, another set of workshops were aimed to improve public space through collective outdoor intervention to obtain climatic shelters. The project's main activities will be developed during the summers of 2022 and 2023 reaching up to 7,240 beneficiaries.

This chapter presents insights regarding the implementation of Participatory Action Research and qualitative research methods for focus groups during the activities developed within the COOLTORISE project for the case of the city of Madrid. The chapter is structured as follows: in the first section, an approach to the phenomenon of SEP and qualitative research is introduced, in addition to the framework of the project in which the methodological proposals have been implemented; in Section 2, the scale of actions and the activities carried out are reviewed, together with the methodological proposal implemented in each activity to achieve the objectives described. Section 3 presents the results obtained in relation to the lived experience for each of the activities described; finally, Section 4 establishes the contribution of each methodological proposal in relation to the knowledge of the lived experience and how the information extracted from the experiments can be used to tackle Summer Energy Poverty.

6.2 Methods

Among the activities proposed within the COOLTORISE project in the city of Madrid, three different workshops have been designed that integrate qualitative research methods to explore and bring new insights into how vulnerable households cope with heat. A total of four collaborative mapping workshops have been conducted between June 2022 and September 2022, and 35 people have participated (Table 6.1).

The activities proposed have followed an approach to understand the lived experience of SEP involving different scales: the housing scale, where participation is based on the self-reported strategies to cope with the heat at home, and is materialised in energy culture workshops; the urban scale, where participation is based on sharing experiences of location-based knowledge, and is addressed with collaborative mapping workshops; and the body scale, where participation has been focused on testimonies of the lived experience using public space while taking a walking-tour workshop.

Participatory Action Research is an approach that is applied not only to understand the behavioural actions and habits of the participants but also to bring about change by actively involving

Table 6.1 Relation of type of workshops, number of participants, gender and profiles

Type of workshop	*Number of participants*	*Gender (non-binary was an included option, but the sample was 0)*		*Profiles*
Energy Culture Workshops	131 people	Women: 98	Men: 33	Older adults from municipal centres for older adults (ages > 55) 2022 The European researchers' night Municipal cultural centres Municipal equality community centre
Collaborative Mapping Workshops	35 people	Women: 25	Men: 10	Older adults from municipal centres for older adults (ages > 55)
Walking Tour Workshops	10 people	Women: 10	Men: 0	Older adults from municipal centres for older adults (ages > 55)

Source: Own elaboration.

them to take part in the solution and raising awareness to address the problems identified (De Haro & Koslowski, 2013). It differs from other methods because the aim is to enable actions achieved by participants: they collect and analyse data and decide the action that should follow. This structure changes the power relationship between participant and researcher and shares the power as researcher and participants become partners.

A focus group is a qualitative research method in which a small group of people, usually six to ten, are brought together to discuss a topic. The discussions are led by a researcher who asks open-ended questions to encourage dialogue and exploration of different perspectives.

From the perspective of those studies that integrate focus groups and Participatory Action Research (PAR) as methods within the research, it is possible to find some barriers when introducing focus groups in a conventional way regarding object-subject research relationships (Chiu, 2003). Also, focus groups allow participation in a very homogenous and limited way, as oral participation is the only way for expression instead of more visual or other methods of expression. Reformulating and transforming conventional methods allows other forms of participation to arise that attend better to diversity.

In the context of climate change and adaptation in cities, it is clear that effective mitigation cannot be achieved if different actors act independently: climate change has the characteristics of a global collective action problem, so cooperative principles and participative approaches are essential to address mitigation and adaptation (IPCC, 2022).

For each of these scales, participation implies different types of samples. Regarding the housing scale, the strategies described correspond to a reality that encompasses the cohabitation unit. Participants reflect the routines and consumption habits adopted by the dwellers. On an urban scale, the description of climatic shelters, paths, and routes transcends personal experience and entails a reflection of community networks and social interactions. At the body scale, however, the experience of each person is reflected in relation to the individual and local conditions at that moment.

6.2.1 Energy culture workshops

The aim of the workshop is to explore the strategies that participants already know and have incorporated in their dwellings to cope with heat and then to include new unknown strategies that can potentially improve their indoor thermal conditions and reduce cooling needs. The objectives in a more abstract sense are concerned with the revaluation of knowledge, empowerment, and

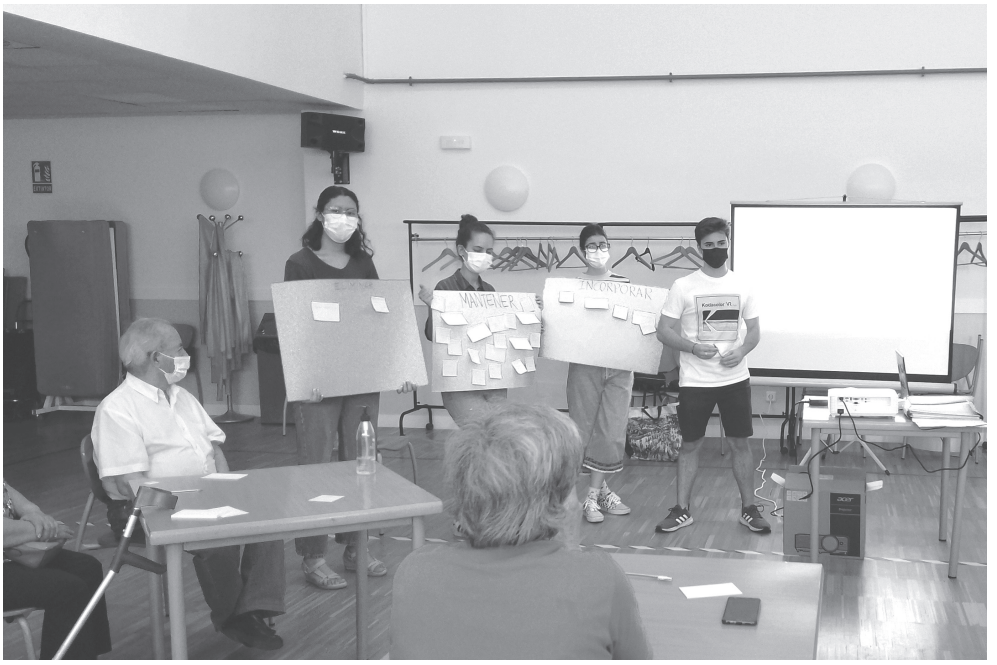

Figure 6.1 Energy culture workshops. As can be seen in the image, the participants are wearing masks. This is due to the fact that the workshops were held at a time when precautions related to COVID-19 had to be taken. This had no meaningful impact on the engagement of participants.

Source: Photograph by Marta Gayoso.

carefully listening to voices (H. Yoon & Saurí, 2019) that do not require technical training to know which strategies could be implemented in their dwellings. To this end, these workshops have been provided to groups of eight to ten people who belong to vulnerable neighbourhoods (Figure 6.1). The considerations relate to the climatology of the location, the type of construction, and socio-cultural factors and belong to the collective wisdom (Day & Hitchings, 2011; O'neill et al., 2006; Pelenur & Cruickshank, 2013). In the context of adaptation to climate change, it is essential to focus on local needs and specific conditions to identify suitable strategies.

At the beginning of the workshop, participants describe which strategies they already use during the summer to cope with high temperatures by writing these down on sticky notes. Secondly, a theory presentation is conducted by the workshop facilitators focused on passive conditioning and a brief review of what strategies are appropriate for their local climate to cope with excessive heat. This is followed by a discussion of the strategies that were reported at the beginning by the participants. These strategies are reviewed among all participants, and the strengths, weaknesses, and limitations encountered in implementing the strategies are discussed. Finally, those strategies that were not presented at the beginning of the workshop and that can be implemented to improve indoor thermal conditions are introduced.

To conclude, participants were asked to reflect on the strategies discussed on three different panel boards (see Figure 6.1) to facilitate better visualisation of results. On one panel, they locate the strategies to eliminate as they are contraindicated for combating heat, while on another panel they locate the strategies to maintain, which are those that are already incorporated in their day-to-day lives and are favourable to them. On the third panel, they locate the strategies to implement, which are those that the participants can incorporate after receiving the theory presentation.

6.2.2 Collaborative mapping workshops

The aim of this activity was to identify existing climate-related resources and shelters that exist (Hunt et al., 2018) in a shared location and to analyse the routes, paths, and public spaces from the perspective of their summer usage. The secondary objective was to generate a space for conversation and sharing of knowledge between different people from the same location in order to raise awareness of the importance of public space as a potential universally accessible resource for dealing with high temperatures (Yoon et al., 2022). These workshops complement the body/dwelling/building scales explored in the Energy Culture Workshops incorporating an urban scale in the dialogue. For vulnerable households, the identification of available climate shelters near their locations may reduce their exposure to extreme temperatures at home.

These workshops are carried out with groups of ten to 15 people who shared the same neighbourhood. To do this, large-format, unlabelled maps of the locations were prepared and printed to allow for additional information to be written directly onto them (Figure 6.2). The mapping codes used were shared with the participants and the person facilitating the workshop guided them on which elements are to be mapped, at each stage of the workshop. These codes included elements that describe key places, pathways and routes, sun/shade zones, greenery, blue infrastructures, and public facilities.

During the workshop, predetermined questions were asked about the use and perception of public space from a SEP perspective, to facilitate participation (Table 6.2).

The results of the mapping were photographed and transferred to a collaborative online map, to record the elements and comments that emerged during the workshops. Also, this was done in order to return the results to the participants so that they can include further comments and relevant information and continue to complete the map.

Figure 6.2 Collaborative mapping workshop.

Source: Photograph by Daniel Torrego.

Table 6.2 Predefined questions used in the mapping sessions. They encouraged labelling actions on the maps provided in the workshops

Collaborative mapping workshop questions script
Which places in your immediate surroundings are more pleasant during the summer?
Do you adapt the spaces and activities in which to meet and enjoy leisure activities according to the season? Are these options free, paid or linked to consumption?
Which places are not in your immediate surroundings and require transport but are also nice places to go to in summer or winter?
What is the existing vegetation, what are its characteristics?
What vegetation has existed in the past, and what were the causes of its disappearance?
Is it possible to identify areas and routes with specific uses that have shade for use during the summer?
Is it possible to identify areas and routes with specific uses that have sunlight for use during the winter?
What surfaces are in this space? What is the state of the street furniture or other equipment?
Are there any fountains, pools or water facilities that cool the environment?

Source: Own elaboration.

6.2.3 Walking tour workshops

The objective of this activity was to visit the points identified and described in the Collaborative Mapping Workshop activity to record how they actually are used and what is the embodied experience (Brager & de Dear, 1998; Shirani et al., 2020). In this activity, the information that emerges is related to the history and community codes that exist around the local microclimate. For instance, alternative routes to the ones described, usage schedules of common spaces, and descriptions of health impacts that relate to the public space were all considered. As a secondary objective, the aim was to have a more detailed record of the problems and improvements to be implemented in spaces that already serve as climate refuges and that can potentially serve as climate refuges. Also, it was hoped participants could create a space where the body experience is also expressive, going beyond the oral testimonies (Longhurst & Hargreaves, 2019; Pink, 2011).

In this workshop, participants belong to the same sample as in the collaborative mapping workshops, although the workshop was also open to new participants who come from the locale where the activity took place.

Initially, participants are informed of the route to be followed during the activity. This route has been previously designed based on the results recorded during the mapping session, ensuring accessibility, shade, and refreshment points were available. For each point along the route, a sheet with a special template was designed and printed to direct on-site recording of the problems detected, the potential for improvement, and the history or other uses that the place has had in the past (Figure 6.3).

The records made on the sheets were also collected and added to the collaborative online map. This enabled us to complete the registration of the resources to cope with heat.

6.3 Results

In this section, the results obtained in relation to the lived experience for each of the proposed activities are presented.

6.3.1 Results for energy culture workshops

Within this activity, the results collected for a sample of 13 workshops carried out between May 2022 and October 2022 are presented. They are based on a sample of 131 people. Results

Figure 6.3 Walking tour workshops.

Source: COOLTORISE project images (all participants).

are classified into three categories: strategies and resources that households use incorrectly and therefore need to be modified or eliminated; those already known and carried out by the participating sample; and those unknown to dwellers. In order to validate these last ones, after participation in the workshops, households express whether they will be prone to implement them (Table 6.3).

- Habits to be eliminated: in some workshops, households reported misuse of natural ventilation. Ventilation is used in some cases during the central hours of the day when the outside temperature is high, and some participants express a belief in forcing cross ventilation with the use of a fan as an air circulator. This is enhanced when the facade or envelope is not efficient enough to maintain a low indoor temperature. The use of evaporative coolers without proper ventilation of the dwelling was also reported as counterproductive.
- Habits to be maintained: in general, strategies that have to do with keeping the body at an adequate temperature are the most common and widespread actions expressed by the participants, positively responding to awareness campaigns by public health institutions. Strategies such as taking short, cold showers, eating cold meals, avoiding physical activity during central times of the day, or adapting clothing are known. At the dwelling scale, attempts are also made to block the entry of sunlight by using blinds.
- Habits to be implemented: in general, the specific bioclimatic criteria necessary for the climatic zone in which the activities have been developed for Madrid are not known. No awnings are installed for shading, delegating sun blocking only to the lesser effective blinds; strategies to favour evaporative cooling such as spraying water on curtains or mopping the floor are unknown; there is no housing design that incorporates cross-ventilation strategies.

Table 6.3 Summary of results for energy culture workshops

	Body scale	*Dwelling scale*
Habits to be eliminated		Misuse of ventilation. Placing water containers instead of choosing shallow containers, as they don't facilitate evaporative cooling. Evaporative coolers without proper ventilation.
Habits to maintain	Quick and cold showers. Cold meals. Avoiding outdoor activities during central hours.	Using blinds to block the sun.
Habits to implement		Installing awnings. Cross ventilation and evaporative cooling strategies such as mopping the floor or spraying water.

Source: Own elaboration.

For those households that can afford air conditioning, possible passive strategies to be implemented are not explored.

6.3.2 Results for collaborative mapping workshops

The results are summarised in four categories:

- Outdoor space: locations that have a recreational character and are not merely transit areas have been identified. For each location, the available sunlight/shading, the presence of blue infrastructure, the existence or absence of vegetation and the activities associated with it have been described. In general, the mapping activities described outdoor sites with no water infrastructure or drinking water points, little shading, and no strategically placed vegetation to provide relief in the summer. The mapped spaces do not incorporate a bioclimatic design that adapts materials and resources to reduce the effects of the urban microclimate.
- Indoor space: the climatic shelters available for summer use are mostly privately owned. On the one hand, there are swimming pools and residential facilities, which, although communal, are only available to households and their networks; on the other hand, there are spaces associated with commercial uses, such as the market, restaurants, or shopping mall; there are also communal places such as the residents' association or the church, but these are also places with restricted use. There are only indoor public places such as libraries, health centres, cultural centres, or municipal centres for older people, with limited opening hours and possibilities for use.
- Paths and routes: Through these mapping processes, it was possible to identify the most common existing routes and paths and how they are modified during the summer depending on the solar incidence or other overheating factors. During the rest of the year, the criteria for the layout of the routes are marked by the time variable, so that the most common routes are the shortest; in summer, these routes are modified, and the most common routes are not the shortest but those that incorporate the better shade. During the mapping sessions, reference was also made to the elimination of certain routes due to the impossibility of adapting

them to a path with more shade. Consequently, some places initially thought of as being useful as climatic shelters were discarded.

- Memories and disappeared places: in these mapping activities, those who had a more extended knowledge of the area described and identified old climatic shelters or elements that have disappeared and that served as a relief from the high temperatures. The disappearance of numerous water points, vegetation, and green spaces was noteworthy.

6.3.3 Results for walking tour workshops

This activity was carried out only once, with a sample of ten people. The results of this activity are classified into three categories:

- Strategies to cope with the high temperatures: some strategies that have to do with corporal expression and that did not emerge during the energy culture workshops could be registered during the walk. Actions such as fanning oneself or drinking water had not been mentioned among the strategies analysed in previous activities and could directly relate actions to places; looking for resting points and water refilling points conditioning the use of outdoor space were not aspects that received consideration for the routes described during the mapping, but they did during the walking tour activity.
- In-situ reporting of the experience of heat: during the walk, it was possible to collect the testimony of the people who participated in the activity in relation to their experience while experiencing high temperatures. Tiredness, annoyance, and overwhelming were sensations that were recurrently reported; thirst or the need to wear fewer clothes were also reported during the activity.
- Reporting resources and urban elements in poor conditions: this activity served to report numerous flaws or aspects to improve in terms of the urban design. The needs identified allowed numerous ideas and improvements for the space to be incorporated when using the space during the walking tour activity.

The latter can be exemplified in the more concrete results that were obtained in the mapping and walking sessions from knowledge of the participants' situations. Two specific locations can be singled out as particularly relevant for the participants in summer. The first of them is a location aggravating the experience of heat, and the second one is an attenuator of the same. The sidewalk space in front of the pharmacy was identified as a place prone to generating discomfort due to overheating. The pharmacy was considered a hotspot because of the participants' need to go to the pharmacy for medications and the absence of a shaded space for the waiting queues that form in front of the door (Figure 6.4). On the other hand, the local church emerged as a commonly agreed-upon place that could alleviate excessive heating conditions among the participants. The building's thick walls provided a cool space inside (Figure 6.5). This is a space open to visitors, and many of the people spoken to declared it as a space they would take refuge in during times of extreme heat in the neighbourhood.

6.4 Discussion and conclusion

The experiences shared in this chapter aim to contribute to the knowledge on the characterisation of the lived experience of energy poverty. The activities that are described here can be replicated in different settings with different groups of people to generate more insights.

Figure 6.4 C. Guetaria Pharmacy. As can be seen in the image, the absence of shading elements on the facade encourages situations of overexposure to the sun.

Source: Photography: Google Street View.

Figure 6.5 San Bartolomé Church. Several participants mentioned this place as a cool resource to go to on the hottest days.

Source: Photograph from Google Street View.

It has demonstrated the usefulness of PAR (Revez et al., 2020) and the adaptation of methods such as focus groups for the detection of EP (Energy Poverty Advisory Hub, 2023), the characterisation of SEP, and the in-depth study of the phenomenon from the body scale to the urban scale.

In particular, Energy Culture Workshops made it possible to characterise the existing deprivation of cooling and situations of energy poverty through the habits of household use (Gayoso Heredia et al., 2022). In addition, taking a deeper look at the gender perspective, it is possible to detect how household installations and resources are managed to cope with heat. For example, ventilation schedules or shading are added to all the caring tasks carried out by women. These also contribute to a greater understanding of the gendered nature of energy poverty, as the most vulnerable households depend on these passive cooling strategies to a greater extent than those households that can afford to use air conditioning (Nicholls & Strengers, 2018). On the other hand, the use of these workshops has achieved the intended secondary objective of intergenerational and intercultural knowledge sharing.

The mapping activities enabled participants to focus on their urban perceptions in relation to heat and how daily pathways related to it are enacted. These pathways are more complex than the home-work-home displacements of full-time employed workers, as they involve more stops and non-linear routes (Gil Sola & Vilhelmson, 2022). These daily care-related trajectories are affected by different factors such as affinities and security perception, points of relationship with the environment (water points, benches and other street furniture, etc.), the existence or not of climatic shelters, the public or private nature of the climatic shelters and their access rules, etc.

Through these mapping activities, it has been possible to detect how informal networks fulfil citizens' needs that are not covered by public resources. As an example of this, swimming pools in private communities and affinity or caring networks emerge as *cooling* resources.

The use of walking tours has allowed for other forms of knowledge expression to emerge, such as situated knowledge (Haraway, 1988), and to discover what is otherwise not accessible through traditional interviews. These types of understandings about specific geographic locations achieve an in-situ account of the experience of heat that is not possible by conducting traditional interviews alone.

In relation to the different results obtained according to the workshop modality, some interesting aspects emerged. In the energy culture workshops, the results mainly focus on the patterns of use, habits, and concrete actions aimed at reducing energy consumption at the household and building level. There are hardly any results for solutions outside the home or actions that have to do with the body in public spaces. Therefore, the results obtained in the collaborative mapping workshops are important to characterise the phenomenon of summer energy poverty as they contribute to an urban and microclimatic scale that complements the discourse on patterns of use inside the dwelling. The emotional and subjective aspects are only present during the walks, where the actions to combat the heat in situ allow for the construction of a personal heat perception narrative.

In addition to the secondary objectives pursued, such as the revaluation of knowledge, community work, and the strengthening of other methods of recording and expression, the implementation of the PAR and adaptation of the focus group method in the study of SEP is important in terms of its potential contribution to the design of public policies and urban design. This experiment makes it possible to address urban heat as a public matter of concern. The mixed methodologies implemented allow to evaluate the social and local dimension of urban heat, yielding fundamental information for climate change adaptation in the cities.

Acknowledgements

This research was conducted within the scope of the COOLTORISE project, funded by the European Union's Horizon 2020 research and innovation programme under the Grant Agreement No. 101032823. Participants provided informed consent for publication of the images included in this chapter.

It has also been granted by *Next Generation EU*-Margarita Salas grants, Universidad de Alicante (MARSALAS21-32).

Note

1 Graphical information at https://www.eea.europa.eu/data-and-maps/figures/percentage-of-households-unable-to. Regarding a more recent survey on winter conditions (2020), 8% of EU population declare the inability to keep home adequately warm. https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20211105-1. There is no updated data for summertime conditions.

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