



Report on key approaches of low carbon lifestyle changes

D6.1

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GDP	Gross Domestic Product
GHG	Greenhouse Gas
IPCC	Intergovernmental Panel on Climate Change

Executive Summary

This report is intended for civil servants, policy advisors, and researchers seeking to develop equitable climate policies for citizens. In particular, it aims to enhance the information available to local administrators and decision makers regarding the realistic greenhouse gas (GHG) emissions reductions can be achieved through behavioral changes towards low-carbon lifestyles among various groups of citizens, especially those most severely affected by climate.

The report explores key approaches of low-carbon lifestyles for European citizens. Drawing from semi-qualitative methods of social sciences, it incorporates citizens' perspective on climate change and policies geared towards mitigating and/or adapting to its impacts. By prioritizing traditionally underrepresented groups, this report integrates a justice-oriented approach into climate policy discussions. By employing the concept of intersectional social vulnerability, this report not only elucidates perceptions of exposure to adverse effects of climate change and policies, but also tackles the social and personal limitations of vulnerable groups in adapting to necessary changes. One of the report's key insights is that (voluntary) lifestyle changes are only possible within a limited range, which is dependent on the individual's position in society. Furthermore, when policies entail enforcement of low-carbon consumption or behavior patterns, the needs of vulnerable groups must be taken into account. Empirical evidence suggests that members of vulnerable groups are less prone to support rapid and bold measures against climate change. Therefore, integrating diverse groups into decision making and participatory policy design is highly recommended to increase the social acceptance of measures and successfully achieving the set goals.

Within the LOCALISED project, the results of this study will serve as a foundation for the evaluation of mitigation and adaptation policies and measures (Task 4.1), in particular regarding their fairness (Task 8). Additionally, the report will act as an initial step towards mapping vulnerable groups (Task 6.2) as well as creating a Blueprint for Citizens Engagement (Task 6.3). It is imperative that citizen engagement is tailored to the unique needs and living conditions of vulnerable (and hard-to-reach) groups to ensure their meaningful participation will lead to fruitful discussions.

As demonstrated in this report, selecting the appropriate climate policies does not only hinge upon technical considerations. Instead, citizens' perspectives and societal possibilities must be considered as well. In other words, it is essential to recognize that climate policies – even if called-for scientifically – may face resistance from groups with vested interests. Low acceptance may not only come from vulnerable groups, but at least as much from powerful groups and influential entities.

1. Introduction

The European Union and its Member States committed to reduce the GHG emissions to avoid catastrophic climate change, as per the United Nations (2015) and the European Climate Law (Regulation 2021/1119) (2021). Given that citizens are the ultimate consumers of energy, goods and services associated with greenhouse gas emissions, one starting point for meeting these targets could involve changing peoples' day-to-day behaviors.¹ In fact, certain consumption patterns and lifestyles can be linked to intense GHG per capita emissions (see Lewis Akenji, Magnus Bengtsson, Viivi Toivio, et al., 2021, pp. 32). The latest IPCC report emphasizes this correlation: "Behaviour, lifestyle, and culture have a considerable influence on energy use and associated emissions, with high mitigation potential in some sectors, in particular when complementing technological and structural change" (IPCC, 2022, p. 41). By avoiding carbon-intensive consumption, such as using inefficient heating systems or frequently consuming meat, citizens can significantly lower their carbon footprint and thereby reduce emissions. One promising aspect of this line of argument and approach is that changing individual behavior appears to be much easier than investing in efficient infrastructure, redesigning business sectors, or overhauling entire tax systems. However, this argument overlooks the social resistance and citizen dimension of the issue, as demonstrated in this report.

Citizens play a key role in determining the future outcome of climate change because the implementation and, ultimately, success of climate policies depends on their cooperation or at least their acquiescence. Even more so, if such policies impact and – potentially change – citizens' personal lifestyles. This report thus seeks to understand citizens' perspectives and needs regarding lifestyle changes in greater depth. By combining findings from desk research and an empirical survey, this report aims to answer to the following questions: What proportion of GHG reduction is achievable through behavioral changes of the citizens? What is the likelihood of individual-level shifts towards low-carbon lifestyle options? Which policies, advancing certain low-carbon lifestyles, may disadvantage citizens, particularly the vulnerable groups, and thus risk being unjust?

The report is organized around three core parts: It begins with the topic of low-carbon lifestyles and their relevance for meeting climate and decarbonization targets. It argues that emission reductions hypothetically resulting from low-carbon lifestyles may be limited by citizens' living conditions and attitudes. Therefore, a policy that aims to change eating habits, for example, "by changing the diet to 100% vegan, x tons of GHG can be avoided", may ultimately be less effective than anticipated if citizens do not accept it, and/or cannot act on it. Worse yet, such a policy may lead to adverse effects in terms of social justice and fairness. The first part of the report thus widens the focus from GHG reduction

¹ Other options include focusing on private companies or public administrations.

potentials of low-carbon lifestyles to include individual choices and structural constraints.

The second part delves deeper into the impact of climate change, demand of behavioral change, and lifestyle policies on diverse groups of citizens, including vulnerable and traditionally underrepresented groups, from an intersectional perspective. The argument put forward is that citizens are not a homogeneous entity but are comprised of various groups, some of whom are better equipped to adopt low-carbon lifestyles and implement the changes than others who face structural barriers and/or a spectrum of discrimination mechanisms. If this disadvantage is to be alleviated, the needs of these vulnerable groups must be specifically addressed (Kaijser and Kronsell, 2014). It is worth noting that the current report provides a *preliminary* definition of vulnerability as a basis for further research in Tasks 6.2 and 6.3. A more detailed examination of vulnerable groups will, however, only be provided in Task 6.2 (Mapping of vulnerable groups exposed to low-carbon lifestyle options), which is scheduled for completion in March 2024.

The third part of this report weaves the insights gained from the preceding chapters into the layout for an empirical survey that investigates prospects of citizens towards lifestyle changes in the three focus cities/regions of Barcelona, Gdansk-Gdynia-Sopot Metropolitan Area and Vienna. To gain a deeper understanding of prevailing attitudes and views on climate change and related policies and lifestyles, the innovative semi-qualitative Q method is utilized. In contrast to other quantitative tests and standardized surveys, this approach not only tracks how many people hold certain opinions (distribution of opinions across a sample), but rather *how* they view specific issues and what they value most when confronted with difficult choices. Moreover, the Q-method generates insights on subjective perceptions and attitudes *of* individuals, as well as the spectrum of subjectivity *within* a group of people (McKeown and Thomas 2013; see also the upcoming Empirical Survey – Q Method chapter, p. 25).

The synopsis then connects the findings from the empirical survey to the potential of lifestyle changes. It demonstrates that political adaptation and mitigation measures aimed at meeting climate and decarbonization targets need to consider two important aspects:

First, the measures must attend to vulnerabilities of citizens and should, therefore, incorporate their perspectives right from the beginning, by utilizing more participatory processes. Secondly, policy effectiveness should not only rely upon altering consumption patterns but, instead, exhaust the full potential of political tools available, including those that do not focus on individual behaviors.

2. Technical Documentation

This chapter provides a brief overview of the procedural steps and methodological choices made to accomplish Task 6.1.

The following chart illustrates the work process:



Figure 1: Workflow of Task 6.1. Source: Authors

The initial step in achieving Task 6.1 was to conduct desk research on low-carbon lifestyles, lifestyles changes and social vulnerability. Based on the insights acquired from this research, it was decided that a semi-qualitative Q methodology would be more suitable than a quantitative online survey. As detailed further in the methods section, this choice was deemed necessary to gain a deeper understanding of citizen's perceptions of climate change impacts and possible measures against it. As our objective was to include and grasp the prospects of underrepresented and socially vulnerable groups of citizens, a quantitative online survey was not considered effective. The decision to use the Q method was presented at a project meeting in May 2022 and was followed by systematic consultations with representatives from other work packages. Additional methodological considerations were discussed at the second project meeting in October 2022. Iterative consultations with the focus regions/city partners (Barcelona, Gdansk-Gdynia-Sopot, Vienna) were also conducted to include regional specificities in the empirical survey. These consultations ensured that the research methodology was well-informed and appropriate for the specific research objectives.

The fourth step involved preparing statements for the Q survey. To create the concourse (i.e., a collection of statements for the survey), a diverse range of sources was consulted through desk research, including newspapers, interviews, academic publications, media, official reports, and communication from governmental and non-governmental institutes and administrations. The concourse encompassed positive, neutral and negative views on various aspects and sectors of climate change, climate policies, and behavior and lifestyle change (Damio, 2016, p. 107). Relevant aspects of the lifestyle research were also included in the collection, since the Q study aimed at a better understanding of possible or acceptable lifestyle changes. In addition, findings from the preceding

EU Calculator Project (Moreau, Vincent et al., 2017) and preliminary results from ongoing work in Task 4.1. (Database of potential adaptation and mitigation measures across European regions) were integrated. Finally, representatives from the focus cities/regions (Barcelona, Gdansk-Gdynia-Sopot, Vienna) suggested location-specific statements to enrich the concourse and tailor it towards the participants' (lived) experiences. A predefined set of categories were used to keep the concourse balanced. From this concourse, thirty Q Statements (the so-called "Q Set") were selected, and six city-specific statements were added to the generic set of thirty statements to create a tailored version for each focus region, resulting in three Q Sets. Socio-demographic questions were added to the survey derived from our definition of relevant vulnerable groups, to a) track the sample, where vulnerable groups should be represented, and b) to identify the perspectives of those specific participants. The Q Sets, socio-demographic questions and supplementary texts were translated into Polish, Spanish, Catalan and English. Subsequently, an online tool was chosen for the survey and offline interview kits were prepared. In collaboration with focus cities/regions, the survey was disseminated in all focus regions once. Afterward, a check was conducted on the sample against the pre-defined distribution of vulnerability criteria, following which the survey was circulated again in a targeted manner.

Last but not least, the incoming data from the Q study was analysed and integrated with insights obtained from the desk research on lifestyles, policies, and vulnerabilities. Preliminary results from the survey were presented in a project meeting held in January 2023. An exchange with project partners working on Task 3.2 took place in February 2023 since scenarios were to be analysed from an intersectional perspective. As Deliverable 3.2 and 2.4 focused on data and algorithms until March 2023, integration of social aspects in the database will occur later.

Table 1: Timeline of Task 6.1

Duration	Completed Tasks
10.– 12. 05. 2022	Presentation of Q Method during the project meeting in Düsseldorf, Germany
19. – 21. 10. 2022	Additional presentation during the project meeting at the University of Twente, Enschede, Netherlands
15. 12. 2022 – 16. 01. 2023	Launch of the Q Study: German and English versions online, offline interviews in German in Vienna
21. 12. 2022 – 22. 01. 2023	Launch of the Q Study: Polish, Catalan and Spanish versions online
26. 1. 2023	Presentation of preliminary results during a virtual project meeting

3. Low-Carbon Lifestyles: Concept, Choice, and Options

The purpose of this chapter is twofold: (a) to examine the potential for reducing carbon emissions through certain lifestyle changes, which will be used as a basis for the empirical study described in chapter five (from p. 25), and (b) to explore the concept of lifestyle and the opportunities for modifying it.

3.1. Reduction Potentials of Low-carbon Lifestyles

As stated in the Introduction, in order to meet various climate and decarbonization goals, making changes to current lifestyle choices is vital. As the authors of a recent study by the Hot or Cool Institute state, “changes in predominant lifestyles, especially in high-consuming societies, will determine whether we meet commitments in the Paris Agreement and avoid dire consequences of climate change” (Lewis Akenji, Magnus Bengtsson, Viivi Toivio, et al., 2021, p. 12). The study offers an interesting overview over the reduction potentials of low-carbon lifestyles at the national level, comparing ten countries with different cultural backgrounds and GDP per capita. The report suggests a clear breakdown of lifestyles and investigates the ceiling levels for carbon footprints associated with certain lifestyles (see pp. 25). From the latter pathways, different scenarios to meet the 1.5 climate target (United Nations, 2015, Article 2) can be deduced.

The study highlights that the implementation of low-carbon lifestyles would imply drastic changes, as lifestyle footprints require to be drastically reduced in all countries research in order to meet the climate targets. For instance, Canada’s lifestyle footprint needs to be reduced by 82% by 2030 and 95% by 2050, while Finland’s numbers are respectively 74% and 93%. Even Indonesia, the country with the lowest lifestyle footprint in the study, still needs to reduce it by 68% by 2050 although they almost meet the proposed pathway for 2030. The study also identified transport, food, and housing as the lifestyle domains with the greatest reduction potentials, with transport being the most significant domain in four out of the ten countries analysed.

The “lifestyle footprints” is used by the authors to measure the total GHG emissions caused by the way people live in a particular country, including GHG emissions resulting from the production of goods produced in other countries, but consumed in the country at stake (for more details see p. 33; Lewis Akenji, Magnus Bengtsson, Viivi Toivio, et al., 2021). To reduce lifestyle footprints, the authors suggest several options. The first would be for individuals to shift consumption away from high-carbon options. Another one would be to produce and consume a given amount of goods, but in a less carbon intensive way (i.e. increase efficiency). The third option would be non-consumption – least promising in the food sector,

but potentially relevant for the transport or housing sectors (a.o., see p. 59). Earlier studies reached similar conclusions, dubbing the three options respectively: indirect reduction, direct improvement, and direct reduction. Another way would be to change the disposal behavior (indirect improvement; Schanes et al., 2016 p. 1036). Since most studies examine consumption instead of waste, the emphasis is on the first three options.

Based on these three behaviors change options, the authors calculate the following reductions through hypothetical lifestyle changes:

In high-income countries the largest reduction potential of 500 to over 1,500 kg CO₂e/person/year per option on average are car-free private travel, reduction of international flights, vegan diet, electric car, vegetarian diet, renewable grid electricity, vehicle fuel efficiency improvement, renewable off-grid electricity [...]. Most options are based on a modal shift from carbon-intensive to other lower-intensity consumption modes, such as car to public transport, fossil fuel to renewable energy sources, and meat to vegetarian nutrition sources. [...] The majority of the highest impact options are from the transport domain, while housing and food also offer major reduction potential through switching from non-renewables to renewable sources and through shifting dietary habits. (Lewis Akenji, Magnus Bengtsson, Viivi Toivio, et al., 2021, p. 61)

In the European context, the most relevant changes in lifestyles and related emission reduction potentials would be, as exemplified by Finland:

- Target: The *overall* lifestyle footprint (transport, food, housing, goods, and leisure) would need to shrink to a rather small share of 700 kg CO₂e/person/year by 2050, compared to the current footprint of 9,700 kg CO₂e/person/year in 2019. This means a reduction requirement of 9 000 kg CO₂e/person/year (see p. 43).
- Example one (viable): Reducing international flights by 50% would lead to a reduction of 620 kg CO₂e per person per year. This is a substantial share of the current 3,700 kg CO₂e/person/year for the transport domain, but a small contribution (6.9%) to the required reduction of 9,000 kg CO₂e/person/year.
- Example two (fictive): A fully vegetarian diet for all people living in Finland would lead to a reduction of 530 kg CO₂e/person/year (5.9% of 9000 kg). Going even 100% vegan would save 780 kg CO₂e/person/year (see p. 63). However, even this ambitious scenario leaves a substantial gap to the required 9,000 kg CO₂e/person/year.
- Example three (changed supply): A 100% renewable grid electricity would incur savings of 490 kg CO₂e/person/year or 5.4% of the required

reduction.

- Combined scenario: If all Finns cut their international flights by 50%, only live on plant-based food, and use 100% renewable energy, it would result in a reduction of 1,890 kg CO_{2e}/person/year or 21% of the required reduction.

In sum, if the reduction of carbon footprints were to be achieved through behavioral changes alone, everyday lives of European citizens would significantly transform (see p. 43; see also EU 1.5° Lifestyles project, 2022). In high income nations, the transition towards low-carbon lifestyles would necessitate the following measures:

- A reduce or avoidance of meat consumption by as many citizens as possible, or even a minimization of the share of all animal-based food in their diets;
- The adoption of renewable sources for grid electricity;
- The use of smaller flats/houses, which require less cooling and heating per person, as well as co-living arrangements in larger households to decrease the space used per person;
- A reduction in car traffic and air travel, which are the primary contributors to carbon footprint in the mobility and transportation sector; and
- A decrease in the consumption of consumer goods in high-income countries.

As has become evident, the most important alterations necessary to see a decline in carbon emissions would affect individuals' consumption and travel habits. However, this research is limited to a national level and thus fails to account for differences between various groups of people, especially those who are disadvantaged and at the risk of social vulnerability. Furthermore, such studies overlook the degree to which individuals have agency in their choice of lifestyles. To develop realistic strategies for promoting to low-carbon lifestyles, it is essential to consider how policies effect different groups and why certain populations may be more susceptible to change than others. Only by taking these factors into account can we formulate approaches that are both implementable and equitable.

3.2. *Defining Lifestyles, Choosing Lifestyles*

This chapter provides a definition of lifestyles, premised on the assumption that in order to effectively achieve climate goals, changes must be both feasible and fair. The feasibility dimension points towards the importance of understanding the extent to which lifestyle changes are a matter of personal choice. However, as will be elaborated further below, lifestyles are primarily shaped by from structural conditions over which individuals have little control. The fairness and social justice dimension raises the questions about the justice of lifestyle changes and their

potential impact on groups that are disproportionately affected by climate change. This topic will be taken up in the following chapter on social vulnerability.

The term “lifestyle” is employed in different contexts, including everyday speech. As a technical term, it was first introduced in Sociology as a means of understanding social distinctions between groups in society. This concept replaced the older notions of class (stressed especially by Karl Marx) and status (emphasized by Max Weber). In the 20th century, a growing number of theorists, such as Pierre Bourdieu, Ulrich Beck and Anthony Giddens, began to focus on the concept of lifestyles (see Sharlamanov and Petreska, 2020).

For this study, we use the following definition, proposed by Bell and Kenton. Their definition is useful since it sheds light on structural, behavioral and psychological dimensions of lifestyles:

A Lifestyle is “the distinctive pattern and manner of living that an individual or group uses to meet their biological, economic, emotional, and social needs that typically reflects their attitudes, beliefs, and values; a way of life.” (Bell, Kenton, ed. 2014)

As a “manner of living,” the concept of lifestyle serves as a benchmark for possible behavioral changes (Jensen, 2007, pp. 63):

“An individual can, in the form of different practices, express him- or herself through many lifestyles. For example, how to eat and what to eat (and drink); how to move around (by car, by bus, by bicycle, by foot, by aircraft, by boat and so forth) and where to travel, what to wear and when and where to wear it; where to live (urban, rural or in a suburb) and how to furnish; what to watch and read; what to work with; choice of education; how to engage politically or religiously; who to associate with; how (where and with whom) to spend leisure time; whether one uses drugs, tobacco or alcohol; and how to communicate (technology and language).”

Recent studies on the potentials of lifestyle changes to address climate change (see Lewis Akenji, Magnus Bengtsson, Viivi Toivio, et al., 2021, p. 41 and EU 1.5° Lifestyles project, 2022) categorize lifestyles into activities associated with food and nutrition, housing, personal transportation and mobility, consumer goods, leisure, services, and more.

The question that remains is to what extent individuals can opt for lifestyle changes, provided that they would choose to do so in the first place. Upon reviewing the current literature, it becomes apparent that there are limitations to a purely choice-oriented comprehension of lifestyles:

- As highlighted in the aforementioned definition, the foundation of individuals’ everyday practices is based on attitudes, beliefs, and value sets. Lifestyles are a means of self-expression and thus connected to

group affiliations. Therefore, even if people could, for instance, afford certain lifestyles easily, they may not adopt them if these lifestyles do not align with their underlying values and identities (Schanes et al., 2016, p. 1041). Furthermore, research shows that even if beliefs change, for example, due to awareness raising campaigns, “a change in belief does not necessarily result in a change of habit.” (Jensen, 2007, p. 68).

- Another point to consider is that some behavioral and lifestyle changes are more feasible and accessible to achieve than others. The ease of making changes is influenced by several factors, including the amount of time required, the costs and expenses involved, and the dependence on external infrastructures (Moreau, Vincent et al., 2017, p. 8; Lewis Akenji, Magnus Bengtsson, Viivi Toivio, et al., 2021, pp. 111, 126 and (Costa et al., 2021)). For instance, it is typically more challenging for individuals to relocate to another region or to switch to a new heating system than to opt for vegetarian options for meals. Income is another confining factor, as individuals with greater financial resources can more easily afford and adopt new lifestyles, such as purchasing a more efficient car or upgrading their heating system. Nevertheless, these choices are still constrained by structural factors, like one’s position in society, available infrastructure, and political contexts. People with less personal resources and/or external opportunities. Socially vulnerable groups, who have fewer personal resources, external opportunities and capitals, face additional barriers to making lifestyles changes (Cho et al., 2013; Sharlamanov and Petreska, 2020, p. 26).

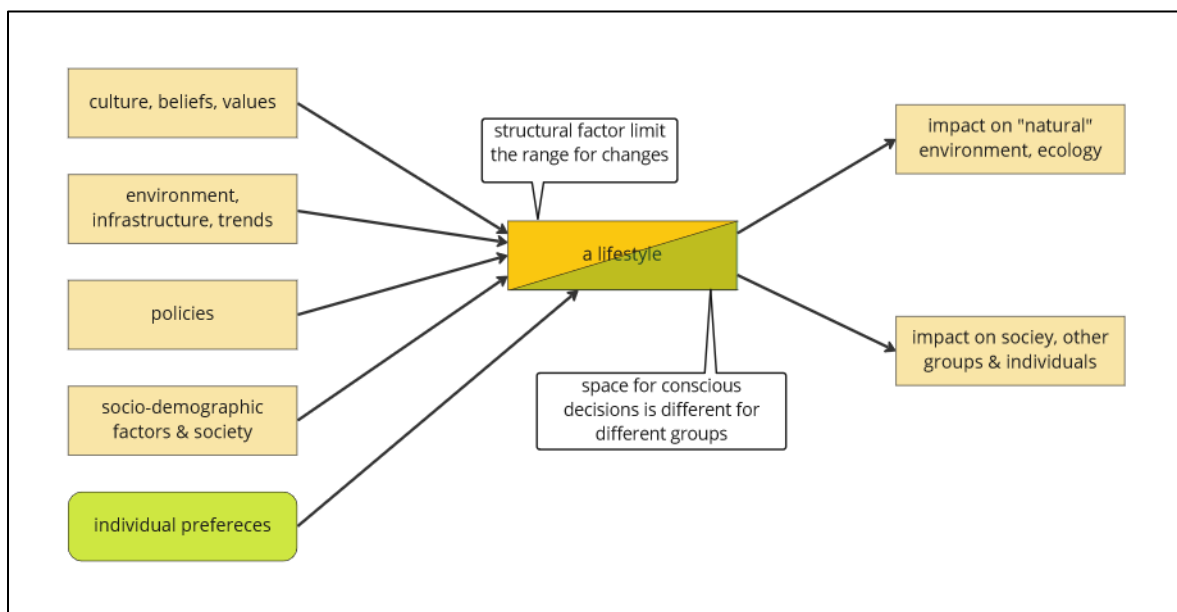


Figure 2: Lifestyle – Roots and Impacts. Source: Authors

The above graph illustrates several restricting factors that influence lifestyle choices, as well as some of the potential implications that a given lifestyle may have. The model offers a framework for understanding the complex interplay between individual behaviors and external factors and serves as a guide for further analysis in this report.

In sum, studies that solely compare GHG emissions associated with lifestyle changes and derive policy recommendations from them fail to consider crucial factors that foster or alternatively hinder such profound changes.² The question of whether lifestyle changes can effectively reduce GHG emissions through is largely hypothetical if one does not take “peoples’ dimension” into account. Lifestyles are not entirely subject to conscious change, but largely determined by structural factors. Altering one’s lifestyle is thus not an easy task, even if one desires to do so. Policy consultants and policy makers, and other influential actors need to consider both individual and structural constraints when setting climate targets that imply changes in lifestyles, as policies and other interventions (e.g. adaptation and mitigation measures) that fail to account for these limitations are likely to be ineffective.

4. Vulnerability and Vulnerable Groups

This chapter will discuss the concept of vulnerability in the context of climate change impacts and relate it to concepts such as risk and exposure. A preliminary definition has been created, as it is needed for the empirical survey (Q-study) and for further work in work package 6. In addition, a list of vulnerable groups was created, which will address their climate change challenges in more detail. Subsequent activities to map vulnerable groups (Task 6.2) will build on this, but the definitions can be refined as needed. The chapter aims to clearly illustrate why vulnerable groups need special attention when it comes to taking action on climate change. In particular, it shows that mitigation and adaptation – even if they make sense from an environmental perspective – may still not be feasible if they are disadvantaged and/or met with evasion or even resistance from disadvantaged groups of people.

² The oversimplified logic of this kind of analysis: “You can choose to live in a rural area, an urban area or a suburban area. You can choose to live in a house or in an apartment. You can buy or rent. You can live near a supermarket (mall) or near a local store. You can choose to go to the supermarket by car” (Jensen, 2007, citing others). But it is not true, that it is just a matter of choice: considering that 50.5% of Germans are tenants, it can be asserted for sure that not all of them have the option to go and buy their home. (Eurostat, 2021))

4.1. Defining Vulnerability

At first, risk and exposure seem to be helpful analytical terms when examining how diverse groups of citizens are affected by both climate change and climate policies. Risk arises from the interplay of natural hazards, vulnerability, as well as exposure. It encapsulates potential consequences with uncertain outcome when something valuable is at stake. Exposure, on the other hand, is the propensity that people and their livelihoods, entire species and ecosystems, or economic, social, or cultural assets could be adversely affected (Agard and Schipper, 2014; Lee et al., 2023). However, both terms fall short in capturing crucial aspects of socio-psychological affliction and structural limitations.

In contrast to this, the term vulnerability describes the sensitivity of a population, a group or an individual to climate-related hazards, as well as their resilience and recovery. "Vulnerability encompasses a variety of concepts and elements including sensitivity or susceptibility to harm and lack of capacity to cope and adapt." (Agard and Schipper, 2014) Today, the term is a key concept in the human development research and climate change assessment (Ziervogel et al., 2000); (IPCC, 2001), p. 6; IPCC, 2022b).

Natural scientists first used the term vulnerability in the context of climate change impacts on different spatial domains. Over time, the understanding of the term has evolved in each research community, and there is still no final definition shared by all. Broadly speaking there are two approaches: risk-oriented researchers define the term at the external level. Accordingly, vulnerability is about a system's exposure to shocks from external stressors, threats, or climate variability. It points towards the harm that has been or might be experienced by people, societies, or habitats (Burghardt, 2018; Burghardt et al., 2017)

In contrast, researchers from the climate change community focus also on the ability of individuals and/or systems to anticipate, cope with, and eventually recover and/or adapt from climate change (Breil et al., 2018; Otto et al., 2017). For instance, Cutter and Finch define the term as the sensitivity of a group or community to natural hazards as well as their response and recovery from them (Cutter and Finch, 2008) This approach seems fruitful for the purpose of the current report, since we aim to understand not only how certain groups are exposed to climate change and climate policies but also how such groups respond and adapt to change.

Another important aspect of social vulnerability in this sense is that it not only captures how individuals and groups are excluded from (literal and metaphorical) spaces in societies, but also how they are denied tangible resources, such as money, access to land, energy, etc., and intangible resources, such as emotional, physical or spiritual support (Breil et al., 2018; Collet, 2012). For example, Judith Butler conceptualizes vulnerability through the need for protection, support,

acceptance, affirmation, and recognition of others in order to survive and live well and happily (Pistol, 2016). Vulnerability thus encompasses both individual aspects of psychological and emotional distress and structural dimensions of group exposure to harm.

Finally, the term allows us to understand intersectional, and – even historically conditioned (Lee et al., 2023) – injustices related to climate change. Most often individuals belong to more than one groups, and are thus affected by more than one vulnerability. (Cho et al., 2013; Crenshaw, 2017) Internal vulnerability factors, including race, ethnicity, age, gender, sex, religion, disability, and general health, often overlap with each other. In addition, external factors might play a role, including the existence of social, cultural, and political networks, education levels, and socioeconomic status (compare Breil et al., 2018; Cutter and Finch, 2008) Political decisions, regulations and unbalanced or even unfair power dynamics heavily impact on all of these factors. Vulnerability thus has a crucial structural dimension to it: individuals, and groups, might be vulnerable to climate change also because they fail to be protected from political decision-making (or the lack thereof) (Cutter and Finch, 2008; Otto et al., 2017).

4.2. Vulnerable Groups and Climate Change

Building on the definition of vulnerability, this subchapter addresses vulnerable groups in the context of climate change and climate policy. Unfortunately, the current state of climate research devotes little attention for the perspectives of vulnerable groups. Research has focused more on stakeholders and individuals, who most likely do not belong to vulnerable groups (James et al., 2022), but this is beginning to change. The following chapter provides an overview of the little research there is in this regard.

Vulnerability in the context of climate change should be understood as a multi-layered process involving geophysiological, socio-ecological, as well as economic factors (Breil et al., 2018). Vulnerable groups are highly exposed to extreme weather and environmental disasters due to certain traits they share. These include traits such as health status, age, disabilities; but socioeconomic factors such as poverty, poor education, or racism, sexism, transphobia, or queerphobia (Gaard, 2015a; Gabriel, 2017). In addition, power dynamics need to be factored into the analysis.

With this understanding in mind, supposedly 'natural disasters' are not so natural anymore. To give an example: Famine in countries of the global South is usually incorrectly viewed as a natural phenomenon related to geological and/or meteorological conditions. However, to fully understand how people become vulnerable to famine, socio-political factors and even postcolonial effects have to be considered (Collet, 2012). Simply put, famine does not only afflict a female,

analphabetic, middle-aged woman because she happens to live in the Sahel zone, but also because she does not have the same access to resources, knowledge, and power, as a male, educated, and young Israeli person living in the comparably dry Negev desert would. To suffer from hunger is not (only) due to adverse natural causes, but is triggered by human agency (Collet, 2012) – these include policy decisions and regulations, but also historical inequalities such as colonial and postcolonial heritages. Social inequality, colonialism and imperial lifestyles amplify serious and life-threatening consequences of climate change, and climate policies (Bohnenberger and Fritz, 2021).

The following variables are critical for understanding vulnerability in the context of climate change and climate policies. While not all of them might have the same level of effect, they often overlap with each other, thus increasing overall vulnerabilities.

- **Gender and Sexual Identity:**

Gender has a considerable influence on vulnerability, and heavily interacts with other variables. Because women tend to do more unpaid care work and less paid work than cis men, they also have less time and income than men. They are therefore limited in their emotional coping capacities and social agency. However, political measures to address adverse effects of climate change do not usually integrate the precarious situations faced by people with caregiving responsibilities (Gutschow et al., 2021; MacGregor et al., 2022) Other factors to consider include the lack of access or control over basic resources that female-headed individuals often experience, significantly limiting their ability to cope with the impacts of environmental disasters (Denton, 2002; Sultana, 2014). For instance, a study in Bangladesh that examined immediate as well as long-term impacts of Cyclone Ayla in 2009 found that due to unequal gender roles, women were often not allowed or able to participate in NGO trainings or income generating activities (Thomas et al., 2019). Women may also be prohibited from traveling without male chaperones for religious or cultural reasons, which can lead to devastating consequences when floodwaters rise (Crate and Nuttall, 2016; Sultana, 2014). This highlights that vulnerability needs to be thought of intersectional and thus, for example, gender needs to be considered in its relation to cultural origin, race and class (Thomas et al., 2019). Age, health, and location also have a multiplying impact on the variable gender. For instance, women, non-binary people and Trans people tend to have less insurance cover against natural disasters than cis men. Elderly women, especially widowed and retired women, suffer more from poverty than men (Gaard, 2015a; Reid and Swiderska, 2015; Zong et al., 2022), allowing them less room of maneuver for adaptations such as new heating systems etc. Trans people, as well as cis women, often experience either transphobic and/or sexist discrimination. This decreases mental health, and emotional and cognitive capacities to cope with changes in daily routines (Gabriel, 2017; Gay-Antaki, 2020; Herbert et al., 2022; Lenz, 2020; Vinyeta et al., 2016).

In a similar way, queer and LGBTQ people experience discrimination on multiple levels which magnifies the effect of climate change and climate policies (Bauman, 2015; Gabriel, 2017; Hall, 2014).

- **Health problems/ disabilities:**

Poor health conditions are an important predictor for vulnerability to climate change and climate policies. For instance, people of bad health e.g. suffering from cardiovascular, asthmatic or respiratory diseases heavily suffer from heat waves, air pollution and similar phenomena (Poole et al., 2019). Another research on disability and so-called 'natural disasters' shows that disabled people are especially prone to harmful disasters (Kosanic et al., 2022) because of sensory disabilities, the inability to reach shelters without barriers, lack of accessibility, suitable bathrooms, or medical support. In addition, disabled people have less access to social networks, and are less likely to receive information or warnings in case of extreme events. Health also interacts with other variables. For instance, health and poverty are often interconnected. People with low income are more prone to bad housing conditions and have less availability of green outdoor spaces. This makes them more susceptible to climate change (Breil et al., 2018). Gender also plays a role. Women and girls often take care of sick or injured people, which impacts their education, job opportunities as well as their income and increases the risk to get sick as well (Otto et al., 2017).

- **Age:**

Global warming heavily impacts people of over 60, or over 80 (Costello et al., 2009). Elderly people suffer from diseases and reduced mobility. The mortality rate increases by 2.5% for every degree above 20 degrees for people over 65 years. On the other end of the scale, the mortality rate of children under the age of 15 increases by 2.6% (Gouveia et al., 2003; Otto et al., 2017). Heat waves, and other weather changes thus affect elderly people and children significantly stronger than young adults (Harvey et al., 2019; Meurer et al., 2018; Zong et al., 2022). The intersection of age and gender is also important, since women have a lesser heat tolerance than men. This results in a higher risk for women and especially elderly women to die due to heat phenomena (Otto et al., 2017).

- **Low income/ poverty:**

Poverty plays a crucial role in respect to climate-induced vulnerabilities. For instance, poor people often cannot afford good housing and/or air-cooling. Their lodgings are often far away from green spaces. All this increases the risk of heat related mortality. (Otto et al., 2017) People with low income often reside in locations, that are not resistant to climate hazards such as earthquakes, floodings etc. In addition, the damage after natural disasters is often worse for poor people since they are unable to sufficiently repair

damages, as they have fewer resources and have a lower adaptive capacity than socio-economically well-off people (Breil et al., 2018; Hallegatte et al., 2018). Also, living in poverty means residing in unsafe areas with high crime rates. This might influence the behavior of the residents during natural disasters, since they might not want to leave their home and evacuate because of fear of looters (Breil et al., 2018). More broadly speaking it can also be argued, that poor people lack the social networks and resources that more accomplished people of higher socio-economic status have. Drawing upon the term of social capital by Pierre Bourdieu (Bourdieu, 2012) it has thus been argued that poor people with less social capital are more vulnerable to climate change and climate policies than others. Poor people are heavily affected by climate change, but have traditionally not been included in the decision-making process on how to alter it (Costello et al., 2009) due to limited access to tangible and intangible resources, and unbalanced power dynamics.

- **Migration background:**

People with migration biographies and/or experience of racism face multiple structural limitations which lead to precarity, lack of financial stability etc., and thus higher vulnerability to climate change risks. Also, people with differing cultural background might find it hard to adapt to new ways of behavior and/or lifestyles (e.g. regarding energy consumption, food habits etc.) (Gutschow et al., 2021; Piguet et al., 2011; Sealey-Huggins, 2018). In addition, migrants sometimes do not master the language of their host country. Thus, they might not receive or understand information about a possible threat or where to get support in case of need. They lack essential information on climate change and/or climate policies, resulting in multiple exclusions from resources and knowledge, which is possibly life-threatening (Breil et al., 2018; Nerlich et al., 2010; Piguet et al., 2011). Language on climate change is often highly technical and standardized. Understanding it can be hampered by factors such as migration, but also for example low levels of education, age and gender (Hamilton, 2011; Schanes et al., 2016; Shepardson et al., 2012).

As the above summary shows, vulnerable people are severely affected by climate change. However, these people are also those with the least influence on policies aimed at mitigating and/or adapting to climate change. To rectify this shortcoming, researchers argue for the need to directly address and include the perspectives and voices of such groups (Kaijser and Kronsell, 2014). Recommendations for a “people’s perspective” (Denton, 2002) on climate change and climate policies thus calls for...

- An intersectional analysis of vulnerabilities: The design and drafting of policies to address climate change impacts should integrate, adapt, and

streamline the needs of vulnerable groups and precarious communities (Breil et al., 2018).

- An integration of fairness/ justice considerations: Fair climate policies (for instance fair energy policies) should consider social capabilities and structural (in)flexibilities (James et al., 2022) of certain groups of people. Besides, climate policies sensible to vulnerabilities would require an overall fair (re)distribution of resources, goods, and services.
- Non-discriminatory decision-making processes (James et al., 2022): Not only have the needs of vulnerable groups been left outside of policymaking, but also have they rarely been (directly) involved in decision-making processes. Attention should be paid to non-discriminatory way to include vulnerable groups in political decision-making and/or policy implementation.

In summary, vulnerable groups are affected by both climate change and climate change mitigation and/or adaptation measures. Impacts may be experienced at a deeply personal level. However, they have an important structural component: sociopolitical and economic contexts mediate how impacts are experienced, and by whom. As discussed earlier, people who fall within more than one category of vulnerability, and are thus exposed to intersectional vulnerabilities, are even more susceptible to climate risks than others. Thus, with a view to our previous discussion of low-carbon lifestyles and the likelihood with which they could be adapted (see chapter 3 above), we must conclude that vulnerable groups are not only the most affected by climate change, but also have the least latitude to change their actual daily routines and lifestyles. So, even if policy makers would push for change, the most vulnerable and affected members of our societies would not necessarily be able and/ or know how to follow head.

5. Empirical Survey – Q Method

The primary objective of this survey is to examine the perceptions of climate change, its severity and identify the activities that contribute to it, while exploring the attitudes towards low-carbon behaviors in three different focus cities/regions: Barcelona, metropolitan area Gdansk-Gdynia-Sopot, Vienna. These three cities/regions were chosen based on their varying geographic conditions and proneness to climate change, as well as their comparability in terms of political systems and economic development. To cater to each region, specific language versions were produced, including a German study in Vienna and its surrounding regions, a Polish study in the metropolitan area Gdansk-Gdynia-Sopot, and two language versions, Spanish and Catalan, in the Barcelona region. Given that work package 6.1. focusses on the specific viewpoints of socially vulnerable groups, small sample sizes with targeted groups were used to obtain more meaningful

insights than a representative empirical study (Watts and Stenner 2012). Given the limited number of participants in the surveys (see the results from the analysis in chapter six, from p. 28 below) the findings are thus not generalizable to the whole population. Briefly put, the sample is not intended to be statistically representative but only diverse enough to cover the diversity of the studied social universe.

The online survey was designed based on Q-methodology and incorporated statements on the social vulnerability of different groups of citizens in face of climate change. Q is a mixed or semi-qualitative method that combines a quantitative analysis of data and a qualitative interpretation process (Ramlo 2011). Q-methodology is a useful tool, which generates insights on the subjective perceptions and attitudes of individuals (Webler et al. 2009; Zabala 2014, see Mehleb et al., 2021 for a recent example) and the spectrum of subjectivity within a group of people (McKeown and Thomas 2013). It allows for an analysis of human subjectivity in a systematic and organized manner (Barry and Proops 1999). It is suitable for exploratory studies and small sample size requirement (Zabala 2014). Drawing on a “concourse”, which represents as many different statements surrounding a topic as possible, every participant can express their subjective perspective on the given topic by ranking the provided statements to their subjective perspectives. Additionally, the Q-grid design, which follows a normal distribution pattern, forces participants to make difficult choices, reducing the risk of socially desirable, politically right, or conventional answers. Through statistical analysis, similarities and differences in the individual sorting are identified (Brown 1980; Ramlo 2016) and used to objectively group thought groups based on the subjective data provided. Finally, the collective viewpoints are then interpreted in consideration of the socio-demographic background of participants, as well as the relevant scientific literature.

5.1. Using the Q-Methodology

The process of Q methodology usually follows eight steps (Hofbauer 2022; McKeown and Thomas 2013):

1. Concourse
2. Q-Sample
3. Q-Grid
4. P-Set
5. Q-Sorting
6. Quantitative Analysis
7. Qualitative Analysis
8. Interpretation

The term *concourse* refers to comprehensive and representative collection of all relevant discourses and surrounding opinions on a specific subject (Brown 1993). In constructing the concourse for this study, various sources were included, namely, newspapers, policies documents, relevant city-specific activities, scientific literature, interviews, and conversations with experts. To ensure that the statements were balanced, five key dimensions were identified based on consultation with consortium members and planned research tasks of the LOCALISED project:

- a) Lifestyle: to integrate findings from desk research, presented above
- b) Climate change opinions: as a key topic for the project
- c) Policies: evaluation of policies will feed into the Decarbonization Profiler
- d) Vulnerability: as a topic of Task 6.2
- e) Business: to provide feedback for work package 7

The *Q-sample* was designed based on these dimensions. The Q-sample consists of a set of statements related to each dimension as identified in the concourse of communication (see above). The aim was to represent a wide range of opinions and aptitudes so that each participant could express their viewpoint (Brown 1993; Ramlo 2016). For this study, thirty-six statements were used for each selected focus region, with thirty statements designed as “general statements” employed across all selected regions. Two examples of the general statements are provided below (square brackets indicate the associated dimension and were not shown to participants):

“I would go for private car ownership if the access to more services (not to work) like kindergarten, culture, health, etc... would be in walking distance.” [Lifestyle]

“I am not heavily affected by climate change, but I can see that poor or elderly people are.” [Vulnerability]

In addition to the thirty general statements, six specific statements were designed for each of the three focus regions: Barcelona, metropolitan area Gdansk-Gdynia-Sopot, Vienna. This approach was taken to meaningfully address the different climate change impacts in each selected focus region. For example, rising sea levels are not relevant for cities that are not located by the sea (Barcelona vs.

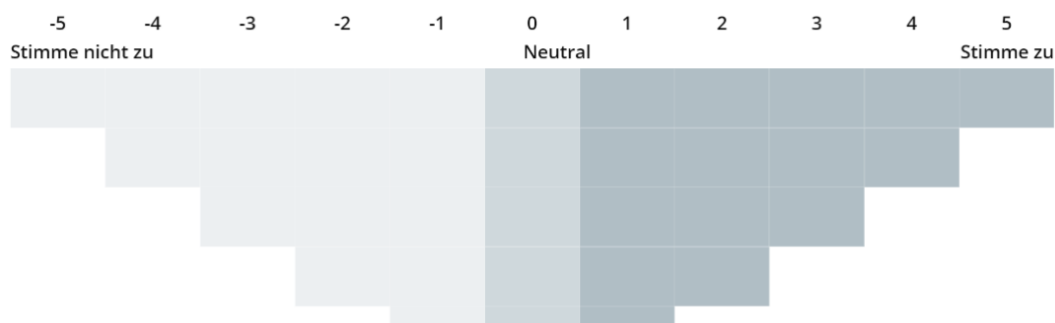


Figure 3: The Q-Grid as used in the German version.
The scale ranges from -5 (totally disagree) to +5 (totally agree).

Vienna). Furthermore, the statements were translated into the four languages widely used in the focus regions (German, Polish, Spanish, and Catalan) to make them easily accessible for all participants. The “Q-Grid” was used to sort each statement according to the individual agreement or disagreement. In this study, a Q-grid ranging from -5 (don’t agree) to +5 (totally agree) was utilized.

The *P-set* refers to the set of participants who conduct the Q-sort. To distinguish between different viewpoints, it should include participants with diverse backgrounds and attitudes (Watts and Stenner 2012). In this study, particular attention was paid to include the identified socially vulnerable groups (associated vulnerability factors indicated in brackets):

- elderly people (age)
- low income (poverty)
- physical and mental health problems and/or disabilities (health)
- women and trans/intersex people (gender)
- care responsibilities (gender)
- queer and LGBTQ people (sexual orientation)
- migration/experience of racial discriminations (migration background)
- inability to understand the language of the focus city/region (migration)
- lack of ability to understand technical language (migration background/non-technical or low educational attainment).

Further information about the socially vulnerable groups identified in this study can be found in the chapter on vulnerability and vulnerable groups (from page 17 above). To determine whether the participants of our study are disadvantaged or potentially belong to vulnerable groups, we gathered relevant data on their socio-demographic background.

Once the initial four aforementioned steps have been completed, the process of data collection, which is referred to as the *Q-Sort* begins. During the Q-sorting process, participants are required to sort the statements into the Q-grid according to the degree of individual agreement or disagreement, with each statement being ranked from -5 to +5. For this study we used the online tool “Q Method Software”.³

After the completion of the Q-sorting process, the collected data is subjected to a *quantitative analysis*, which involves several sub-processes. The first step in this analysis is the multivariate data reduction, meaning a correlation matrix between the different Q-sorts is produced (Zabala 2014). The resulting matrix is then reduced into different factors which describe multiple Q-sorts. For this study, a principal component analysis (PCA) was applied. The subsequent step involves choosing a meaningful number of factors, which is guided by a set of indicators such as the scree plot, the Kaiser-Guttman Criterion, the Humphrey’s rule, and a parallel analysis. Details on the specific indicators used for each study in German,

³ <https://app.qmethodsoftware.com/>

Polish, Spanish, and Catalan are elaborated below. The quantitative analysis entails a second step, flagging of Q-sorts, to define more distinguishable perspectives (Zabala 2014). The z- and factor scores are then calculated to determine the relationship between each factor and all statements. Lastly, distinguishing and consensus statements are identified in order to gain a deeper understanding of the identified perspectives (Zabala 2014).

After the quantitative analysis, the resulting factors can be *qualitatively interpreted* as they represent hypothetical Q-sorts, which can be seen as a fictional perspective that is based on and explains multiple real Q-sorts. Narratives for each perspective are developed to describe each perspective. For this process, the distinguishing statements are most important, but also the statements with highest (dis-) agreement are relevant (Zabala 2014).

5.2. Challenges met in the Q Survey

Q-methodology is a robust tool for assessing and analyzing perspectives and attitudes of individuals and groups. To account for the complexity that emerges from the large scope of opinions and attitudes that must be included, it was necessary to conduct extensive research prior to the study (resulting in the concourse as described above). The development of meaningful statements was made possible by incorporating several feedback loops, including input from the project partners and representatives from the three focus regions. These feedback loops facilitated the design of statements that comprised:

- Both generic statements and region-specific statements for each focus city;
- Easy-to-understand statements;
- One topic (content-wise) per statement;
- Statements with as little negations as possible; and
- Statements covering extreme opinions (to make the Q-sorts distinguishable).

To reach a diverse set of participants, we pursued two courses of action: on the one hand, the study was disseminated to a wide audience to cover the more mainstream participants. On the other hand, specific institutions, such as queer student associations, local neighborhood centers, NGOs working with migrants, and more, were contacted directly with the aim of reaching out to individuals from the identified socially vulnerable groups as elaborated above. For instance, we visited a neighborhood center in Vienna to conduct offline interviews with elderly people and migrants specifically. Lastly, it should be noted that the design of four distinct Q-samples, each with specific statements tailored to the focus region, necessitated independent analyses of the four studies, without the option of combining Q-sorts from the different focus regions. In comparison to other multi-country Q-studies that used the same set of statements in different countries

(Jeffares and Skelcher, 2011), the approach taken in this study was more complex on the one side, but also allowed for a stronger emphasis on the differences between the three focus cities/regions.

6. Perspectives of Citizens

In this chapter, we present the findings from our empirical survey. Our main objective was to gain insights into the perceptions of citizens, especially vulnerable groups, regarding climate change, as well as their attitudes towards low-carbon lifestyle changes across the three different but sufficiently comparable cities/regions. For each surveyed location, we provide a thorough analysis of the perspectives or group narratives found in the data. Firstly, we will discuss our findings based on the German version of the survey executed in Vienna and its surrounding region, followed by summaries of the findings from the other three regions. The full interpretations with references to individual survey statements and the description of the sample date are included in the Annex. It is worth noting that we analyzed the results of every narrative by embedding the perspectives in the context of social vulnerability. Finally, we conclude this chapter by comparing the findings from all three locations (and four language versions) and demonstrate how they relate to the overall insights from the preceding chapters on social vulnerability and lifestyles.

6.1. *Results from the Vienna Survey*

In the German survey conducted in Vienna and its surrounding region, we identified three distinct perspectives or group narratives. These three perspectives were labeled as: (1) the social perspective, (2) the technological perspective and (3) the self-centered perspective.

1. Narrative 1: "Social perspective"

The first identified narrative, the social perspective, is characterized by a strong emphasis on the social aspects of climate change. The group heavily agrees with the statement (V6) asserting that the consumption of resources by "big climate sinners" is also a social issue. The participants of this perspective believe that integrating gender-related aspects into climate politics would benefit everyone in society (statement V3). Women and girls (statement 21), as well as low-income people, homeless people, and those with health problems (statement 9), are viewed as vulnerable groups that need protection through climate policies. Another notable aspect of this perspective is the criticism directed at social groups that are

less vulnerable. For instance, the top earners are seen as the group that should bear the brunt of climate change measures instead of the working- or middle-class people (statement 25). Participants holding the social perspective view actual measures to address climate change as of subordinate importance: They consider the existence of green infrastructure to be crucial (statement 16), and do not regard technology and innovation as the primary solutions to the climate crisis (statement 23). This group does not see climate crisis as a “purely technological question,” and holds a more nuanced view of individual capacities to implement behavioral changes (participant 1DNP). Participants also recognize the challenge of striking a balance between “social and individual decisions” (participant NVIZ) and “social against environmental concerns” (participant R6YF). The responsibility for climate action is clearly perceived to lie with higher-level entities, such as businesses that “have to do more!” (participant EOE2) or “[...]governments that take on responsibility” (participant NVIZ). Regarding the sample behind the first perspective, it is noteworthy that participants share several vulnerabilities, with the highest number of trans, non-binary and queer individuals. Additionally, only a small proportion of them have care responsibilities. At the same time, this group also has the highest mean income and education rate, and self-identify as politically left or left-leaning. In summary, while this narrative is associated with the most vulnerable people, these individuals still have a relatively high education and a mean income of 2.000€ per month.⁴

2. Narrative 2: “Technological perspective”

The second perspective places a strong focus on technical and behavioral climate measures, such as building insulation (statement 30), food sharing (statement 7), and reducing air travel (statement 2). Participants who hold this perspective also highlight the urgency of implementing climate measures, emphasizing that local and regional actors must act now without waiting for international regulations (statement 14). Furthermore, they believe that climate measures must be implemented proactively, *before* the demand for them arises (statement 5). In their view, climate measures should also be implemented even if businesses and economists object to them (statement 13). On the other hand, participants of this perspectives do not see the necessity of including social aspects related to vulnerability, such as women and girls (statement 21), low-income people, homeless people, and those with health problems (statement 9), in climate policies. They clearly reject the idea of imposing stronger taxes on climate-damaging behavior of “wealthy people” (statement 25) and do not perceive a social issue arising from the consumption patterns of “big climate sinners” (statement V6). In their view, everybody must contribute to climate mitigation, including more vulnerable groups. While proponents of this perspective mostly focus on concrete climate actions, they neglect statements regarding social issues and socially

⁴ In 2020, the mean yearly net income in Vienna was 24.401€ (Statistisches Jahrbuch, 2022, p. 151))

vulnerable groups, even stating that they have difficulties to sort statements about those groups (participant FJWI, 2O7F). One participant stated, "I had difficulties sorting the three statements regarding women and [...]gender and to put them into context of climate change" (participant 6D2G). This narrative focuses on climate actions that are straightforward and easier for the participants to assess, such as using public transportation (participant 2O7F), waste separation and regional climate neutrality (participant 0Z22), as well as insulation (participant 6D2G). Gender-related issues are particularly viewed as out of place: "Including gender issues into this isn't the right approach - it obviously has nothing to do with the debate" (participant EGQJ). In general, the participants behind perspective 2 do not differentiate the responsibility of different social groups (participant 0Z22), as they believe "climate change affects everyone, regardless of origin, religion or gender" (participant EGQJ). It is worth mentioning that the participants are subject to vulnerabilities themselves. For instance, the majority of them have care responsibilities, a diverse educational level and background, and include people who live on an income as low as 1.300€ per month. Furthermore, this perspective is distinguished by a high representation of people over 60 years old and a diverse sample in terms of gender and education level and background.

3. Narrative 3: "Self-centered perspective"

The third perspective is characterized by a distinct attitude towards climate policies. On the one hand, it is believed that wealthy people have a greater more responsibility for implementing climate measures than less fortunate citizens (statement 25), and the consumption of resources of "climate sinners" is perceived as a social issue (statement V6). On the other hand, the participants are strongly opposed to strict legislation that mandates the use of photovoltaics for everyone (statement 17), and are only willing to accept restrictive climate policies if they do not come with personal disadvantages. For example, they willingly give up their car, but only if everyday services are located within walking distance (statement 29). In addition, economic aspects of climate policies are emphasized more strongly, and the development of new local production is highly supported, as it is beneficial for the economy and reducing vulnerabilities (statement 28, see Annex). The participants rely on technological innovation in order to "solve the climate crisis" with high effectiveness and low costs (statement 23, see Annex). However, climate measures such as protecting green infrastructures in the city (statement 6) or reducing meat consumption and animal products for health reasons (statement 28) are seen as much less important. One participant states: "I don't want to change my diet because of climate change. Bigger measures are needed[...]" (participant 4Z4F). While this perspective does not put social issues into the spotlight, participants appear surprised by some facts included in the statements: "I was surprised that so many women worldwide are affected. How is it in Europe?" (participant 4Z4F). Therefore, they found it difficult to sort statements on social vulnerability (participant LOBN). Individualists prioritize individual climate policies and, while they may not be fully aware of the

vulnerabilities of certain groups, they are open to including some social aspects in their perspective. Most of the participants share a comparatively low level of education and a low interest in politics. This is a crucial vulnerability, since they lack essential information to evaluate what might be relevant or not. In terms of gender, they all identify themselves as cisgender and binary. Lastly, none of the participants with this perspective owns a home, which might put them at risk in terms of vulnerability, because owners might not have an interest to repair and/or adapt the homes to the latest standards, if they rent them out.

Relating the perspectives to vulnerability

The findings of the German study (in form of the three different perspectives presented above) indicate that intersectional vulnerabilities have an impact on the individual perspectives on climate change policies. The participants of the “social perspective” (narrative 1) are affected by a total of 14 different vulnerabilities, with 85% identifying as cis female or non-binary, and six participants identifying as trans and/or queer (refer to Annex, Table A5). Being subject to intersectional vulnerabilities (Kosanic et al., 2022), specifically those related to gender and one or more additional vulnerabilities, has multiple impacts on the individual perspectives on climate change policies.

On the one hand, the social consequences of climate-damaging behavior of financially privileged people (Breil et al., 2018; Collet, 2012) are strongly emphasized. On the other hand, participants sharing this perspective demand the integration and protection of vulnerable groups in and by climate policies. Accordingly, these participants show greater acceptance for climate policies that consider vulnerable group perspectives and hold financially privileged people responsible.

Participants of the “technological perspective” (narrative 2) are also subject to eight different vulnerabilities, but there is a smaller proportion of women, trans, and non-binary people (35%). Consequently, a lower proportion of participants is affected by intersectional vulnerability. Their perspective is centered around the belief that climate change policies should mainly rely on technical solutions and not serve as a means of protecting vulnerable groups. Social vulnerability and other social aspects are not considered significant parts of meaningful climate change policies. As a result, participants of this perspective exhibit greater acceptance toward technical and technological climate change measures and reject the integration of vulnerability-related aspects in climate change policies.

Due to the small sample size of only four participants in the “Self-centered perspective” (narrative 3), a meaningful comparison to perspectives one and two is not feasible. Nonetheless, this perspective provides insight to a different attitude toward low-carbon lifestyle changes. Participants aligned with the self-centered perspective are open to climate change policies, but only to the extent that they do not negatively interfere with their daily routines or generate any consequences

for themselves. Accordingly, they advocate for climate change policies that are based on voluntary basis and deny restrictive policies.

6.2. Results from the Catalan and Spanish Survey

The Catalan and Spanish language versions were both intended for the Barcelona region and both contained the same concourse of statements. Hence, we will first give an account of the narratives individually, and then we will examine their relation to the concept of vulnerability together.

Perspectives of the Catalan Study

1. Narrative 1: "Contradictory perspective"

Perspective 1 is characterized by several contradictions. Firstly, participants of this perspective want to protect the less wealthy working-class neighborhoods (statement B2) and promote civic participation (statement 24). However, at the same time, they hold everybody accountable and emphasize that each person can contribute to climate mitigation individually (statement 6). Secondly, while they expect everybody to contribute to climate mitigation, participants of this perspective do not consider their own motivation to do so. On the contrary, they would only consider giving up driving if it does not result in disadvantages (statement 29) or would not change their diet to reduce their climate impact (statement 1). Lastly, they rely on local production (statement 20) without taking the needs of businesses in climate policies into account (statement 27).

2. Narrative 2: "Top-down Transition perspective"

The second perspective places great importance on superordinate global climate policies and mandatory measures, yet simultaneously, the participants do not intend to change their own behavior. On the one hand, they promote the necessity of global measures (statement 13) and support the implementation of mandatory policies that apply to everybody, such as installing photovoltaic panels on every roof where feasible (statement 17). On the other hand, they do not take responsibility themselves and are unwilling to give up their comfort, such as car ownership, even if everyday activities would be in walking distance (statement 29). They rely on top-down policies and do not believe individuals should be accountable for climate mitigation or adaptation (statement 15).

Perspectives of the Spanish Study

1. Narrative 1: "Local Change perspective"

Perspective 1 has a strong emphasis on local policies and in consideration of and for the local population. They advocate for the protection of working-class neighborhoods (statement B2) and promote local actions (statement 14) to be

taken immediately (statement 5). They do not consider economic interests of corporations (statement 13; statement 27) in climate policies and instead aim for fundamental goals such as a transformation of the productive model (statement B4), which they believe is the primary cause of the current climate crisis: “I am convinced that the model in which we live is the cause of climate change and it is urgent to change it as soon as possible, here and in every city in the world” (participant 4UKM). Additionally, they support smaller efforts, such as giving up air travel (statement 2). When it comes to climate adaptation, there is less awareness present. For instance, green spaces are not seen as worthy of protection (statement 6).

2. Narrative 2: “Climate Inactivism perspective”

The second perspective is characterized by an overall low level of motivation and acceptance towards climate policies. Participants do not consider giving up flying as a meaningful measure (statement 2) and are unwilling to change their diet for the purpose of climate mitigation (statement 1). Moreover, they do not believe in changing their car use behavior (statement 29) or for instance, using public transport more widely (statement 3). In their view, climate policies should only be implemented if there is already an acceptance or demand by and from inhabitants (statement 5). Citizen participation is not deemed as a meaningful way of finding solutions for the climate crisis (statement 24).

Relating both Perspectives to Vulnerability

Because the same Q-sample has been used for the Spanish and Catalan survey, the perspectives will be analyzed together in this section. Participants of the “contradictory perspective” (narrative 1, Catalan survey) and the “local change perspective” (narrative 1, Spanish survey) have both a comparable low income (mean of 1.750€) and focus on the vulnerability of the less wealthy working-class districts. It is worth mentioning that this statement was chosen specifically for the case of Barcelona. Since in both perspectives, awareness is only visible for this vulnerable group (and no other vulnerable group takes a central role in their perspective), the fact of being affected by low income seems to increase their awareness of this topic. This indicates that participants of both perspectives mainly focus on vulnerabilities that they can relate to and perceive as relevant for climate change policies. In contrast, women and children (Gaard, 2015b) are not perceived as a vulnerable group in regard to climate change, even though almost all participants are female (five out of six in the “contradictory perspective” and one out of two in the “local change perspective”). This demonstrates that in the face of climate change and its policies, income/wealth (Reid and Swiderska, 2015) is a more relevant vulnerability than gender-related vulnerabilities (MacGregor et al., 2022). Lastly, both perspectives favor climate change policies that focus on economic aspects and have a local relevance.

Participants of the “top-down transition perspective” (narrative 2, Catalan survey) are affected by issues such as migration/racism and care work, yet these personal experiences do not seem to be reflected in their perspective on climate change policies, and no vulnerable group takes a central role in their narrative. They prefer climate change policies that operate at a higher spatial and political (global) level, favoring top-down enforcement over individual commitment due to its greater effectiveness. However, they are open to mandatory policies that have a higher impact by being relevant on a wider scale rather than solely focusing on individuals.

In contrast, participants of the “climate inactivism perspective” (narrative 2, Spanish survey) tend to reject most forms of climate change policies. This perspective does not appear to be connected with their personal backgrounds; both participants are affected by vulnerabilities (one has care responsibilities, and the other is impacted by migration/racism), and their socio-demographic background does not suggest any specific financial or social privilege (Breil et al., 2018; Collet, 2012). Despite their overall low acceptance of climate change policies, they seem to be more open to policies that are associated with an existing demand, such as building bike lanes if there is demand for them.

6.3. Results from the Gdansk-Gdynia-Sopot Survey

The Polish version of the survey was conducted in the Gdansk-Gdynia-Sopot Metropolitan Area. Two group narratives were identified as significant perspectives on climate change and climate policies, including lifestyle changes.

1. Narrative 1: “Participatory perspective”

Participants of the first perspective have a social orientation and emphasize the importance of civic participation in climate policy (statement 24). They prefer policies that “support citizenship, localism and the actions of each person” (participant OMVY). Moreover, they promote the protection of women, girls (statement 21), and other vulnerable groups (statement 9) through climate policies. This aspect accounts for the diverse living conditions that enable or limit individuals’ capacities to adopt climate-friendly behavior. For instance, when confronted with the statement about giving up car ownership if entertainment and shopping infrastructure were available in the area where one lives, one participant notes, “I would like to add [...] and it also depends[...]" [some.g. statement 29] as owning a car is dependent on work and/or family factors, such as caring for aging parents. I would give up a private car if there were an available and inexpensive ad hoc car rental service for such needs.”

Furthermore, the participants strongly disagree with taking the needs of companies into account when it comes to climate policies (statement 27). In their

view, there is a “hierarchy of responsibility”, pointing to the need to hold businesses and governments accountable (participant OVMY).

When it comes to the impacts of climate change, the participants believe they are already experiencing the effects. They do not perceive the heavy downpours in their region to be a natural climate variability (statement G6) but as a “result of a climate catastrophe” (participant 9SYG). From their perspective, climate policies should be implemented now, even if the demand for them does not currently exist (statement 5).

2. Narrative 2: “Neoliberalist perspective”

Participants of this narrative promote a neoliberal approach, which holds individuals responsible for climate policies and highlights the necessity of everyday changes (statement G2). They are willing to take action themselves, such as repairing devices rather than discarding them (statement 26), and support technological and innovation solutions for the climate crisis (statement 23). The participants wish the needs of corporations to be considered in climate policies (statement 27), reflecting their neoliberal perspective (statement 25). This narrative is further emphasized where they argue that the working- and middle-class people should not be exempt from climate policies, and wealthy people are not deemed as more responsible. Nonetheless, they reject strict climate measures, such as a ban on demolishing green infrastructures for the purpose of building and development (statement 6).

6.4. Analysis of the Empirical Findings

The four Q surveys provide invaluable insights into the different perspectives on climate change policies and low-carbon lifestyle changes that exist within the selected focus regions. Since our aim was to achieve a thick description of group discourses (attitudes, opinions) our study has limited potential for generalization. Hence why the comparably low number of participants in the study were not problematic. Despite this, a comparison shows some similarities and dissimilarities across the regions. For instance, gender-related issues are only included as a central element in one perspective in the German survey, known as the “social perspective”. Moreover, in both the German and Polish surveys, one perspective primarily draws on the importance of considering multiple vulnerabilities, such as women, girls and other vulnerable groups, in climate policies.

In contrast, the Spanish and Catalan surveys lack this kind of perspective, and the focus on the mentioned vulnerable groups is not central to any perspective. Instead, both studies contain a perspective that highlights the vulnerability of working-class neighborhoods and the local relevance of climate change policies. This emphasis is most clearly observed in the perspectives known as the “local

change perspective” in the Spanish survey and the “contradictory perspective” in the Catalan survey.

While the perspectives in the German survey differ significantly in terms of considering or protecting vulnerable groups in climate change policies (i.e., the “social perspective” versus the “technological perspective”), the two perspectives in the Spanish survey show a stark contrast in overall willingness to adopt low-carbon lifestyle changes. The “local change perspective” specifically aims for more fundamental changes and thus exhibits a high willingness to implement low-carbon lifestyles, such as altering the productive model. On the other hand, the “climate inactivism perspective” generally demonstrates an extremely low motivation for climate change policies.

Contrastingly, the Catalan survey reveals few differences between the perspectives. Both narratives prioritize more subordinated policies and deem everybody responsible. However, both perspectives are also characterized by conflicting elements. What is considered necessary climate policy on one hand is not seen as an acceptable low-carbon lifestyle change on a personal levels.

One common similarity found in all four surveys is the occurrence of a perspective that mainly promotes the individual responsibility while neglecting the diverse capacities of more vulnerable groups (perspective 3 in the German survey; perspective 2 in the Polish survey; perspective 2 in the Catalan survey; perspective 2 in the Spanish survey). Participants of these perspectives may not be cognizant of these disparities or may perceive everyone as equally responsible regardless of their situation. Consequently, individuals holding this perspective are more inclined towards climate change policies that affect everybody equally, without relying on individual financial or social privileges, disadvantages or vulnerability risks. Nevertheless, if awareness about the impacts and implications of climate change policies on vulnerable groups is heightened, participants of these perspectives may alter their stance and consider individual capacities concerning low-carbon lifestyle changes.

The findings of the survey suggest that experiencing vulnerabilities can influence the personal perspectives on climate change policies and receptiveness to low-carbon lifestyle changes. There seems to be an increased awareness for the social dimension of climate change among those that are more diverse. We can see a relationship between exposure to vulnerabilities and perspectives on social and structural implications of climate change policies. However, the study also highlights the intricate nature of intersectional vulnerabilities. Notably, not all participants subject to vulnerabilities share similar perspectives, but instead exhibit divergent and opposing perspectives. This underscores the idea that being affected by vulnerabilities is just *one* of multiple factors influencing the experiences and perspectives on climate change policies and low-carbon lifestyle changes. These factors may include socio-demographic indicators such as level of education,

financial stability, and political beliefs. Although political orientation was not found to be a central factor in this survey, low-income emerged as a key factor that increased awareness of the vulnerability of working-class neighborhoods in both the Spanish and Catalan study.

To summarize, our results suggest that citizens who experience intersectional vulnerabilities are more receptive towards climate change policies that prioritize the protection of diverse groups of vulnerable people. Subsequently, the acceptance and adoption of low-carbon lifestyles is higher among them and perceived as appropriate. In contrast, citizens who are less affected by (intersectional) vulnerabilities tend to favor low-carbon lifestyle changes that are equally applicable to everyone and reject climate change policies that consider individual life circumstances.

This effect is most pronounced in perspectives with a high percentage of female and/or non-binary participants affected by multiple intersecting vulnerabilities. The presence of intersectional vulnerabilities has been shown to increase acceptance of climate change policies that safeguard or account for vulnerable groups. Furthermore, it leads to a heightened awareness of different needs and diverse capacities for low-carbon lifestyle changes and demands for more tailored and appropriate policies that take individual life circumstances into consideration. Among those more susceptible to be the effects of climate change, a greater consciousness for its social dimensions of climate change has been observed. Thus, the perspectives indicate a higher willingness towards climate change policies that take powerful or more privileged individuals and institutions into account.

7. Conclusion

This report investigates the potential for low-carbon lifestyles to reduce GHG emissions in the framework of an intersectional, semi-qualitative study on citizens' perspectives on climate change and climate policies. This study aims to provide a deeper insight into citizens' acceptance of key behavioral changes. In addition, the report employs theories of vulnerability to discern how different groups, especially traditionally underrepresented groups, are prone to unfair and/or socially unjust political structures and policies. Briefly put, the report assesses the feasibility of individual actions towards decarbonization to achieve international and EU climate targets.

Since GHG emissions can be attributed to behavior patterns of citizens, a shift towards low-carbon lifestyles could be expected to reduce GHG emissions. However, this report highlights how lifestyle changes are impeded by psychological

limits and structural barriers in society. First, lifestyles are deeply entrenched in value systems and beliefs; thus, citizens are unlikely to make significant changes to their way of life solely due to increased awareness of climate crises. Secondly, unequal access to societal resources, including access to education, information, and power, contributes to the inflexibility of lifestyles.

Lifestyle changes are challenging to implement, especially for vulnerable people who are traditionally excluded from participating in the crafting of political responses to climate change. As outlined in this report, vulnerable groups are most severely affected by climate change and climate policies due to shared group criteria, such as age, gender, income level, and more. Simultaneously, they face significant barriers in effecting change in policies due to their limited access to social resources and power.

Empirical findings from the Q-study survey indicate that being subject to vulnerabilities can influence one's perspective on climate change policies and openness to low-carbon lifestyle changes. This effect is most apparent in perspectives with a high proportion of female and/or non-binary participants who are affected by multiple additional vulnerabilities. The occurrence of intersectional vulnerabilities raises the acceptance of equitable climate change policies. However, not all participants who are impacted by vulnerabilities have similar perspectives; on the contrary, they have shown divergent and opposing views.

Citizens tend to be more receptive to climate change policies that aim to protect vulnerable groups, particularly if they themselves are affected by intersectional vulnerabilities. Consequently, the acceptance of low-carbon lifestyle changes is more likely among individuals who consider the diverse circumstances of individuals and such groups. In contrast, citizens unaffected by intersectional discrimination do not recognize the need to take into account vulnerabilities in low-carbon lifestyle changes. Even more, the latter may reject climate change policies that differentiate between citizens based on their personal life circumstances.

In summary, the results indicate that being affected by vulnerabilities is only *one* of multiple factors that shapes attitudes towards climate policies and low-carbon lifestyle changes. Other factors, such as socio-demographic factors like education, financial stability, and political views, may also play a significant role in influencing citizens' perspectives. Further research is necessary to fully understand the effects of such factors on citizens' perceptions and attitudes.

With view to mitigation and adaptation measures required to meet the decarbonization targets, it is essential to consider structural barriers and discriminatory factors. Failure to do so could result in resistance or evasion of such policies by some citizens, especially those most affected by climate change. Furthermore, neglecting these factors could reinforce the existing inequalities and/or lead to new inequities that disproportionately affect these groups of people.

Based on the existing literature and the conducted survey, this report recommends the following measures to rectify the inequality amongst those already most affected by climate change:

- Although low-carbon lifestyles can be described in theory, individual behavior changes alone are insufficient to meet the EU climate targets.
- Policies and measures should not be evaluated solely based on environmental and ecological metrics. Instead, an assessment of the unique circumstances of vulnerable groups in face of climate change is necessary. Specifically, it is suggested that an evaluation be conducted to identify how climate policies might adversely impact (the most) disadvantaged and vulnerable people.
- As there is insufficient information about vulnerable groups across regions, these groups should be involved in the policy-cycle through balanced and well-designed participation processes.
- Awareness-raising campaigns are not enough to bring about significant changes in key behaviors. Rather, the incremental redistribution of structural opportunities and resources is vital to alleviate the difficulties associated with adopting low-carbon lifestyles.

Finally, further research is required to examine the potential adverse effects that participatory processes might have on vulnerable groups, particularly if they are not designed with their unique circumstances in mind. Therefore, the first step in identifying just and effective regional policies should always involve researching the types and proportions of vulnerable groups in the region. This will provide necessary foundation for policy makers and consultants, as well as civil servants to develop policies, measures, and strategies that are tailored to the specific needs of these groups and do not inadvertently discriminate against them.

8. Bibliography

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9. Annex

9.1. The Final Q Surveys – Technical Data

Table A1: The 32 Final Statements for all Focus Cities/ Regions

1	I will not go vegetarian (or vegan) only to reduce the CO2 emissions.
2	To me, reducing flights is not a useful measure to reduce the CO2 emissions.
3	Public transport and trains should be the first choice if one wants to travel.
4	If we want to solve the climate crisis we cannot only rely on renewable energy.
5	The municipalities don't should not improve bicycle infrastructure as long as people don't like to bike and there is not enough space for cars. The infrastructure has to be modified as people change their behavior.
6	[Name of the city] needs to stop to build houses and streets on green areas.
7	Given the food scarcity, food waste should be reduced. Thus, our cities must invest more in food sharing possibilities.
8	Climate change is caused by greenhouse gasses, which are emitted worldwide. Therefore, all countries must reduce their emissions, no matter how they benefitted or how they are impacted.
9	It's obvious that the most vulnerable groups (low-income, homeless people, people with health issues) of our societies are those who must carry the heaviest burdens. Mitigating measures against climate change have to be measures against poverty and social exclusion.
10	I would change my diet substantially, if I knew which foods were climate friendly.
11	I am not heavily affected by climate change, but I can see that poor or elderly people are.
12	The climate crisis needs to be tackled globally. Changes of the economies are needed everywhere. But as governments seem not to be able to solve this, the citizens must consume more sustainable products. The supply will then align with the demand for greener products.
13	The international community committed to a clear climate target with the Paris Agreement (limit global warming to 1.5 degrees) and the EU decided to become climate neutral by 2050. So, all the governments should define strict measures, regardless of complaints from companies and economists.

14	We cannot wait for the international regulations when we want to mitigate climate change effects. Cities and regions need to start immediately and become role models.
15	Citizens can contribute substantially for CO2 reductions - also independently from ponderous political actions. For example: Everyone who can, should go by bike, foot, or public transport.
16	Having green spaces nearby is less important to me, than having a workplace, family members or daily shopping opportunities close to my home.
17	We must have a law to install photovoltaics on every building where feasible. I don't think people will take steps by themselves, even if they can afford it easily.
18	In the buildings sector, one of the most significant behavioral changes relates to adjusting the temperature. Lowering heating and raising cooling set points can save significant energy and carbon footprint. This is also a way I can contribute something.
19	Companies cause a large share of CO2 emissions and should therefore be transparent about them.
20	Manufacturing and production are still the most important sectors in our economy. We see that long international supply chains are very sensitive to various disruptions. We need more local production to secure our supply and jobs.
21	80 percent of the people displaced by climate-related disasters and changes worldwide are women and girls. A climate policy priority should be to empower and protect them.
22	Climate adaptation planning in our cities and regions should first and foremost be aligned with the needs of average citizens. Everyone is affected by climate change.
23	Technology and inventions are the key solutions to the climate crisis. They would not only increase our effectiveness but also reduce the costs.
24	Civic participation would make it possible to find solutions that are more effective and accepted. It should be used more intensively at all levels of policy making.
25	In the face of climate change, if rich people do not change their behaviors and are not taxed more, our efforts are just a drop in the ocean. Working class and middle-class people are not the ones that should avoid vacation flights and eating meat.
26	I'm more willing to repair a device rather than buying a new when the device reaches the end of its lifetime.
27	Measures against adverse effects of climate change must go in line with the needs of companies and the options they provide.
28	I will eat less animal products - primary this is a health issue for me. Ecologically it might be beneficial, but this is not that important for me.

29	I would forego private car ownership if the access to more services (not to work) like kindergarten, culture, health, etc... would be in walking distance.
30	Insulating houses is an efficient measure for saving CO2 emissions. More public money should be used for this.

Final Statements for the 3 Focus Cities/ Regions

Table A2: Statements for City of Barcelona and surrounding region

B1	The scarcity of materials is a crucial question in the context of the energy transition.
B2	The energy transition should not harm the (working-class) neighbourhoods.
B3	Private firms must lead the fight against climate change.
B4	The fight against climate change should be based on the transformation of our productive model.
B5	The suggested (energy) transition is based on a centralised model, far away from the consumption centres, controlled by big firms. It is a model that does not contribute to the development of municipalities and counties.
B6	Energy transition is not a question of citizen participation. It needs to be planned by experts. Partly also because the clock is ticking and we must not make any mistakes.

Table A3: Statements for Gdansk-Gdynia-Sopot Metropolitan Area

G1	A quarter of a million people in Poland will be threatened by catastrophic floods! The sea encroaching on Żuławy and cutting through the Hel Peninsula, flooding houses and streets in Gdańsk is a very real vision of the next century. The first incidents may already happen in our lifetime.
G2	The needed change begins at the level of every inhabitant. Each of us can take actions daily that will contribute to climate protection: starting with our choice of means of transport or purchasing decisions.
G3	Galloping inflation, rising food, heat and energy prices are pushing more and more families into poverty.
G4	The Pomeranian voivodeship has very good conditions for the development of renewable energy sources. I think Pomerania has the potential to achieve climate neutrality by 2040 and become a national leader in green energy production.

G5	In 2040 at latest, there should be no more coal-fired cookers in Sopot. Last year, the city replaced already 230 of the "old coals" in municipal buildings and it is also subsidizing the replacement of private homes. There should be even more support for private households to reduce their building related CO2 emissions.
G6	In the Tri-City Gdańsk, Gdynia, Sopot area, the three heaviest downpours ever recorded have occurred in the last twenty years. But the weather is changing all the time and rain is something we can cope with. Public money should rather be spent on education, tourism, or social welfare.

Table A4: Statements for City of Vienna and surrounding region

V1	Rising temperatures, more frequent extreme weather events and heat stress - the consequences of climate change are also becoming increasingly noticeable in Vienna.
V2	An essential prerequisite for managing crises is open communication and a strong culture of participation.
V3	Integrating gender considerations into climate policy is essential for climate policies to be effective for the benefit of all city residents.
V4	Through smart and compact urban planning, the City of Vienna succeeds in bringing the continuous population growth in our city into harmony with soil protection. Instead of sealing greenfield sites, we rely predominantly on areas that are already in use.
V5	More "zero waste" initiatives are needed. In Vienna, for example, 100 percent of non-avoidable waste is to be recycled by 2050. Environmental protection is important to me, and I am also personally committed to waste avoidance.
V6	At its core, it is also a social issue when the big climate sinners squander resources and the people in the city are the ones who suffer.

9.2. Samples from all Language Versions

Table A5: Sample for German Study – conducted in the City of Vienna and the surrounding region

	Narrative 1 "Social perspective"	Narrative 2 "Technical Perspective"	Narrative 3 "Self-centered Perspective"
No of participants	14	14	4
Vulnerabilities overall	8 participants with at least one vulnerability 14 different vulnerabilities: Disabilities, Health Problems, Care Responsibilities, Age, Trans/Queer, low income, Racism/Migration, and Difficulties understanding technical Terminology	6 participants with at least one vulnerability 8 different vulnerabilities in total: Disabilities, Health Problems, Care Responsibilities, Age, Trans/Queer, low income, Racism/Migration, and Difficulties understanding the spoken language of the city they live in	0 participants with at least one vulnerability
Age (20-30)			2
(30-40)	6	6	2
(40-60)	4	2	
(over 60)	4	6	
Gender	85% cis female (8) and non-	5 participants are cis female; 1	2 participants are cis female; 2

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	binary (4); 15% are cis male	participant is trans female; 8 are cis male	participants are cis male
Queer Identity	6 (trans or queer)	4 participants are trans (1) or queer (3)	
Care Responsibilities	2 (cis female)	6 participants (3 cis female, 3 cis male)	
Mean Income	2.000 €	1.300 €	1.400 €
Political Views	93% - left or rather left; 1 unpolitical	9 participants identify as left or rather left; 4 participants are unpolitical; 1 participant is rather right	2 participants identify as rather left; 2 participants are unpolitical
Education	11 graduated at university; 3 graduated from high school	7 participants graduated at university; 6 participants graduated from high school; 1 participant completed an apprenticeship	1 participant graduated at university; 2 participants graduated from high school; 1 person completed an apprenticeship

Table A6: Sample for Catalan Study – conducted in the City of Barcelona and the surrounding region

	Narrative 1 “Contradictory Perspective”	Narrative 2 “Top-down Transition Perspective”
No of participants	6	3
Vulnerabilities overall	2 participants with at least one vulnerability 2 vulnerabilities in total: Racism/Migration, Care Responsibilities	3 participants with at least one vulnerability 2 vulnerabilities in total: Racism/Migration, Care Responsibilities
Age (20-30)	2	
(30-40)	2	3
(40-60)	2	1
(over 60)		
Gender	83% are cis female (5), 17% are cis male (1)	3 participants are cis female
Queer Identity		
Care Responsibilities	1 participant (cis female)	2 participants (2 cis female)
Mean Income	1.750 €	2.250 €

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Political Views	6 participants identify as left or rather left	3 participants identify as left
Education	4 participants graduated university; 1 participant graduated high school; 1 participant completed an apprenticeship	3 participants graduated university

Table A7: Sample for Spanish Study – conducted in the City of Barcelona and the surrounding region

	Narrative 1 “Local Change Perspective”	Narrative 2 “Climate Inactivism Perspective”
No of participants	2 (only 1 provided socio-demographic data)	2
Vulnerabilities overall	0 participants with at least 1 vulnerability	2 participants with at least one vulnerability 2 vulnerabilities in total: Racism/Migration, Care Responsibilities
Age (20-30)	1	
(30-40)		1
(40-60)		1
(over 60)		
Gender	1 is cis female	1 participant is cis female; 1 is cis male

Queer Identity		
Care Responsibilities		1 participant (1 cis male)
Mean Income	1.750 €	2.500 €
Political Views	1 participant identified as rather left	2 participants identify as left
Education	1 participant graduated university	2 participants graduated university

Table A8: Sample for Polish Study – Gdansk-Gdynia-Sopot Metropolitan Area

	Narrative 1 "Participatory Perspective"	Narrative 2 "Neoliberalists Perspective"
No of participants	5	4
Vulnerabilities overall	3 people with at least one vulnerability 4 different vulnerabilities in total: Health Problems, Care Responsibilities, Trans/Queer, Gender	3 People with at least one vulnerability 3 different vulnerabilities in total: Care Responsibilities, Trans/Queer, Gender
Age (20-30)	1	

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(30-40)	3	1
(40-60)	1	3
(over 60)		
Gender	5 are cis female	1 participants is cis female; 1 participants is non-binary; 2 are cis male
Queer Identity	1 participant is queer	1 participant is queer
Care Responsibilities	2 Participants (cis female)	2 participants (2 cis female)
Mean Income	5.000 Złoty	6.500 Złoty
Political Views	4 participants identify as left or rather left; 1 participant is unpolitical	3 participants are unpolitical; 1 participant is rather right
Education	5 participants graduated at university	4 participants graduated at university



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