

D1.2

Vision document on energy citizenship-based Energy Union (persons, essays, scenarios, winners and losers of energy transitions)

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Executive summary

The overall objective of WP1 of the GRETA project is to further elaborate on the concepts and methods proposed in a detailed and harmonized manner across all WPs, to address the four major topics outlined in the call text. Specifically, WP1 aims to further enhance the current understanding on energy citizenship contributing to the energy transition by clarifying different concepts, definitions, and evolving perspectives on the subject. Task 1.2 seeks to explore the role that energy justice, both as an analytical framework and a process, plays in energy citizenship emergence. Using an Energy Justice Framework, this deliverable oversees the analysis of the multiple connections between energy justice and energy citizenship concepts and practices. The Energy Justice Framework will help to devise further effective ways of involving citizens for a just energy transition, thus leading to greater social acceptability as well as more durable governance arrangements and socio-economic benefits.

This report is divided into two main parts: *the first part* concerns the relationship of energy citizenship and energy justice; specifically, it puts together a 1.1) glossary with key definitions of energy citizenship, energy justice, energy poverty and Energy Union; it investigates 2) the multiple interconnections of energy citizenship, energy justice and the emerging Energy Union; and discusses 3) energy justice theories and forms of energy citizenship; it looks into 4) the main drivers and barriers of energy justice by focusing on the relation between energy (in)justice and involvement levels of energy citizenship; it shows 5) how EU energy policies affect energy citizenship by analysing these effects from an energy justice perspective. Building on socio-technical informed literature, this first part aims to show how energy must be reconceptualized and critically interrogated not only as a technical and economic concern but, specifically, as a *social project*. Central to this exploration is the conceptualization of energy as a crucial dimension of the foundational economy, as one of the goods and services which are the social and material infrastructure of civilized life, providing daily essentials for all households. According to this, energy raises issues of justice, that can be analytically divided into two areas of investigation, in terms of justice as a framework and in terms of justice as a process.

The *second part* goes further in examining specific dimensions of energy justice according to the literature. Based on an in-depth literature review, three main dimensions have been identified as particularly relevant to be discussed within an Energy Justice Framework: energy poverty, gender perspectives, and green energy technologies. The general aim of this part is to highlight how these three dimensions intersect and interact with energy justice principles and emerging forms of energy citizenship. This will help to visualize and put into question the complex but often unproblematized socio-political features of the energy system as well as the need to plan for a just transition towards an ecological society.

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Summary (for dissemination)	This deliverable outlines the multiple complex connections between the concept of energy justice and the emergence of different forms of energy citizenship. Specifically, through an Energy Justice Framework, it aims to highlight the importance of integrating elements of distributive, procedural and recognition justice to ensure an equitable and fair energy transition. Furthermore, the deliverable investigates the role of justice in the emergent Energy Union strategy and helps to devise paths for just energy citizenships, just policies leading to more durable governance arrangements and social just dynamics between energy citizenships and policies.
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Abbreviations and acronyms

EC	Energy Citizenship
GRETA	Green Energy Transition Actions
EJ	Energy Justice
EJF	Energy Justice Framework
EP	Energy Poverty
EV	Electric Vehicles
PV	Photovoltaic
RED II	Renewable Energy Directive II. DIRECTIVE (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources
STS	Science and Technologies Studies
IEMD	Internal Electricity Market Directive, DIRECTIVE (EU) 2019/944 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU

1 Introduction

1.1 Glossary with key definitions

This section will list key terms and definitions tailored to GRETA and the WP1 purposes. The definitions below are an attempt to frame GRETA's key terms. These definitions must be considered as suggestions rather than rigid explanations.

Energy citizenship: Energy citizenship is an emerging, yet promising concept in the energy transition theoretical framework as well as in its practical manifestation. Energy research is becoming more interested in understanding how people can become active participants in the energy system, thus being recognized as energy citizens. The concept of energy citizenship has been generally explained as the real engagement of citizens in behaviours and activities that support decarbonization, such as renewables' adoption and energy efficiency. It represents the human dimension of the energy system, whose decarbonization goals necessarily demand the inclusion of citizens into energy-related decision-making processes. Nonetheless, engagement and participation in the energy system can also take negative or problematic forms, for instance as public resistance to new forms of renewable energy.

Energy justice: Energy production, provision, access, and consumption raise important issues of justice. The Energy Justice Framework allows us to consider where unjust energy systems take place (distributional justice), who is affected (justice as recognition) and how to deliver fairer decision-making process (procedural justice).

Energy poverty: Energy poverty is defined as the inability of people to experience adequate levels of essential energy services such as heating, cooling, and lighting or people's lack of means to power their appliances. According to the EU Energy Poverty Observatory, energy poverty can also occur when consumers are not able to cover other expenses in addition to energy ones or when they are forced to reduce the energy consumption of their households with relevant consequences on their physical and mental health and well-being. High levels of energy poverty hinder the capacity of citizens to fulfil their potential in the energy transition; at the same time, structural barriers of energy poverty contribute to the problem, thus increasing the socio-environmental challenges of the ecological transition.

Energy Union: The Energy Union is a European strategy aiming to create an integrated European energy market to support the transition to a low-carbon, secure and competitive economy. The main objective of the Energy Union is to provide consumers – households and businesses – with secure, sustainable, competitive and affordable energy. Its main pillars are: security of supply, solidarity and trust; a fully integrated energy market; energy efficiency; decarbonization of the economy; research, innovation and competitiveness.

1.2 Description and purpose of the deliverable

This deliverable D1.2 investigates the role that energy justice has in the emergence of energy citizenship. The purpose is to provide the European Commission with a vision document on energy citizenship that analyses different scenarios, persons, both winners and losers, to help establish an energy citizenship-based Energy Union.

Energy justice is a well-established research topic within energy studies, and it has been addressed in the last decade from several academic disciplines and perspectives (see Jenkins et al., 2016). However, despite the growing interest towards the justice dimension of the energy system, there is still a need to explore the role that it plays, both as an analytical framework and a process, in the emergence of energy citizenship. It is relevant to understand how the concept of energy justice engages with practice and therefore becomes important for policy development and can provide society with an ethical framework for decision-making in the energy sector (Heffron and McCauley, 2017). Moreover, as a broad literature has deepened (Anand et al., 2018; Kluge and Negt, 2014; Larkin, 2013), energy infrastructures have complex social and cultural implications, far beyond their strictly technical and economic aspects. Specifically, this contribution seeks to conduct an analysis of the multiple connections between energy justice and energy citizenship concepts and practices. For too long, research and policy have narrowly addressed energy as a technical and economic concern. Recently, however, the emergence of several multi-faceted issues such as climate change have opened the way for applying justice principles to energy-related issues (policy, activism, production and consumption, security...) (McCauley et al., 2013; Jenkins et al., 2014; Fuller and McCauley, 2015; Sovacool et al., 2013). Decarbonizing energy systems raises important new concerns regarding social, economic, political, and environmental aspects and, as stated by Jenkins et al. (2016), “energy is a new centre of gravity for justice scholars” (p.2) who seek to contribute to conversations on a just transition that is, a transition to “thriving economies that provide dignified, productive and ecologically sustainable livelihoods; democratic governance and ecological resilience” (Climate Justice Alliance.org). To achieve a just transition, climate, energy, and social justice need to be merged to provide a “more comprehensive framework for analyzing and promoting fairness and equity throughout the transition from fossil fuels” (McCauley and Heffron, 2017, p.1). At the core of a just transition lies the foundation that promoting community energy will increase multidimensional justice, but it is important to underline that not all societal groups are equally positioned to benefit from community-oriented policies. Thus, energy justice research needs to focus on social conditions and processes as well as economic and political structures and institutions (Lee and Byrne, 2019).

The Energy Justice Framework will help to devise further effective ways of involving citizens in the energy transition leading to greater social acceptability as well as more durable governance arrangements and socio-economic benefits. The Energy Justice Framework is a three-tenet structure based on the three dimensions of justice theory: distributional, which concerns the socially just allocation of resources, recognition,

which relates to the consideration given to the knowledge, values, and norms of those most affected, and procedural, which concerns the idea of fair processes (Celentano and Caranti, 2020; Jenkins et al., 2016; Sovacool et al., 2017; Lee and Byrne, 2019). In our second understanding of energy justice, this might be visualized both as an “ongoing process and a social movement driving the process forward” (Szulecki and Overland, 2020). Based on Szulecki and Overland (2020, p.4) conceptualization of energy democracy, we think of energy justice as an “emerging social movement advancing renewable energy transition” in a fair, equitable and just manner and that is, in part, already here. Similar to some energy democracy conceptualizations, energy justice too includes efforts to *resist, reclaim and restructure* energy systems and, above all, does not constitute a fixed or pre-determined category but is continually made, constructed and remade through the performance of socio-material practices” (Szulecki and Overland, 2020, p.4; Chilvers and Pallett, 2018). Energy justice is a process. This conceptualization helps to visualize energy justice in its relational and performative dimension, as a continually evolving movement rooted in peoples’ claims for environmental justice and not as a natural, pre-given or unitary category.

This deliverable is especially important for Task 1.3 (Analytical framework for energy citizenship case studies and multi-national survey) and Task 1.4 (Energy citizenship framework alignment with GIS modelling and transition pathways approaches) of project GRETA. D1.2 is preparatory for both tasks, which will build on previous framework developed into the workings of the research team. D1.2 is also preparatory for other GRETA work packages (WPs), specifically for WP3 (data gathering) and WP4 (subsequent data analysis). Overall, D1.2 helps to achieve the main objective of WP1, which is to further elaborate on the concept and method proposed in a detailed and harmonized manner across all WPs. Indeed, WP1 provides the theoretical and analytical framework leading up to the advance of current understanding on energy citizenship contributing to the energy transition.

1.3 Methodology

This report has been led by UNIBO and written by several contributors from UNIBO, FhG, LUT and TNO. It is an in-depth literature review about energy citizenship and justice. The review has been conducted using a snowballing approach through a key word search on both Google Scholar and Scopus in order to find relevant literature on energy citizenship and energy justice. Specifically, each of the contributors has started with the review of a key paper on the subject they focused on (energy justice theory, drivers and barriers of energy justice, EU policies on energy citizenship and energy justice, energy poverty, energy and gender-based perspectives, energy and green energy technologies) and continued the review by taking into consideration the reference list of these key papers in order to identify relevant literature in the academic debate on energy justice and energy citizenship. For this report, literature in English has been the main source but the document also includes references to literature in German and Italian.

Secondary literature was also researched by FhG through Scopus with the search terms “energy policy” and “energy community” and “energy justice”. This allowed us to see who else already cited relevant articles and assess the scholarly community on those matters. Moreover, LUT has considered Jenkins et al. (2021) as the starting point to conduct its analysis and found other useful references that focused on various justice aspects of specific technology/technologies.

Further identified key words have been: “energy justice”, “energy justice theory”, “energy democracy activism”, “energy poverty” (TNO); “energy justice” and “solar PV/electric vehicle/smart meter/heating” (LUT); “energy justice theory”, “energy citizenship”, “energy union” (UNIBO).

2 Energy citizenship, energy justice and the emerging Energy Union

This section explores the definition and the purpose of the emerging Energy Union in order to understand why it is important to engage citizens and pursue an energy just transition.

2.1 Energy citizenship and justice

Realities and concepts of citizenship have changed radically throughout history and will keep changing (Hildebrandt and Peters, 2019). Here, following Isin's conceptualization (2017), we regard citizenship as performative, which is marked by political and social struggles over who may or may not act as a subject and features not only citizens but also non-citizens as relational actors, belonging to different social groups making rights claims. Indeed, according to Isin (2017), performative citizenship necessarily involves the exercising of a right: people enact citizenship by exercising, claiming and performing rights and duties; and "when people enact citizenship they creatively transform its meanings and functions" (Sanghera et al., 2018, p.542). Within the context of environmental and energy policies, processes of planning and decision-making are increasingly characterized by multiple attempts to involve the public in a participatory, inclusive, and bottom-up way. Since participation is not a neutral space in which citizens are represented, it is essential to question how participation may influence the ways in which citizens can become involved and/or further categorized (Turnhout et al., 2010). In this regard, participation should be broader reconceived as performative practice, in which both intended and unintended forms of citizen involvement are appreciated as meaningful and legitimate, and citizenship is interactively constituted.

The energy transition is the biggest challenge we need to confront in the following years. As assessed by the IPCC (2018), to limit global warming to 1,5°C emissions need to be brought to zero by mid-century. The achievement of this global goal requires important, structural economic, socio-cultural and political changes to which the EU aims to respond through four strategic objectives – decarbonising buildings, renewables uptake, energy storage, and sustainable mobility (The 2030 Climate target plan), well-aligned to the concept and practice of energy citizenship. Achieving the goal of decarbonization will require a combination of factors, trade-offs and synergies between policies, technological development and societal attitudes (Hainsch et al., 2021). Both the Energy Union and the EU Green Deal promote the participation of citizens and communities in the energy transition, putting them at the core of socio-technical innovations in the energy system and encouraging a bottom-up approach in the implementation of sustainable energy initiatives (Fernandez, 2021). Therefore, there is a need to enhance efforts to elaborate regulatory frameworks that can include

citizens and communities as full participants, thus guaranteeing the respect of energy justice principles and enabling a just transition for all. As underlined by Fernandez (2021), the Energy Union package has recognized that existing governance systems are inadequate to respond to the multiple challenges that lie ahead but it has also focused more on fostering the participation of individual citizens than of energy communities, showing “little progress” (p.93) in terms of implementation of concrete actions for community participation. Therefore, there is space for research and policies to unpack what the establishment of an Energy Union means in connection to energy citizenship and energy justice.

2.2 A just Energy Union

Green energy and energy security are both central in the EU decarbonizing energy policies. Working on the establishment of an Energy Union, the EU aims to ensure that European consumers – households and businesses – have secure, sustainable, competitive and affordable energy. This will necessarily require a fundamental transformation of Europe's energy system which is exposed in the Energy Union strategy (COM/2015/080) published in 2015 by the Juncker Commission (2014-2019). This is a strategic document that is meant to pave the way for the creation of an integrated European energy market, where cooperation is a crucial element to strengthen energy security, decarbonize the economy and reduce waste in energy consumption (Siddi, 2016). The formation of an Energy Union is probably the most ambitious and significant policy effort towards decarbonization in the European energy system (Vavrek and Chovancová, 2020). Within the Energy Union package there are some long-standing objectives of the EU energy policy as well as new elements, such as the focus on innovation and technological development of energy systems (Siddi, 2016). However, there are still practical gaps that need to be addressed to understand how to manage and implement the Energy Union package through a sustainable and environmental-friendly process as well as to address the risk posed by an excessive securitization of the Energy Union project (Siddi, 2016; Judge and Maltby, 2017).

The emerging Energy Union is the European ambitious attempt to create an integrated European energy market, which will support the transition to a low-carbon, secure and competitive economy. The main objective of the Energy Union is to provide consumers – households and businesses – with secure, sustainable, competitive, and affordable energy. The Energy Union strategy includes five mutually reinforcing and closely interrelated dimensions designed to bring greater energy security, sustainability, and competitiveness. These are: building energy security, solidarity, and trust; a fully integrated European energy market; achieving energy efficiency contributing to moderation of demand; decarbonizing the economy; enhancing research, innovation, and competitiveness. The European Energy Union responds to climate change by supporting mitigation efforts, creates jobs and growth, contributes to addressing energy poverty (measures include promoting investments in energy efficiency, which

helps to reduce energy bills). Essential to the making of the Energy Union is the active participation of citizens in the energy market. Thus, they become fully engaged in the energy system as both producers and consumers (prosumers). The Energy Union relies on the active participation of consumers, for instance to generate electricity for their own consumption, store it, share it, consume it or sell it back to the market. These are the main actions that define the emerging concept and reality of energy communities, introduced by the EU through the Clean energy for all Europeans package in 2016. Clearly, since the governance transformation that energy transition entails has complex and potentially unjust distributional, procedural and recognition consequences, it is fundamental to look at the Energy Union project through an energy justice perspective, especially considering the central role that citizens will have in the development of this project. We will discuss the Energy Union project in relation to energy justice and energy citizenship in Section 5.

3 Energy justice theory and forms of energy citizenship

This section aims to explain the origin and implication of energy justice in terms of an analytical framework and a process. Subsequently, in Section 3.2, it is explained how citizens currently evaluate and manage energy justice.

The energy transition confronts us with several challenges, one of which is to ensure that the transition to a low-carbon society will be achieved through a just and fair process. According to Energy Justice research, all individuals, across different areas, should be provided with “safe, affordable and sustainable energy” (McCauley, Heffron, Stephan, & Jenkins, 2013). The concept of energy justice can be understood in terms of both an analytical framework and a process. As a framework, energy justice allows to consider where unjust energy systems take place, who is affected and how to deliver fairer decision-making process.

Specifically, distributional justice considers the allocation of benefits and burdens of energy systems. It looks at the energy lifecycle stages, from siting of power plants to (early) development decisions (McLaren et al., 2013). It also addresses issues of energy affordability, notably energy poverty, considering the need to provide all citizens access to fundamental energy services. Recognition justice asks for the acknowledgement of those who are marginalized due to a complex assemblage of social, cultural, racial and gender differences (Simcock et al., 2021; Bouzarovski, 2018). This implies considering who is disadvantaged by old and new energy systems. Procedural justice conceives how to conduct fair processes and reach equitable outcomes in decision-making on energy systems (Fuller and Bulkeley, 2013). It requires the engagement of all people involved without any form of discrimination. The adoption of an energy justice perspective sheds light on blind spots and helps to raise awareness for potential injustices in the energy transition.

As a process, energy justice is strictly related to the emergence of energy citizenship. Citizenship, in a broader perspective that goes beyond its nature of formal status, is a performative result of acts and practices of citizenship. This means to look at energy citizenship as the result of actions performed on daily basis. It is also crucial to consider which are the informational bases of judgment (Sen, 1991; Borghi, 2018; Salais, 2009) that results from the conversation between different forms of knowledge and experiences feeding the decision-making process about energy issues.

3.1 The origin of energy justice

The concept of energy justice originates in environmental justice literature and the environmental justice movements preceding it (Dawson, 2010; Jenkins, 2018; Schlosberg 2009, 2013). The circumstances that lead actors to form a group to mobilize in defence of the environment do not always have environmental or ecological

motivations and ideologies at their origin. The case of the "Environmental Justice Movement", born at the beginning of the 1980s in the United States, is exemplary in this regard since it took shape as the offshoot of movements born to fight for civil rights. The movement was born in Warren County (North Carolina) during the fall of 1982, as a result of the participation of the inhabitants (mainly African American and Latinos) in the mobilization to stop the construction of a landfill of toxic waste, containing especially large amounts of polychlorinated biphenyl (PCB), organic compounds considered highly carcinogenic (Keucheyan, 2016). Afterwards, research findings have showed that polluting facilities have been often located next to poor Black and Latinos communities, rather than next to rich and white communities (Checker, 2005; Davies, 2006; Smith, 2006). According to Bullard (2000) these episodes represent an example of environmental racism, an arrangement that through systems of domination and exploitation brings together public policy and industrial activity to shift the cost of industrial pollution from those who produce it to minority groups. In addition, these experiences contributed to change the understanding of the very notion of "environment": at first, the definition of environment was limited to notions of spatial organization and to the idea of wilderness; only later these mobilizations recognized that the environment was that set of places where people live, work, and play every day of their lives (Schlosberg, 2007).

Both environmental and energy justice share some fundamental ideas, such as the development of fair policies (i.e., non-discrimination) and the equal distribution of ills and benefits. Yet, the focus of these concepts is slightly different; environmental justice focuses on environmental policies and its consequences in general, while energy justice is directed at energy policy and energy systems specifically.

The concept of energy justice is built on three pillars, namely: distributional, procedural and recognition justice (McCauley et al., 2013). Distributional justice concerns the equal distribution of energy benefits and ills. This means that all individuals, regardless of gender, income, race etc., should have equal opportunities to receive, for example, financial energy profits (i.e., benefits). Also, some groups may be more exposed to risks associated with (renewable) energy generation (i.e., ills). The above-mentioned research findings show that waste facilities are more often located next to groups often marginalized because of intersecting axes of class, race, gender and sexual orientation.

Procedural justice implies that everyone should be given equal opportunities to engage in decision-making procedures and that people's input for decision-making procedures need to be taken seriously (McCauley et al., 2013). In addition, procedural justice means that stakeholders in the energy landscape, such as governments and industries need to work transparently and impartially. A common example in which procedural *in*justice arises, is during participation procedures of wind turbine farms (Baker, 2016; Walker and Baxter, 2017). It is important to involve residents during these procedures, not only to adhere to the notion of procedural justice, but also because an inclusive and fair participation procedure increases residents' perception of wind turbines benefits (Mills et al., 2019). However, participation procedures are often not appropriately

transparent and inclusive, causing resistance under local residents and leading them to perceive the impact of wind turbines to be negative rather than positive (Mills et al., 2019).

Recognition justice states that individuals should have equal political rights, should be fairly represented and should be free from physical threats (McCauley et al., 2013). Recognition is not the same as participation and recognition justice is more than tolerance (Honneth, 1996). Moreover, it can manifest as a lack of recognition and a misrecognition or distortion of people's views. It emphasizes the need to recognize and understand different types of vulnerability, with energy poverty being just one dimension of socio-economic and environmental vulnerabilities. A failure of recognition justice manifests in different ways. First, policy makers might not recognize certain problems as such. This is for example the case in the Netherlands, where energy poor households (i.e., households with insufficient access to energy resources; Sareen et al., 2020) are not recognized enough, which causes a lack of national policies to support these households (Feenstra et al., 2021). Second, recognition *in*justice may also manifest in *mis*recognition, this encompasses a distortion of views that causes certain groups to be disadvantaged (Schlosberg, 2003). This was for example the case in Scotland, where the national policy regarding energy poor households was at first based on the notion that their living conditions were the consequence of a knowledge deficit (i.e., disabling them to make correct financial decisions; Walker and Day, 2012). This misrecognition interfered with efforts to deepen knowledge on this specific target group and caused a mismatch between their needs and the policy support offered.

3.1.1 Expanding the "three-tenet" framework of energy justice

The above mentioned and so-called "three-tenet" framework is currently the most used conceptual and analytical basis of energy justice, especially for what concerns energy-related issues. Its application in the energy research agenda has fostered analyses of unfair energy policies and projects. However, as valuable as this framework is, recent studies have underlined the need to go beyond it in order to grasp the multiple complexities of energy justice and enable a deeper understanding of the energy system. Lee and Byrne (2019), for instance, call out for an expansion of the research agenda of energy justice studies by focusing on injustices associated with energy production. Their research shows that, in order to effectively respect justice principles within the energy system, it is essential to look at the structural and ideological pillars of the problem that concur to (re)produce environmental injustice habitually. Specifically, Lee and Byrne (2019) do so by calling attention to two interlinked pillars that create systemic energy injustice: "(a) key design characteristics of dominant energy systems, which are direct sources of energy inequity (a structural pillar) and (b) political, economic, and technical ideologies which provide justifications for energy inequity (an ideological pillar)" (p.3). In order to expand the energy justice research agenda it is important to consider energy as a *social project* (Byrne and Toly, 2006), that is to critically "interrogate, rather than concede, the discourse's current moorings in technological politics and capitalist political economy" (p.23) by investigating "an

energy-society order in which energy systems evolve in response to social values and goals, and not simply according to the dictates of techniques, prices, or capital” (p.23). Reframing energy as a social project leads to challenge institutionalized logics of energy injustice and its path dependency, to contest dominant energy paradigm as well as to foster critical transformative thinking in *energy cultures* (Sheller, 2014).

3.2 Energy justice & citizens

In comparison with environmental justice, energy justice has received little attention from citizens and activist groups (Finely-Brook and Holloman, 2016; Fuller and McCauley, 2016). This may be explained by the fact that energy justice is primarily used as a policy framework, since it describes the grounds for energy policy decisions. However, various developments might contribute to increased citizen involvement in the future.

First, the energy transition is only just beginning. As the energy transition progresses, the concept of energy justice will become more important, as we will encounter more situations in which justice principles become relevant (e.g., increasing gas prices have more detrimental effects on people living in financial stress or energy inefficient dwellings). Second, the scientific interest in energy justice is growing and its documentation is improving. This might contribute to increasing interference of citizens with the concept of energy justice (Brook and Holloman, 2016).

Although the literature on energy justice is still expanding, some research has already been conducted on citizens' evaluation of energy justice with regards to energy policy decisions and procedures. This allows us to draw several preliminary conclusions on when citizens consider energy policy to be fair and based on what conditions citizens support energy policy measures.

First of all, according to several studies (Liebe and Dobers, 2020; Tyler, 2000; Liu et al., 2020) citizens find it important to have a say in energy policy (decisions) and energy projects (e.g., planning process of wind turbines). Moreover, Tyler (2000) argues that “participation effects have been found to be enhanced when people feel that the things they say are shaping the outcomes of the dispute” (p.121). At the same time, it seems that voice effects are not directly dependent on having control over the outcomes of the conflict since people value the opportunity to speak and express their views in decision-making processes irrespective of whether their words influence the final decision (Taylor, 2000). Interestingly, both in real and partial participation there is no substantial difference regarding procedural fairness of participation (i.e., general evaluation of a policy as fair or unfair among various societal groups). As Liebe and Dobers (2020) observe, in both cases perceived fairness is equally high. Only when people have no opportunity to speak at all or have no say, perceived fairness is significantly lower. The notion that people find it important to have at least some kind of say in energy policy and energy projects is reflected in studies on public acceptance

of energy policy. Lind and Arndt (2016) for example showed that public acceptance of energy policies is low when public participation is insufficient. Furthermore, if public participation is considered to be sufficient and fair this has positive effects on citizens' evaluation. Even if individuals do not agree with the outcome of a process, a fair participation procedure contributes to feelings of inclusiveness (Lind and Arndt, 2016).

In addition, there have been some studies conducted on people's evaluation of the three components of energy justice (i.e., distributional, procedural and recognition justice). The results of these studies suggest that some components of justice are considered more important than others (Bergquist et al., 2021). Bergquist and colleagues (2021) performed a meta-analysis on determinants for the acceptance of climate change mitigation policy. In their research they referred to 'fairness' instead of justice and they found that distributional fairness (i.e., distribution of benefits and ills) and overall fairness (i.e., "how (un)fair is policy X?") are more strongly related to policy acceptance than procedural fairness (i.e., opportunities to engage in decision-making procedures) and personal fairness (i.e., "how (un)fair is a policy for me?").

The finding that people value some aspects of justice more than other aspects is supported by the research of Dreijerink and Klösters (2020). Their research determined public support for climate measures and the reasons why individuals do not support certain climate measures. It was found that an unequal distribution of advantages and disadvantages is the most frequently mentioned reason not to support a policy measure (i.e., distributional justice). In second place, but far less mentioned, was the absence of a good alternative. This refers to recognition justice, as having no alternative might harm or exclude certain populations (e.g., renovating a home in order to connect it on a district heating network involves quite some financial costs, costs that not every homeowner might be able to pay in case of insufficient governmental subsidy). Finally, procedural justice was only mentioned a couple of times. Based on these results, it was concluded that citizens value distributive justice the most.

Altogether, these research findings suggest that people evaluate the importance of the different components of energy justice to a varying extent. It remains difficult though to draw solid conclusions as this research field is still in its infancy. However, there is no doubt that the literature on this topic will grow, as the energy transition continues and therefore our encounters with energy justice will increase as well.

4 Drivers and barriers of energy justice

This section explores the multiple connections between energy justice and energy citizenship by highlighting some of the drivers and barriers that respectively enable or prevent the emergence of just forms of energy citizenship. The four subsections discuss energy (in)justice according to the four main levels of involvement in energy citizenship described by GRETA.

4.1 Relation between energy (in)justice and involvement levels of energy citizenship

Every energy transition has its winners and its losers, both economically and in terms of social and community cohesion (Lennon et al., 2019). Energy justice is related to energy citizenship emergence in several ways. In this section, we connect both concepts by discussing examples of energy (in)justices for each level of energy citizenship involvement separately (see Figure 1 below). We argue that energy injustices may interfere with energy citizenship emergence, while energy justice may enhance energy citizenship emergence. Of course, even if the project is not directly focused on it, we fully recognize the crucial role of the institutional dimension, which intervenes in all levels of involvement and engagement we are going to deepen. The institutional dimension is in fact one of the key factors of conversion for enabling citizens' voice and action (Bifulco, 2013).

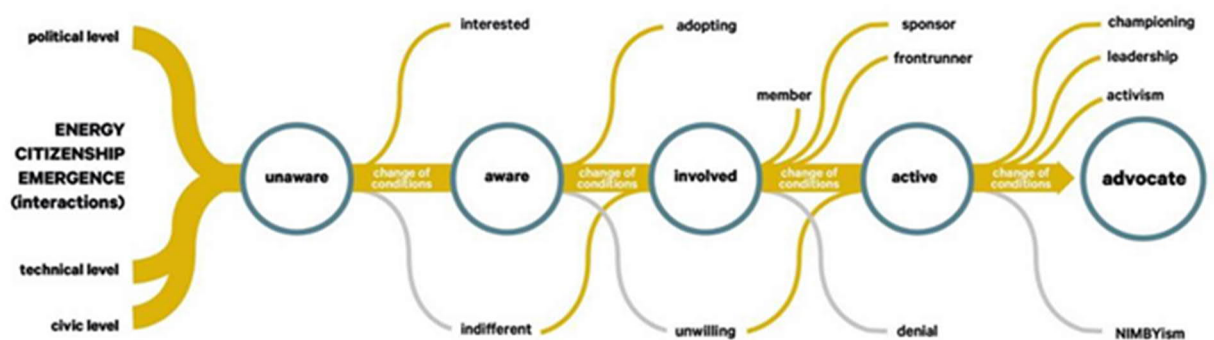


Figure 1. Overview of different levels of involvement of energy citizenship (original figure by Martina Massari, 2020).

4.1.1 From unaware to aware

Awareness plays an important role in GRETA's concept of energy citizenship emergence. Already at the first two levels of energy citizenship awareness, injustices may occur and hinder unaware citizens to become aware (thus more involved) energy citizens.

An example for this can be found in the literature of energy poor households (energy-poor because of low-income but also because of structural conditions such as older and less reliable infrastructures; household maintenance defects; and/or other systems fail; see Jessel et al., 2019). Research shows that vulnerable individuals and communities often experience significantly more energy insecurity entangled with other difficult issues such as financial stress, mental disorders (e.g., depression, anxiety) and physical health problems (e.g., respiratory diseases, rheumatism, influenza) than non-energy poor individuals (Balfour and Allen, 2014; Jessel et al., 2019; Liddell and Morris, 2010). However, this does not automatically lead to the assumption that energy-poor people do not think about the environment. Indeed, it is important here to make an important distinction between thinking about environmental matters and acting upon them. For instance, while energy-poor people might be aware and think about environmental issues (such as health-related consequences), they might lack the resources in terms of time, finances or education to actively engage in environmental change actions.

Duroy (2005) showed that economic affluence has a marginal direct influence on environmental awareness and no direct impact on environmental behaviour while urbanization, the level of subjective well-being and income equality, education are significantly correlated with awareness and environmental behaviour. While there might not be a lack of interest in engaging in sustainable energy actions, it is extremely important to unburden energy-poor people in becoming fully aware, for example by giving information and offering technical or financial support for installing energy saving measures. Simultaneously, following the literature on environmental racism and environmental justice (see Bullard, 1994; 2000) it is important to highlight that (energy) poor household and marginalized communities are often also disproportionally affected by adverse environmental impacts, such as air and water pollution (e.g., living next to highways, industry, landfills...) or climate-induced disasters. This usually leads those communities to be fully aware of environmental issues as well as detrimental and unjust environmental impacts. At the same time, this awareness does not directly correspond to involvement or action because of a structural lack of resources, both material and non-material ones.

Moreover, while energy poverty must be tackled in order to achieve a just energy transition, it is also fundamental to highlight that environmental and energy awareness must be discussed not only regarding energy poor households. Not suffering from energy poverty issues, indeed, does not automatically mean to be aware of energy services and sustainability and does not correspond to sustainable actions (Fairbrother, 2012; Martinez Alier, 2002). Moreover, as showed by political ecology and critical development literature (Kenner, 2021; Olivadese et al., 2020) while the role of the

richest in climate change (e.g., through their carbon footprint and investments) is unquestionably predominant, the same cannot be argued about their awareness on environmental issues, regarding both the causes of the environmental crisis and the potential solutions. Philippsen et al. (2017) found out that individuals with higher level of education and income were positively associated with environmental awareness. But, according to a study conducted by the [German Environment Agency \(2016\)](#), people with higher incomes usually consume more energy and resources, regardless of whether they perceive themselves to be environmentally aware or not.

Therefore, drivers for increasing citizens awareness should comprehend both socio-economic and environmental dimensions. The introduction of an *ecosocial policy* perspective moves in that direction: this notion can merge the ecological, social and economic dimensions covering the interconnections that characterize the ideas of sustainable development principles (Matthies and Närhi, 2017). Since it is not simple to provide an exclusive definition of ecosocial policy, according to some authors these policies can be better conceived in terms of a policy agenda, rather than as a predetermined concept. In times of global warming this agenda is supposed to include policies like those that support: the retro-fitting of housing; the building of CO₂-neutral social housing; support for small-scale energy cooperatives; social employment in the circular economy; quality public transport infrastructure in less affluent neighbourhoods; taxes on high-carbon luxuries, smart metering and energy saving advice for low-income households (Gugushvili and Otto, 2020).

4.1.2 From aware to involved

Multiple actors are differently involved in the energy system and several types of energy citizenship can be distinguished. Aware energy citizens might be motivated to take their engagement in the energy system one step further by adopting energy saving measures, such as energy efficient appliances, an electric vehicle, or solar panels (i.e., becoming an involved energy citizen). According to Yang and Zhao (2015), household income plays a positive role in mediating the relationship between the purchase attitude towards energy-efficient energy equipment and the behavioural intention. However, it is relevant to acknowledge that not everyone is equally able to buy energy-efficient appliances and measures. For example, subsidies to support the purchase of these kind of measures are often income based, disqualifying low-income households for these subsidies (Carley and Konisky, 2020). Low-income households are thus excluded from these subsidies, making it difficult for them to buy or install certain energy saving measures (i.e., distributional injustice). By recognizing this issue and supporting these households with the right compensation (i.e., recognition justice), energy poor citizens can be better supported to become involved energy citizens.

Another example in which tensions between energy justice and energy citizenship arise, is during citizen participation procedures. The shift to renewable energy sources comes with various opportunities for citizen participation, for example when deciding on locations for wind and solar parks. But, as described in Section 3.1, procedural injustice is common in these procedures. Participation procedures often lack

inclusivity, thereby interfering with the possibility for citizens to become an involved energy citizen.

4.1.3 From involved to active

One way in which involved energy citizens may become active energy citizens, is when they decide to join an energy community. An energy community is a group of citizens that collectively take action on sustainable energy, for example by generating, storing, consuming or selling their own solar or wind energy. Intuitively, energy communities are often argued to bring energy justice¹. This idea is raised by several believes: (1) energy communities are assumed to be more transparent in their decision-making process (i.e., procedural justice; e.g., Capaccioli et al., 2017) and (2) distribute financial profits fairly (i.e., distributional justice; e.g., Cointe, 2019).

Intuitively, elements of procedural and distributive justice are essential for a successful energy community project. Moreover, if the distribution of risks, costs, and benefits is perceived as fair within a community, this is said to benefit the social acceptance of renewable energy (Goedkoop and Devine-Wright, 2016). The empowerment of energy community members plays a positive role in the perceived justice of the community. However, these principles (transparency in the decision-making process, a fair distribution of financial profits, and participation) are not always respected and it is important to adopt a critical lens in addressing them.

For example, according to Park (2012) and Van Bommel and Höffken (2021), not all societal groups are equally positioned to start a community energy initiative or to benefit from policies aimed at fostering energy communities. Importantly, not everyone is equally likely to join an energy community even when one is living in the spatial boundaries of a community. This is for example the case when one cannot purchase solar panels because of insufficient financial means or when one does not have a suitable roof (Adams and Bell, 2015; Cointe, 2019). Specifically, several studies show that tensions within a community arise when financial profits are not equally distributed among its members, especially when the community shares ownership of renewable energy technologies (Cointe, 2019; Van Bommel and Höffken, 2021). In addition, even within the same community, experiences of procedural justice during the decision-making process may vary (Simcock, 2016).

These examples illustrate the various justice challenges that energy communities face, which interfere with citizens ability to become an active energy citizen. By aiding energy communities with the right tools and support, more citizens may be likely to

¹ <https://cor.europa.eu/en/news/Pages/unlocking-the-potential-of-local-energy-communities.aspx>

become an active energy citizen. However, there are other examples of active energy citizenship that are not achieved through energy communities. For instance, Bardsley et al. (2019) have underlined that through groups interaction it is possible to foster the normalization of new energy behaviours related to initiatives for increasing energy savings and energy efficiency. In this regard the case explored by Kim (2017) has showed how citizens have been involved in energy issues after Fukushima disaster. In this case the citizens have participated in energy savings initiatives starting with sharing their consumption data; moreover, they have organized workshop to explore several energy issues (Kim 2017). Therefore, people can become active also by increasing their knowledge and sharing them with other citizens or local municipalities representatives, as in the case of citizen science experiences with pollution monitoring (Wuebben et al. 2020). Finally, Olivadese et al. (2021) referring to some examples of Positive Energy Districts projects, have illustrated that energy citizenship can be realized also by being involved in decision-making concerning the planning of energy services in residential area.

To conclude, this section has explored how citizens can become more involved in energy issues and achieve energy citizenship by actively participating in new and experimental ways of producing and distributing energy, but also by increasing and sharing their energy related knowledge.

4.1.4 From active to advocate

In the final stage of energy citizenship emergence, an active energy citizen can become an advocate energy citizen. This occurs when a citizen encourages other citizens to become more involved as energy citizens. For example, when a member of an energy community encourages other citizens to become members of the community or start their own energy community. A citizen also becomes an advocate when he or she joins an activist group for renewable energy or energy justice. In this case, the framing of energy justice is likely to have multiple configurations based on different activist and advocacy groups' perspectives and actions (Fuller and McCauley, 2016). Importantly, becoming an advocate requires a certain degree of time and expertise (e.g., time to join an activist group, expertise on energy communities). It is inevitable that not all citizens possess these requirements. Another aspect to consider when addressing advocacy and energy justice, is that according to Si and Stephens (2021) people with stronger political power are generally more active in public participation including voting and policy advocacy. It is also equally important to take into account that experiences of energy injustices might cause citizens to negatively advocate sustainable energy. For example, this occurs when initiators want to build a wind farm near a residential area and residents do not agree with this or feel their concerns are not heard. This might lead to residents' protests against the building of a wind farm (i.e., NIMBYism; Hoen et al., 2019). Possibly, opening conversations with residents and listening to their concerns and worries might help to reduce these negative advocate engagements, as this benefits citizens' feelings of fairness and inclusiveness (Lind and Arndt, 2016).

Table 1 below summarizes the identified drivers and barriers that can foster the different level of citizens’ engagement in relation to energy justice.

Table 1. Identified drivers and barriers for different engagement levels in relation to energy justice.

Determinants		
	Drivers	Barriers
From unaware to aware	Education; socio-economic interventions; eco-social policies; institutional promotion of energy sensibility	Socio-economic conditions; structural barriers; lack of interest; lack of both material and non-material resources; local and national institutional absence of energy focus
From aware to involved	Socio-economic conditions; financial and technical support; education and knowledge; policies that support real participation; providing appropriate legislations; adequate collective and inclusive spaces for participation; transparency in governance of energy systems; flexibility of power and governance structures	Low-income; procedural and recognition injustices; institutional, infrastructural, financial and regulatory aspects
From involved to active	Narratives and policies that facilitate bottom-up engagement; financial benefits; local-led initiatives and decision-making processes; knowledge, trust and belonging; pooling skills and resources (school...); empowerment of local rights and entitlements; (perception of) agency	Lack or partial information and knowledge; (perception of) disempowerment, misrecognition, misrepresentation; unappropriated governance structures
From active to advocate	Time and expertise; education; political empowerment; socio-cultural factors: changes in values and interests (both individually and collectively); coordinated (citizens/institutions) initiatives, also through (local) agreements; (perception of) agency	Lack or partial information and knowledge

5 Energy citizenship and energy justice: governmental policies and plans

This section explores how EU energy policies affect energy citizenship, particularly regarding local energy communities, and analyses these effects from an energy justice perspective. Specifically, the aim of this section is (a) to introduce the most relevant EU policies for energy citizenship, (b) to present the relevance of energy justice for energy communities and (c) to connect the two by outlining the impact of policies on energy citizenship highlighting both positive and negative examples.

5.1 EU policies with a focus on energy citizenship and energy justice

The goal of a "fair and just [climate and energy] transition" is repeatedly stated in the updated European Union's 2019 policy Clean Energy for All Europeans (European Commission March 2019). As part of the policy, the European Union recast its Renewable Energy Directive (EU) 2018/2001 (RED II), which placed active energy prosumers (called "renewables self-consumers") and renewable energy communities at the centre of a successful energy transition (European Union 2018). Member states had until June 2021 to transpose RED II into national law, which they have done to different extent and form. From mid-2021 on, consumers - either as individual households, collective tenant projects, or as part of energy communities - theoretically have the right to "consume, store or sell renewable energy generated on their premises" (Lowitzsch et al., 2020).

The focus on active energy consumers/producers, i.e. prosumers, "at the heart of the energy markets" (RED II) speaks to an increasing awareness in the European policy community that consumer empowerment is an essential pillar of the energy transition process (Lowitzsch et al., 2020). The success of citizen-owned energy had, to date, depended upon support from national governments, which varied significantly across European countries (Hoicka et al. 2021). Local energy community initiatives can thus be seen as an important policy instrument to promote energy citizenship through prosumer empowerment within the EU. The definition of what constitutes an energy community has been left open for interpretation to national legislature. Yet, the new 2018 Renewable Energy Directive outlines a few principles that need to be implemented if local energy initiatives want to be recognized as so called Renewable Energy Communities (RECs). Important to note is the emphasis on the inclusion of vulnerable populations and equal and non-discriminatory treatment of consumers in potential energy community governance designs. Art 22 para. 4 RED II specifies:

"4. Member States shall provide an enabling framework to promote and facilitate the development of renewable energy communities. That framework shall ensure, inter alia, that:

(a) unjustified regulatory and administrative barriers to renewable energy communities are removed;

...

(f) the participation in the renewable energy communities is accessible to all consumers, including those in low-income or vulnerable households;

(g) tools to facilitate access to finance and information are available;

(h) regulatory and capacity-building support is provided to public authorities in enabling and setting up renewable energy communities, and in helping authorities to participate directly;

(i) rules to secure the equal and non-discriminatory treatment of consumers that participate in the renewable energy community are in place.” (Hanke und Lowitzsch 2020) (RED II, 2018, art. 22 par. 4)

The impact of RED II on the increase and use of renewable energy sources by prosumers and energy communities in EU member states remains to be seen. Generally, however, there is a strong assumption among scholars and policy-makers that a shift toward more consumer-oriented policies, such as the promotion of prosumer activity in energy communities, will result in a more just energy transition (see for example, European Committee of the Regions 12.07.2018; Milčiuvienė et al. 2019). The following section will assess this claim by analysing the examples of energy prosumers and renewable energy communities from a policy-oriented perspective.

5.2 The relevance of energy justice for energy citizenship - the example of prosumers and energy communities

This section aims to revise the theme of energy justice based on the most relevant points identified from the exploration conducted in Section 3.1.

In a recent article, van Bommel and Höffken suggest that policies governing European energy community initiatives should consider energy justice issues on three dimensions: within, between, and beyond such communities (van Bommel and Höffken, 2021). Analyses of energy justice issues within energy communities have often focused on distributional justice issues, such as equity of financial profits (Adams and Bell, 2015; Hall et al., 2018), and procedural justice concerns, such as transparency and participation during the decision-making process (Goedkoop and Devine-Wright, 2016; Capaccioli et al., 2017).

Yet, both distribution and process are intrinsically interconnected with issues of recognition. For example, as already mentioned, Bullard (1994) has long pointed out that in the US both the placement of landfills and power plants often ends up within or

close to communities of colour, who are disproportionately affected by environmental pollution. Recognition justice issues emerge when it comes to who is thought of and seen in terms of both participating in the (planning and implementation) process and the distribution of benefits and costs of energy technologies and infrastructures. Energy communities are often positively associated with opportunities to develop new skills, create jobs, and boost community resilience (van Bommel and Höffken, 2021). Yet, not everyone has access, the capacity, and/or knowledge to join or participate in such communities and often these issues are structurally interrelated to categories of race, class, and gender. As Grossman and Creamer show, participation in energy initiatives is often limited to a group with a specific racial and socio-economic background: white, middle class, and well educated (Grossmann and Creamer, 2017). Conversely, low-income communities and communities of colour either experience disproportionately negative effects or are excluded from positive changes of low-carbon transition policies (Carley and Konisky, 2020).

Moreover, gender injustices also need to be addressed in policies governing interactions within energy community initiatives – both in terms of recognition and procedural justice (Milčiuvienė et al., 2019). These implications for energy justice will be more deeply addressed through the document in the section on “Gender dimensions of energy justice”.

5.3 The interconnection of policies, energy justice, and energy citizenship

Injustices can also occur between energy communities or between an energy community and other institutions and actors within a country's borders. From a policy-perspective, three aspects are particularly relevant within an energy justice framework. First, the governance of a community's relationship with external parties. The literature shows that the relationship with external parties, such as developers, investors, and local authorities, impacts the perceived level of energy procedural justice for the community members (van Bommel and Höffken, 2021). This is particularly often the case for energy communities working with third parties, who have larger investment risks, and, consequently, make decisions without the involvement of community energy initiatives members (Brummer 2018; Goedkoop and Devine-Wright, 2016). The European Union addresses this issue in RED II, by asking of EU member states to facilitate RECs competition on equal footing with large-scale energy players. Research also shows that combined with well-designed local policies, intermediaries, such as third parties, can provide knowledge and support, which contributes to positive perceptions of all three pillars of energy justice: distributional, procedural, and recognition (Lacey-Barnacle and Bird, 2018; van Veelen and Eadson, 2020). Second, uncertainties surrounding governmental support and policy stability affect issues of procedural and recognition justice in community energy initiatives. Shifts in national priorities concerning energy technology, for example, can disproportionately impact smaller players, who often do not have a seat on the agenda setting and negotiation

table (van Bommel and Höffken, 2021). This results in their voices not being heard, included, or them not being recognized as relevant stakeholders in the first place. Third, resource challenges - such as finances, time, and knowledge - are as relevant in the relationship between communities as they are within a single energy community. Not all groups are equally positioned to benefit from energy community policies, which can cause policy interventions to have exclusionary instead of the intended inclusionary effects (Park 2012; Eadson and Foden, 2014).

Finally, there are justice issues that go beyond specific energy communities but that policy interventions need to be aware of (Pellegrini-Masini et al. 2019). This particularly concerns the issue of intergenerational justice. Göpel and Arhelger have shown that the European Union mentioned the need of protecting the interests of future generations as early as 1973 (Göpel und Arhelger 2010). More recently, and referring to energy transition, the European Commission stated that the European Green Deal "...supports the transition of the EU to a fair and prosperous society (...) improving the quality of life of current and future generations" (European Commission 2019, pp. 23-24). While intergenerational concerns mostly affect policy interventions in terms recognition justice, they also come into play when it comes to just procedures and long-term distributional effects.

To promote fair and just energy communities, and prosumer activity in general, policies need to actively account for these potential multiscale energy (in)justices (Sovacool et al. 2019). This section concludes by providing a few selective examples of policy interventions within the EU that have successfully addressed some of these issues. For example, the Bristol Community Energy (BCE) Fund address recognition justice challenges by having an explicit goal to get their funding "to groups and communities that are normally excluded, not just from environmental stuff but from funding generally" (Lace-Barnacle and Bird 2018, p. 78). Hanke and Lowitzsch list Energent in Belgium (<http://energent.be>), Enercoop in France (<http://enercoop.fr>) and Energia Positiva in Italy (<https://www.energia-positiva.it>) as examples of renewable energy organisations and projects that work towards the inclusion of vulnerable groups therewith trying to address the three pillars of energy justice. At the same time, they also criticise the still existing lack of national "enabling frameworks" that the EU calls for in the Clean Energy for All Europeans Package (Hanke und Lowitzsch 2020). While a detailed analysis of the EU member states' National Energy and Climate Plans in this regard has yet to be done, France seems to have introduced an innovative inclusive approach for the transposition of RED II: The 2019 French law on Energy and Climate defines specific compliance criteria for RECs while also defining by law the legal entity implementing a social housing project as a potential REC. Moreover, the law also defines the residents of these buildings as REC members by default (Hoicka et al. 2021), hence identifying and including vulnerable populations in the policy instrument empowering energy citizenship.

5.4 The Energy Union project through an energy justice lens: implications for energy citizenship

The European Commission energy plan aims to put the EU in the position of leading the energy transition, not only adapting to it (European Commission, 2016). As previously mentioned, the Energy Union is an ambitious project that aims to provide all EU consumers with secure, sustainable, competitive and affordable energy through three main steps: an appropriate regulatory framework, strategic investments to innovate the EU's energy system, and an integrated multi-level energy governance framework (Horstink et al., 2020). A strategic point in the establishment of an Energy Union is to stimulate the involvement of energy consumers in the energy market: this means that citizens are expected to become active customers or, better, energy prosumers. Decentralizing the energy system by placing citizens at the centre of the Energy Union would facilitate a more rapid take-up of renewables in the EU energy system (Horstink et al., 2020). The vision of the Energy Union demands in-depth structural changes and promises significant socio-economic as well environmental benefits. As socio-technical systems, energy systems are deeply interrelated with economic activities, everyday lives and governance configurations. Thus, their radical transformation requires wide-ranging and varied political and economic changes with geographical, technological and social implications across the EU. Understanding how the Energy Union project might function in facilitating a just transition means to look – also – into its dimension of justice according to the distributional, procedural and recognition pillars of the Energy Justice Framework. In this regard, however, there is not much literature yet, underlining the need to fill this gap. Ringle and Knodt (2018) have addressed the Energy Union project in terms of its economic efficiency, governance effectiveness and acceptance by the different actors involved, while Horstink et al. (2020) have highlighted the current state of play for collective forms of RES prosumerism in Europe considering the demands and promises of the Energy Union. The latter specifically studies the factors that foster prosumerism by underlining financial, legal, gender, social and technical aspects of RES prosumer initiatives and how to address them to accelerate the process of an Energy Union. According to the results of their survey, the role of procedural and recognition principles is relevant to understand in order to develop a just Energy Union in which bottom-up solutions, social/non-financial values and fair, open and inclusive participation (especially for marginalised groups) are particularly valued.

6 Interaction between different forms of energy citizenship and their justice

This section aims to explore and analyse how emerging forms of energy citizenship interact with the concept of energy justice. Specifically, the goal is to observe how different levels and forms of energy citizenship are perceived and accepted as fair and just initiatives.

6.1 Investigating energy citizenship and energy justice through a triple lens approach

As a matter of fact, if energy citizenship can both accelerate and democratize the energy transition process, it also entails new challenges concerning the distributional, procedural and recognition levels of energy justice, both in theory and practice. According to Daggett (2019), energy is “perhaps the problem of the Anthropocene” (p.187) and discussions about energy have to acknowledge its entanglements with centuries of domination on life. The socio-ecological transition towards low-carbon energy cultures can support the emergence of new transformative experiences and help narrate new energy stories (Daggett, 2021) such as those centred on energy citizenship. However, to achieve these goals, there is need to address the several implications that the decentralization of the energy system entails in terms of fairness and justice, especially for those individuals, communities, and territories often neglected in energy politics.

Modern life is intrinsically and inextricably dependent on access to energy, thus the very concept of energy must be changed in order to rethink socio-ecological relations and enable a good life for all, which is the objective to achieve according to the Foundational Economy Collective (FEC, 2018). As the FEC conceptualizes energy as an essential element of the foundational economy, theorised as the infrastructure of everyday life, energy becomes a new target of today’s key challenge, that is to “collectively secure the well-being of current and future generations” (Calafati et al., 2021, p. 17) while avoiding further injustices and the transgression of planetary boundaries. Informed by Energy Justice theory (Jenkins et al., 2016) as well as by the foundational economy, both as empirical reality and way of thinking (Bärnthaler, Novy, and Plank, 2021), this section will explore how energy citizenship is perceived in terms of fairness and justice through a triple lens focuses on: energy poverty, gender inequalities, and green energy technologies. As mentioned before and as explored in the next sections, the development of different forms of energy citizenship will not automatically lead to a more just energy system compared to the current one, based on fossil fuels. Therefore, the disentanglement of the many implications of energy justice in the emergence of energy citizenship (through energy communities, through material

participation, through gender equality...) is particularly relevant for enhancing knowledge on what is a just energy transition and on how to achieve it.

6.2 Gender dimensions of energy justice

The engagement of citizens toward becoming energy citizens is deeply socio-political, a key aspect of which are embedded gender and social inequalities in the energy system. While a gendered perspective on the energy transition is not yet part of mainstream research, an increasing number of scholars has been addressing gender dimensions as part of the energy justice research agenda. As mentioned above, the transition toward a low-carbon energy system and the development of energy citizenship does not automatically translate into a system that is fairer and more just compared to a system based on fossil fuels (Johnson et al., 2020). But a gendered perspective can support the transition toward just citizen empowerment in crucial ways.

Gender is a form of socially constructed difference that translates into different inequalities and hierarchies traditionally between women and men (Johnson et al., 2020). However, a gendered perspective in relation to justice issues in the energy transition needs to address gender issues beyond simply counting men and women. More recently, for example, the literature has integrated a much wider notion of social equity, which captures the intersectional nature of gender (Kaijser and Kronsell, 2014). Gender is a culturally (re-)constructed category that produces policies that subsequently "mediate access to resources, exposure to pollutants, and opportunities to participate in energy resources management, policy, and science" (Allen et al., 2019, p. 3; Ryan, 2014). Thus, a gendered perspective needs to include categories such as race, class, age, geography, field of expertise, etc., making intersectionality visible and therewith go beyond a simplified binary understanding that conflates the concept of gender as male and female sex (Søraa et al., 2020; Cannon and Chu, 2021). Diversifying the energy transition is important to achieve a successful and just transition (Preuß et al., 2021). It is important to consider that gender is only one aspect of diversity, however, one of the most researched ones.

Feminist theories can help understand and make visible power dynamics in both the current and transition energy systems. Critical feminist approaches help to conceptualize power as relational, productive, and situated, which enables the study of the co-production of social relationships - such as gender, race, and class - and energy technology. In this regard a feminist approach to energy systems allows to understand why adding clean energy to the grid is not enough to pursue a just transition. This perspective suggests that the complexity of energy transition should not be reduced to the search for social or ecological purity: on the contrary, progress narratives based on technological empowerment are harmful, especially when they forget to consider care work and socially reproductive labor (Bell et al., 2020). Specifically, four dimensions of energy issues are considered from a feminist perspective: political, economic, socio-ecological, and technological. The first dimension looks at the political nature of energy

systems, considering who has the power to know and control the production of energy; the economic aspect stresses the fact that the analysis of energy systems should not overlook the patterns of energy consumptions and how these rely on the idea of relentless economic growth; the socio-ecological dimension suggests that the evaluation of energy systems has to incorporate the needs and interest of all living species; finally, the last dimension indicates that the design of technology should prioritize the benefits of the final users (Bell et al., 2020). Understanding how different categories, such as gender, influence and are influenced by the different dimensions of energy is central to the analysis of energy citizenship (Ahlborg, 2017; Meadowcroft, 2009).

6.2.1 Balancing gender representation and participation in energy systems

There have been important research contributions analysing different roles, access and distribution issues in regard to the energy sector.

For example, research on gender and energy transition has highlighted unequal access to and use of energy services and local energy initiatives, which has significant effects on vulnerable populations in regard to both distributional and procedural justice (Clancy and Roehr, 2003). At the household level, studies have shown that women are more often affected by structural inequality than men when it comes to access to and use of energy services. While this trend is global and affects all three dimensions of energy accessibility, i.e. availability, affordability, and reliability, it is noteworthy that a significant amount of data linking women and lack of energy services comes from developing countries (Clancy et al., 2002). However, also in Europe, women are often disproportionately impacted due to the triad of higher amounts of time spent at home, higher amounts of work in the household, and lower average incomes (Feenstra and Özerol, 2021, p. 1; Rätty and Carlsson-Kanyama, 2010). Research also indicates a significant gender difference at the energy community level. "The average 16% gender pay gap in the EU means that women have less income to invest as capital in RECs, and across Europe, women have invested less in and own smaller shares of RE cooperatives than men" (Hoicka et al., 2021). Correspondingly, actors who are most often credited for active participation in energy community initiatives identify and/or are read as male (Capaccioli et al., 2021). It is noteworthy that women are more likely to actively participate in other pro-environmental behaviours (and consequently, other the energy communities) than men (Swim et al., 2019).

Unequal access to and the use of energy are caused by several systemic factors. A lack of decision-making power - both in the energy industry and the political sector - results in an unbalanced gender-representation in both the decision-making processes (participatory injustice) and policy outcomes (Sorman et al., 2020). All over Europe the share of non-male board members is lower than the share of male board members. In energy communities in Europe, women are underrepresented as members (with 30% of female members) as well as on the boards (Hanke et al., 2021). This is less but still true in the renewable energy sector (Allison et al., 2019). To ensure all three dimensions of energy justice, it is important to create an energy system that is providing access to

decision-making for all genders (Cannon and Chu, 2021). When looking at the workforce, Pearl-Martinez and Stephens (2016) show that a gender imbalance is visible in countries all over the world and conclude: "If the energy industry does not prioritize gender diversity now, the renewable energy transition could perpetuate and deepen, rather than reduce, gender inequality" (Pearl-Martinez and Stephens, 2016, p. 1). Also further possible advantages are left behind. Research points out that companies with diverse teams "have more innovation and revenue growth than their competitors" (Allen et al., 2019, p. 4).

Relatedly, participation in energy transition is not just a question of economic capacities and a physical seat at the negotiation table. Stendal et al. (2020) analyse prosuming by applying a gendered lens and arguing that differences between men and women in installing and using household solar systems are gendered in the sense that women and men have different economic, social, and cultural capital (Stendal et al., 2020). However, there is limited research so far on the socio-political dimension of gender and how gender identities impact citizens' perceptions of new energy technologies, participation paths in local energy initiatives, and energy use and accessibility in households that diverge from traditional assumptions of the nucleus family unit. Further research is needed to explore gender from an intersectional perspective to analyse its interaction with the development of energy citizenship.

6.3 Energy poverty and energy justice

Despite the cruciality of tackling energy poverty for a just socio-ecological transition, there is still no common and shared definition on what energy poverty is on a European level. This shows how the social dimension of energy has often been overlooked in favour of security, economic and technical aspects. Here, we built on the very general and broad definition by Bouzarovski (2018) who explains energy poverty as occurring "when a household is unable to secure a level and quality of domestic energy services—space cooling and heating, cooking, appliances, information technology—sufficient for its social and material needs" (p.1). Energy poverty affects more than one billion people worldwide, even if the causes vary according to different geographical, socio-economic, political and environmental contexts. It is estimated that over 34 million people in the EU are experiencing energy poverty to various degrees, with the most vulnerable social groups disproportionately affected (EU Energy Poverty Observatory, 2017). As argued by Carrosio (2020), the energy transition policies implemented at different levels in the European Union have excluded and further marginalized both people and territories from decision-making and multiple benefits. Nonetheless, addressing energy poverty remains crucial to face climate change challenges through mitigation and adaptation measures. Therefore, focusing on the living conditions of the weaker classes and addressing both social and environmental policies may represent a starting point to pave the way towards the emergence of energy citizenship, pivotal for a just transition to a low-carbon energy system (Carrosio, 2020; Henry et al., 2020). Considering how energy poverty is embedded in

infrastructural and institutional dimensions of energy systems and how it affects both consumption structures and policies of energy flows helps to reframe the debate on energy poverty (or fuel poverty) by shedding light on the multidimensional and cross-sectorial nature of the phenomenon (Bouzarovski, 2018; Jessoula and Mandelli, 2019).

To include all people in energy transition, policymaking must aim at improving the quality of life of all, especially the vulnerable ones, like those who suffer from energy poverty, that is a condition that takes place when the inability to power and warm a house “does not allow for participating in the lifestyles, customs, and activities which define membership of society” (Buzar, 2007, p.9). Low-income households who experience energy poverty spend a relatively high proportion of their income on energy intensive needs such as heating and or cooling and would thus be harder hit if a general rise in energy prices occurs because of prices increase in a phase of energy transition (Büchs et al., 2011). However, because of the relevance of specific contexts to determine the condition of energy poor, the European Union has struggled to provide a unique definition of energy poverty and a set of scientific indicators to measure it, slowing down the implementation of policies (Jessoula and Mandelli, 2019). Eventually, in 2017 the European Commission has founded the EU Energy Poverty Observatory (EPOV) to share among Member States knowledge, innovative policies and best practices addressing energy poverty. However, in some circumstances this lack of uniformity can turn into institutional misrecognitions risking then to reproduce energy poverty systematically (Simcock et al., 2021). Since there is no shared definition of the energy poverty concept because of its multi-dimensionality, it is extremely difficult to measure the size of the problem. At the same time, considering that measurement criteria have the power to include and/or exclude social groups and categories, it is paramount to look at the several (in)justice implications that might emerge by applying certain criteria instead of others. To overcome such challenges, the EU Energy Poverty Observatory has elaborated a set of primary and secondary indicators to be used in combination in order to “give a snapshot of energy poverty issues, which can then be explored in more detail in research and action projects” (https://energy-poverty.ec.europa.eu/energy-poverty-observatory/indicators_en).

The phenomenon of energy poverty or fuel poverty is a multifaceted issue that is not possible to reduce to mono-causality and that changes across spatio-temporal, cultural dimensions and social expectations (Jessoula and Mandelli, 2019). Nonetheless, so far discourses on energy poverty have narrowly focused on the link between energy and economic development (e.g., focus on “developing countries” in which more than one billion people do not have access to electric power and must turn to less traditional and unhealthy energy sources), thus disregarding other relevant aspects of the debate and hindering the emergence of successful solutions. Looking at the EU, for instance, the key-question of energy poverty is not related to access, but to the cost of energy services: this important detail is, according to Jessoula and Mandelli (2019), part of the reason why the problem of energy poverty has not been adequately addressed in those countries where households can rely on relatively efficient energy systems. In these countries, energy-poor households tend to pollute (and consume) more because of structural building inefficiencies and tend to be the worst affected by climate change

increased energy consumption. Since policies on energy transition led to a considerable increase in energy prices (e.g., in the EU; Jessoula and Mandelli, 2019) and have mostly favoured the upper middle classes instead of the lower middle classes (e.g., through tax deductions and economic benefits; Carrosio, 2020), it is clear that inequalities have increased and that “new” issues of (in)justice have emerged. So far, energy transition policies have had the tendency to address the consequences rather than the root causes of social, environmental, and economic problems, leading to several injustices that came to be recognized and addressed only recently (Carrosio, 2020). The need to find new ways of conceiving more socio-environmentally just policies has never been so urgent.

6.4 Green energy technologies and energy justice

Energy systems represent sociotechnical systems, that is heterogeneous assemblages of people, artifacts, infrastructures, everyday activities, cultural categories, consumption patterns, values and laws, as well as natural resources (Hess and Sovacool, 2020). Such an approach is crucial to grasp justice implications of energy systems since it allows to consider the role of path dependence of very large infrastructural and socio-material systems, inequalities that are not taken into account during infrastructural planning and the fact that the relationship between users and artifacts is not linear but co-constituted in everyday practices (Hess and Sovacool, 2020). A recent systematic and comprehensive review by Jenkins et al. (2021) indicated that solar power, followed by wind power and heating/cooling technologies, was the most mentioned technology in academic energy justice literature published between 2008–2019. However, although energy justice studies often address renewable energy technologies, it is not because they would be particularly prone to energy injustices. Indeed, as Jenkins et al. (2021) note, fossil fuels and nuclear power entail severe externalities and social and economic costs. The review also noted that emerging technologies, such as hydrogen, have received little attention in the energy justice literature. Energy justice studies focusing on specific technologies or energy sources have emphasized the importance of considering the impacts across different spatial and temporal scales (Sovacool et al., 2019a; Macpherson-Rice et al., 2020). For example, Sovacool et al. (2019a) analyse energy injustices at micro (households and communities), meso (across a nation or subnational region), and macro scale (transnational, regional and global scale) and across the lifecycle stages of production/distribution, consumption and disposal/recycling.

This subsection discusses energy justice implications of selected technologies including solar photovoltaic (PV), electric vehicles (EVs), smart meter and home automation systems, and heating related technologies. We focus especially on the aspects of the technology user but briefly address also the implications beyond the individual user/community. Moreover, as argued by Ryghaug et al. (2018), the introduction of new energy technologies and advices may create new energy practices and foster energy citizenship. According to this perspective, new energy-related material objects

can support people to actively engage in sustainable energy transitions as important stakeholders that use technologies, influence innovation trajectories and engage politically in transforming the current unfair and unsustainable energy systems. The key-question of who can engage and why in the energy transition through material participation, for instance, is yet to be answered. This aspect raises critical doubts about the democratic character of the decarbonization process at all geographical, social and political levels.

6.4.1 Energy justice and solar PV

Measured by installed capacity, solar PV has been the fastest growing renewable electricity source in the world between 2013 and 2019 (IEA, 2020). In 2018, distributed solar PV (i.e., residential rooftop systems between 0 to 10 kW, commercial and industrial rooftop and ground-mounted systems between 10 to 100 kW, and off-grid PV systems between 8 to 100 kW) explained 40% of the global PV growth (IEA, 2019). Households that install solar PV may save money by generating their own electricity, earn from feed in tariffs, and benefit from increased reliability if they have own generation available during outages in the grid (Sovacool et al., 2019b). However, while people who can afford to acquire solar panels and have appropriate roof space to allow installation have been able to benefit from own generation and support mechanisms such as feed in tariffs and net metering, people with low-income, people living in apartments and those renting their homes have been largely excluded from such benefits (Eisen and Felton, 2019; Sovacool et al., 2019a,b). There has even been critique about the poor subsidizing the wealthy as feed in tariffs have been financed by all electricity users via a levy on their bills (Sovacool et al., 2019a,b; Eisen and Felton 2019). Furthermore, there has been concerns that PV owners do not pay fair share of electricity distribution and transmission costs (Strielkowski et al., 2017; Sovacool et al., 2019b).

Solar installations beyond the residential scope raise also aesthetic concerns. For example, Roddis et al. (2018) noted that the larger the proportion of modern infrastructure in the visible landscape, the higher the approval rate of wind and solar farm (over 1 MW projects) planning applications. Thus, the visual impacts may be concentrated within specific locations (Roddis et al., 2018). On the other hand, Eisen and Felton (2019) stated that renewable facilities need to be located where physical conditions are suitable which is typically not around major population centres, leading to an urban-rural divide. Conflicts over land use may emerge, as Roddis et al. (2018) also discovered that solar farm applications made on high-grade agricultural land were less likely to get permissions. Furthermore, Kienast et al. (2017) identified land-use conflicts related to several renewable energy types. While the identified conflicts related to rooftop solar PV were mainly limited to visual impacts on historic and traditional buildings, ground mounted solar PV raises a wider array of concerns including visual impacts in areas that were previously free of technical installations, and conflicts with touristic and recreational use and with symbolic content of places expected by locals. In addition, ground mounted solar PV may prevent arable production and reduce species diversity (Kienast et al., 2017). Socio-environmental

conflicts raised over solar and wind farms in some areas of Sardinia have even led local committees and newspapers to use the evocative term of *energy servitude* (Deliperi, 2021) to underline the risk for the region and the surrounding sea to become an energy hub without any benefits for the local population since more than 38% of the energy locally produced will be exported abroad. Similarly, looking at the project of the biggest wind offshore farm around the Egadi Islands (Sicily), D'Angelo (2021) highlights the multiple, often invisible contradictions of the energy transition, which is frequently implemented following business as usual predatory patterns without taking into account socio-economic, aesthetic, cultural and fundamental biodiversity aspects.

However, solar installations may also provide local advantages such as benefit packages to local communities, rent income to land-owners, and jobs and new firms in the communities (Roddis et al., 2018, Eisen and Felton, 2019). Yet also these benefits may be distributed unevenly since women and people of colour are underrepresented in the solar sector workforce (Eisen and Felton, 2019). Solar power installations raise concerns also over procedural justice. When it comes to small-scale/residential installations, people without access to the internet, with poor health, financial difficulties and lower education may have less information and knowledge about solar PV equipment (Sovacool et al., 2019b). Related to larger installations, Roddis et al. (2018) noted that affluent communities are better represented in solar and wind farm planning processes, leading to concentration of some renewable energy projects in the more deprived areas. On the other hand, Eisen and Felton (2019) refer to underrepresentation of prosumers (and even more so of the disadvantaged groups) in regulatory dialogue, fragmented energy governance (across scales and issues), and expedited permission process for renewables as challenges for the procedural justice. Although the shift away from fossil fuels is largely seen as a necessity, solar transition leads to disruption to conventional electricity suppliers across Europe and to areas and countries producing fossil fuels, and may lead to adverse societal impacts such as loss of jobs in some areas (e.g., closure of coal mines and power plants in Eastern Germany) (Sovacool et al., 2019a).

6.4.2 Energy justice and electric vehicles (EVs)

Electric vehicles have been widely discussed as a means to decarbonize the road transportation sector (see e.g. European Commission, 2020). In addition to reducing global carbon emissions, replacing fossil fuel powered vehicles with EVs may improve air quality in cities and in neighbourhoods where EV owners live/drive thus leading to health benefits (Sovacool et al., 2019b; Eisen and Welton, 2019; Henderson, 2020). However, Sovacool et al. (2019b) note that there is a risk of shifting pollution from urban areas (tailpipe emissions) to areas where power plants are located. Furthermore, as EVs are perceived more environmentally friendly than conventional vehicles, they may be used to justify expansion of the road network (also on ecologically sensitive areas) and increase driving (Sovacool et al., 2019a; Henderson, 2020). Moreover, decarbonization through EVs relies on decarbonization of electricity generation, and 100% renewable power systems are far from reality in many countries (see Henderson, 2020).

EV drivers benefit from lower fuel costs and from additional local incentives such as road toll exemption and free parking (Barton, 2017). However, EV adopters tend to be those with high income and education levels and who live in urban areas (Sovacool et al., 2019b). Similarly, as with solar PV, there have been concerns that people who cannot themselves afford an EV end up subsidizing the EV owners (Sovacool 2019a, b; Eisen and Felton, 2019). This aspect is especially relevant to Science and Technologies Studies (STS), which address and highlight the role of citizens and public support and engagement in transitions towards low-carbon energy systems. For example, according to Ryghaug et al. (2018) who draw their research upon the theory of material participation, the introduction and use of emergent energy technologies – material objects - can foster new and sustainable energy practices, thus transforming the dominant paradigm of energy cultures. Specifically, they argue that, as artefacts such as EVs, smart meters, and solar PV become part of everyday lives, they can enact people facilitate the emergence of concerns regarding climate change and sustainability and foster participation in the energy transition (identified as political matters of concern) as a *co-produced* phenomenon (see Chilvers and Longhurst, 2016) through new ideas and practices of developing different forms of energy citizenship. Thus, discussing the role of renewable technologies in the domestic sphere might be relevant to expand the energy transitions research agenda. In addition, the access to charging infrastructure may be problematic for people in rural areas and for city dwellers without off-street parking (Sovacool et al., 2019a, b). There is thus a risk that those unable to drive an EV end up using more time and money for car use due to increasing taxation of petrol or diesel cars and higher fuel costs, closure of fuel stations due to increasing EV uptake, and less alternatives for car ownership (Sovacool et al., 2019b). On the other hand, increased EV use may also bring conflicts over use of urban space due to required charging infrastructure and potential needs to expand the existing electrical grids (e.g., larger transformers and substations) to accommodate them, and because of EVs claiming the same urban spaces as green mobility (e.g., cycle lanes, bus lanes) (Henderson, 2020).

6.4.3 Energy justice and efficiency technologies

Enabling technologies such as smart meters and home automation systems facilitate more efficient energy use, whether it is about use of electricity when own generation is available or reacting to dynamic tariffs (and thus the overall situation in the energy system). However, also these technologies and tariffs raise potential justice concerns. Eisen and Welton (2019) note that grid modernization initiatives such as the smart meter roll out lead to large up-front spending and electricity tariff increases. Furthermore, adoption of time variable tariffs may lead to increased costs especially to consumers unable to shift their consumption, a group that may include low-income and elderly people who cannot afford supporting technologies such as home automation systems, automated appliances and smart homes (Eisen and Felton, 2019; Sovacool et al., 2019a). Furthermore, Sovacool et al. (2019a) state that smart meters may lead to tensions within families. On the other hand, both smart meters and automation services rely on reliable network connections, which may exclude customers especially in some rural areas (Sovacool et al., 2019a; Annala et al., 2021).

6.4.4 Energy (in)justice in production and consumption of green technologies

Injustices have also been identified in the production and disposal stages of solar panels, EVs and smart meters as 1) extraction of minerals and metals needed in the manufacturing may take place in countries with poor working conditions and environmental standards and 2) second-hand fossil fuel vehicles, damaged EVs, and disused solar panels and smart meters may also end up in such countries (Sovacool et al., 2019a). Furthermore, as a shortage of minerals used in batteries and electronics is predicted, global conflicts may rise (Henderson, 2020).

Space heating accounts for almost 64% of energy consumption in EU households (Eurostat, 2021). Heating choices thus have a significant impact on carbon emissions and energy expenditure of households. However, the energy justice implications of heating are not limited just to the actual heating systems and fuel choices. Heating is also strongly related to building structures and their thermal insulation, as well insulated buildings need less fuel to stay warm (Bouzarovski and Simcock, 2017; Sovacool et al., 2019b). According to Jenkins et al. (2021), the heating technology aspects considered in energy justice literature have been mostly limited to fuel poverty concerns. Inability to maintain adequate heat in a building may deteriorate the health of both the building (e.g., lead to mold) and its residents (Bouzarovski and Simcock, 2017). Furthermore, some heating choices made because of energy poverty (e.g., use of low-grade coal or fuelwood) may impact the whole neighbourhood by increasing air pollution (Bouzarovski and Simcock, 2017).

While heating related energy use, emissions and costs may be reduced by changing the energy source or upgrading the thermal insulation, such investments may not be feasible for people with low income or for people who rent their homes (Sovacool et al., 2019b). Furthermore, the heating choices depend also on the availability of alternatives such as district heating or upgraded electricity networks (Sovacool et al., 2019b). However, while a connection to the district heating system may be mandated to increase financial feasibility of such an investment, such an approach also increases perceived injustice (Muncada et al., 2018). On the other hand, local ownership of district heating system may provide additional benefits such as lower and more stable energy prices (Muncada et al., 2018).

To summarize, the energy justice implications of a specific technology may vary depending on the ownership and size of the installation (e.g., rooftop solar PV vs. major solar farms, locally owned vs. utility owned district heating system), socioeconomic status of the technology user (income and education levels), and residence type (e.g., apartment vs. detached house, owner vs. renter). Support mechanisms focusing on the consumption/use stage may exclude low-income people unable to afford the investment in the first place. On the other hand, use of many technologies depends also on the availability of supporting infrastructures such as heating networks, EV charging infrastructure and internet connections. Finally, the potential environmental and societal impacts of green energy technologies during manufacturing and disposal stages should not be neglected.

7 General discussion

Among the multiple challenges ahead, climate change represents perhaps the biggest one since its fight will require massive and profound transformations as well as inevitable losses and reconfigurations. In order to achieve the Paris Agreement targets, it is paramount to accelerate the energy transition. However, a successful transition must be not only rapid but also *human and equitable* (Stavis and Felli, 2020) for all, especially for the most vulnerable individuals, social groups, and territories. Thus, the energy transition must be a Just Transition (JT) both in social and ecological terms and on a planetary scale. The achievement of a JT in the Anthropocene requires totally different approaches to nature and society by acknowledging historical power imbalances that led to what Sheller (2018) identifies as a Triple Crisis – climate change, migration, and urbanization – as well as the necessary structural changes required to address these entangled crises (Daggett, 2021). Understanding the energy dimension of the JT is a key-aspect to facilitate the emergence of an inclusive and fair process aimed at decarbonizing societies while empowering the weak and weakening the powerful (Stavis and Felli, 2020). Crucial to an inclusive and just energy transition is the active participation of citizens in the decision-making processes concerning energy systems, from production to consumption. The emerging concept of energy citizenship responds to this goal and represents an important new tool to enhance renewable energy literacy and foster practical experiences of decentralized and bottom-up energy management. However, if several studies have been investigating the potential of energy citizenship in terms of democratically engaging people as active participants in sustainable energy transitions (Devine-Wright, 2007; 2012), there is an urgent need to explore the justice dimension of energy citizenship and the multiple connections between energy transition, active participation, and potential reproductions of unjust and uneven socio-environmental consequences. Moreover, as this report showed, the exploration of the justice dimensions of energy citizenship initiatives is especially relevant for the emerging Energy Union, in which the participation of citizens and communities is considered at the core of socio-technical innovations of energy systems. Thus, tackling (in)justice issues of energy citizenship-based energy union by highlighting persons, efforts, winners and losers of the energy transition becomes interesting in order to map the many gaps and blind spots of transforming energy cultures (Sheller, 2014) as well as to understand how to address them in a non-universalist approach that “hide unequal responsibility for and obligation towards planetary inequality, consumption or environmental damage behind our common humanity” (Stavis and Felli, 2020).

This deliverable has been structured as an in-depth literature review aiming at building a solid knowledge about the implications of energy justice for energy citizenship emergence. D1.2 represents the second output of WP1 whose main objective is to provide elaborated concept and method in a harmonized way to establish a reference basis for all WPs. D1.2 is also crucial for the development of the other two tasks of WP1. With regard to Task 1.3, it provides a coherent background for

the design of protocols and guidelines to conduct the case studies. A homogenous framework based on energy justice theory and its implication for energy citizenship is fundamental not only to the research design but also to compare the results of case studies activities. Concerning Task 1.4 this deliverable contributes to inform with theoretical references the storylines and the parameters to build behavioural tests.

D1.2 has been organized into two main parts, each of them organized in sections. In the Introduction an outline of the purpose and the structure is given. The second section has dealt with an overview of the relation between Energy Union, energy justice and energy citizenship that has been given to understand why it is important to engage citizens and pursue an energy just transition. In line with deliverable D1.1, in the first part of the report we decided to shed some light on different energy and citizenship concepts by arguing that citizenship has a mobile, performative dimension (Isin, 2017). That means to approach citizenship not merely through juridical rights, but as “embodied, practiced and performed acts. [...] a process of becoming, involving a variety of cultural, social and spatial expressions” (Andersen et al., 2018, p.211). According to this perspective, energy communities can be identified as performative expressions of citizenship and explored as one of the many possible ways to navigate energy transitions by making both citizens and non-citizens to claim *energy rights*. Nonetheless, as discussed in 4.1 and especially in 4.1.3, energy communities too must be investigated through an energy justice lens. This helps to foreground the risks of (re)producing distributional, procedural and recognition injustices in the process of establishing an energy community, thus discouraging people to become active energy citizens and interfering with the aims of implementing a Just Transition for all.

The third section, the exploration of Energy Justice theory, allowed us to explain the origin of energy justice and to show how it developed from the experiences of environmental justice movements. Additionally, that part has taken into account how just energy policy and procedures can foster citizen engagement and participation in energy futures. Then, an analysis of how energy justice can enhance drivers and take away barriers has been conducted with the purpose of grasping the relation between energy (in)justice and involvement levels of energy citizenship. The fifth section has provided an investigation of how EU energy policies affect energy citizenship, particularly regarding local energy communities, considering these effects from an energy justice perspective. Precisely, this section has introduced the most relevant EU policies for energy citizenship presenting the relevance of energy justice for energy communities while connecting the two by outlining the impact of policies on energy citizenship with positive and negative examples.

In the second part, we explored and analysed how emerging forms of energy citizenship interact with the concept of energy justice. Notably, the purpose has been the reflection on how distinct levels and forms of energy citizenship are perceived and accepted as fair and just initiatives. This part considered the interrelation between energy citizenship and justice according to three main dimensions: gender, poverty and green technologies. Regarding gender aspects in energy justice, the section suggested to tackle participation in energy transition not just as a question of economic

capacities and a physical seat at the negotiation table. In this regard the gender lens allows to consider that gender affects the possibility to become active in energy transition due to different economic, social, and cultural capital (Stendal et al., 2020). Additionally, a feminist approach to energy systems has underlined that it is crucial to understand and make visible power dynamics in both the current and transition energy systems. However, there is still circumscribed research on the socio-political dimension of gender and how gender identities influence citizens' perceptions of new energy technologies, opportunities for participation in local energy initiatives, and energy use and accessibility in households that diverge from traditional assumptions of the traditional family unit (Healy and Barry, 2017). The section then has emphasized the need for further research to explore gender interaction with the development of energy citizenship. With respect to how energy poverty impinges on energy justice, the section has suggested that energy poverty should be addressed as a multidimensional problem since it implies environmental, economic, and social aspects. For this purpose, it is crucial to develop coherent measuring tools to identify and tackle poverty and achieve a just transition. Finally, the last section has dealt with justice implications of renewable energy technologies. Precisely, it has been pointed out that such effects depend on several factors: ownership and size of the installation; socioeconomic status of end-user; type of household. As a consequence, aid schemes based on consumption might exclude low-income people, who are unable to afford the investment in the first instance. Moreover, it has been emphasized that use of many technologies depends also on the availability of supporting infrastructures that are not equally guaranteed. Eventually, the environmental and societal impacts of green energy technologies during the whole supply chain, from manufacturing to disposal stages should not be neglected.

To conclude, the exploration and the analysis of the role that energy justice plays in energy citizenship emergence carried out in D1.2 represents a key stage for the design of a just policy framework to build operative policy recommendations in GRETA's WP6.

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