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**SOCIAL JUSTICE AND CLIMATE
CHANGE:
the distributional effects of EU climate
policies in addressing a sustainable energetic
transition**

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ABSTRACT

Wide-ranging, human-centered problems of justice are raised by the growing severity of the climate catastrophe and the fundamental role that the energy transition plays in reducing and responding to it. Making the difficult decisions required to handle the climate change challenge is significantly hampered by the specific characteristics of the issue. A number of global, generational, and theoretical issues are brought together by climate change. It is a "perfect moral storm," as this confluence merits calling it. One effect of this storm is that, even if the other challenging ethical issues surrounding climate change could be resolved, it could still be problematic for us to take action. Policymakers should make sure that all potential connections, positive and negative spillover effects, and distributional implications of a climate mitigation strategy have been examined during the design phase. To prevent negative results, government assistance and investment, such as subsidies, exemptions, and cautious intervention targeting, will be required. This thesis seeks to identify the distributional consequences of EU climate policies and to investigate how a justice perspective may rebalance the energy policy trilemma faced by the European Union.

Keywords: Distributional effects · Climate change · European Union · Climate policies · Energy justice

INTRODUCTION

As more ambitious policies are enacted globally, frequently leading to higher taxes on energy goods, the inclusion of distributional implications in the study of energy and climate policies is becoming increasingly relevant. This was seen in the recent Yellow Vest movement in France, which was characterized by widespread demonstrations against the rising gasoline taxes and the argument that the middle and working classes are bearing a disproportionate amount of the weight as a result of tax reforms. As income and carbon disparity rise, it poses questions about the sustainability of economic development and social cohesiveness, which could hinder efforts to combat climate change. In the end, the equitable implications of such policies strictly depend on how costs and benefits of climate policies are incurred and distributed in accordance with social and industrial links, national policy, and international agreements. There is also a connection between the perceived fairness of cooperative arrangements and the efficacy of cooperative activity. As a result, issues of equity and fairness started to get more attention in the literature on climate change, namely through the concepts of environmental justice, climate justice, and energy justice. Even though these methods usually perceive justice and equality as moral requirements, justice also serves the practical purpose of facilitating greater and more socially acceptable mitigating measures.

This thesis aims to study the relation between social justice and climate change when it comes to design policies to guarantee a just transition leaving no one behind. Equity issues are indeed intertwined with policies. Climate policy may have regressive distributional effects that disproportionately harm low-income and other disadvantaged populations. The distributional effects of environmental policies can differ greatly between and within nations, depending on the selected policy instrument and underlying socio-economic structure.

The analysis will start with a general introduction on the sociological and philosophical framework. Climate change is defined a slow violence, in the sense that it shows up through violent events “neither spectacular nor instantaneous”, revealing their catastrophic repercussions in the long term. This specific feature partly explains the reason why it is challenging for policymakers the process of law enforcement and policy interventions on the issue. In this regard, it will be taken into analysis the role of mass media in shaping public perception of climate change and consequentially, the political agenda. Then, the final section of the first chapter depicts a background of the inextricable relation between justice and poverty, and the necessity to balance the three core aspects of the energy trilemma, namely energy security, sustainability and energy affordability and access. Linking the concepts of justice and energy, this last point will introduce the central issue of the following chapters, namely the eventual distributional effects of climate policies in Europe. Since policy designs should

concentrate on the channels that are most pertinent for the specific nation or area, having immediate effects, being more similar from a socio-economic perspective, and having less ambiguous effects, this thesis will focus on the European Union.

The second chapter is aimed at providing a detailed analysis of EU climate policy's distributional effects, and particularly of some policy measures having distributional implications, such as carbon pricing, public investments and government regulations, subsidies, and industry standards. Moreover, it will be assessed through graphs the perceived effectiveness of climate policies by EU citizens: indeed, the potential effectiveness of these tools also depends on the public perception of them.

The third chapter undertakes the formulation of the main aspects influencing policymaking on the issue, that is, political perception, behavioral economic considerations, and EU governance. All these just mentioned aspects are to be taken into account while designing compensation policies. This chapter goes through four compensation strategies: lump-sum redistribution, broader tax reforms, Green Deal, and lastly progressive subsidies for purchasing green products.

CHAPTER 1: Sociological and philosophical framework

According to the Climate Vulnerability Forum projections, climate change yearly causes 400.000 deaths due to hunger and diseases, and by 2030, this number could rise to 700.000 deaths per year (Dehm, 2020). Most of the population growth occurred in non-OECD countries; however, the OECD region continues to lead the global economy. Most of the economic activity and the share of consumption is still concentrated in the OECD countries, even though historically, most global output has been situated in OECD countries. Indeed, the OECD nations made up just 18% of the world's population in 2010, but they produced 74% of the world's income. This data demonstrate the enormous scope of global inequality, distorting how the advantages of the Great Acceleration are distributed and complicating efforts to mitigate its effects on the Earth System (Steffen et al., 2015).

Therefore, the discrepancy between those responsible for the problem and those most at risk from its destructive effects makes climate change a global social justice and equality issue. In this respect, it becomes imperative to raise societal awareness of the worldwide impact of climate change as a form of injustice and violence, to hold historical polluters accountable, and to give reparative measures to the victims of environmental injustices, making them more visible (Nixon, 2011).

Firstly, to get a sense of the convergence of several global, theoretical and intergenerational issues that climate change concerns, it is crucial to look at a philosophical overview of Gardiner's Perfect Moral Storm (2006). This explains why, even though some challenging questions on climate change can be addressed, it might still result difficult to act for policymakers. Then, it will be provided an overlook of the so-called slow violence of climate change, a form of violence "neither spectacular nor instantaneous" that show its catastrophic repercussions in the long term, making it difficult for law enforcement and policy interventions on the matter. In this regard, it will be analysed the role of media in shaping our perception of the issue as well as the political agenda. Finally, it will be offered a quick background of the inextricable relation between justice and poverty, and the necessity to balance the three core aspects of the energy trilemma, namely energy security, sustainability and energy affordability and access. Linking the concepts of justice and energy, this last point will introduce the central issue of the following chapters, namely the eventual distributional effects of climate policies in Europe. Because of the complex nature of the challenge of tackling the climate crisis, policies need to be intrusive and as such, they could cause several side effects, depending on the specific policy design and the starting socio-economic situation of a country. This explains the aim of this thesis to focus on the particular context of the European Union, allowing a more cohesive overview of the distributional nature of its current policies in the second chapter and how to address their distributional effects in the third chapter.

1. Climate Change as a Perfect Moral Storm

The starting premise concerns stating the reason why climate change is a global issue by invoking its ethical considerations, involving a certain degree of moral responsibility. Indeed, if we do not believe that our actions are always subject to moral assessment and that even what is out of our sphere of influence (namely far people, nature and future generations) matters, it is challenging to conceive climate change as a problem and develop possible solutions through policies.

The specific features of climate change cause substantial obstacles to our capacity to address the issues with the appropriate policies. Due to the issue's complexity, it has been defined as a "perfect moral storm", a definition coined by Gardiner (2006). Even if the complex ethical concerns could be resolved, taking action could be challenging since we are incredibly susceptible to moral corruption because of the storm. Gardiner identifies the three main storms in the dispersion of causes and effects, the fragmentation of agency, and institutional inadequacy, which are manifest in the temporal and spatial dimension.

Firstly, concerning the dispersion of causes and effects, global greenhouse gas emissions move from the Earth to the higher atmosphere, eventually influencing the global climate. As a result, the effects of any given emission are not felt simply at the individual or geographical real source but actually spread out to other participants and geographical areas on the planet.

Secondly, the second storm concerns the fragmentation of agency. The cause of climate change cannot be found in a single actor but in several global players, such as citizens and institutions. Indeed, given that a global government system does not exist, coordination for an effective solution to global climate change is challenging.

This brings the reasoning to the third feature: institutional inadequacy. There is widespread agreement that changing the current incentive structure by introducing an enforceable penalty system is the most effective solution to resolve common concerns. However, a utopic global agreement should take into consideration other complexity, among which scientific uncertainty concerning the exact magnitude and localisation of the effects of climate change. Moreover, the source of the issue profoundly lies in the structures of human civilisations; thus, all the efforts to counteract they may have significant effects on human social life's ramifications. Human activity produces greenhouse gases, notably carbon dioxide, exacerbating climate change through fossil fuels burning to produce energy.

Nonetheless, it is this energy that keeps the current economy going. We may thus anticipate that such action will have significant consequences on the fundamental economic structure of the wealthy nations as well as on the ambitions of the developing countries especially considering that preventing

climate change would require large cutbacks in estimated world emissions over time. It follows that negative interactions exist between the problem of climate change and the current global power system. The poorer nations need to be better positioned to hold the more prosperous and powerful nations accountable because they bear most of the blame for historical and current emissions. Another reason is that the weaker countries are more susceptible to the worst effects of climate change, according to the scant information on regional effects.

Lastly, addressing climate change exposes wealthy countries to an ethical risk. It affirms the belief that international collaboration on matters requiring such norms is both possible and required and expresses the understanding that there are international standards of ethics and accountability (Gardiner, 2006).

2. The out of sight and steady Slow Violence of Climate Change

As aforementioned, the principal value of social studies regards justice: hence, it also includes the issue of environmental degradation, currently affecting especially poor countries. With the same belief that environmental deterioration and power disparities are related, this section will provide a conceptualisation of the slow violence of climate change as linked to the environmental justice movement (Martinez-Alier, 2014; Nixon, 2011).

Broadly speaking, climate change is a worldwide injustice (Beck, 2010): even though they contributed little to the global issue of global warming, people experiencing poverty in developing nations are those who suffer the most from its adverse outcomes (Basher, 2008; IPCC, 2014). Consequently, communities that are severely impacted by climate change must adapt to it to survive (The Green Belt Movement International, 2009); however, many of these communities are under-resourced and therefore have limited capacity for risk reduction or response (IPCC, 2014; World Bank, 2012). Indeed, few resources are provided to populations affected by climate change in wealthy industrialised nations that caused the issue by exploiting fossil fuels to sustain their ever-growing economies.

According to the World Bank's estimate in the most recent Intergovernmental Panel on Climate Change (IPCC) comprehensive report (IPCC, 2014), impacted poor nations will require \$100 billion per year to deal with the consequences of climate change. Nevertheless, due to criticism from industrialised economies who claimed that doubling foreign aid is unrealistic in the current economic context, this statistic was removed from the shorter summary delivered to all global leaders (Gillis, 2014). As a result, because of this IPCC report omission negatively impacted poor nations, this

constitutes an example of how environmental injustice is exacerbated through the process of slow violence.

The idea of slow violence was introduced by Nixon (2011): it is shaped by structural violence, which expands the understanding of violence beyond individual actions and instead focuses on how power and systemic violence result in inequalities (Galtung, 1969). Slow violence broadens the definition of violence to include the complexity of the phenomena that occurs gradually over time due to environmental changes (Holterman, 2014). Indeed, slow violence is defined as “a violence that occurs gradually and out of sight, a violence of delayed destruction that is dispersed across time and space, an attritional violence that is typically not viewed as violence at all”.¹ Violence is generally considered as a sudden, explosive, and dramatic incident or action that explodes into immediate sensational visibility. In contrast, climate change is viewed as a form of slow violence because its effects are not immediately noticeable. For instance, the gradual increase in global temperatures caused by climate change leads to the gradual expansion of deserts, a delayed and less visible environmental problem compared to a tsunami or earthquake with immediate and visible effects. Consequently, according to Nixon (2011), we need to engage in a different type of violence, whose catastrophic effects are felt across a variety of time scales and which is neither dramatic nor instantaneous. The relative opacity of slow violence presents representational, narrative, and strategic issues that must also be addressed in this process. A number of slowly developing environmental catastrophes, including climate change, the thawing cryosphere, toxic drift, bio-magnification, deforestation, radioactive fallout from war, and acidifying oceans, just to name a few examples, pose formidable representational challenges that may hinder our efforts to mobilise and take decisive action.

Poor communities, the primary victims of slow violence, are made more vulnerable by our media’s bias and predisposition toward spectacular, violent acts. Their hidden poverty is made more severe because of slow violence’s invisibility. Hence, inequities of class, gender, race, and location also disproportionately afflict people experiencing poverty in emerging nations, who are also the principal victims of environmental injustice and slow violence (Nixon, 2011). The associated repressive systems of the specific setting, such as market fundamentalism, sexism, racism, ethnocentrism, and repression, must thus be considered in analyses of slow violence (Holterman, 2014).

¹ Rob Nixon, *Slow Violence and the Environmentalism of the Poor*, Harvard University Press (2011), 2.

3. Click-bait media shape our indifference towards invisible victims

Building on the idea of our inattention to calamities that happen slowly and in the long term due to the current veneration of instant spectacle, this section illustrates that these calamities patiently dispense their devastation while remaining outside our attention spans and consequently outside the purview of a spectacle-driven corporate media.

To begin with, ecology can be defined as the interaction of a collection of living organisms and their surroundings. The word is typically used in environmental and biological contexts, such as when discussing climate change as a danger to natural ecosystems. Likewise, media are generally considered environments in the same sense. Indeed, media ecologies, like any natural ecosystem, are comprised of several types of media (mainstream, national, local) and media players (producers, intermediaries or consumers) with different levels of power and impact within a specific media ecosystem (Scolari, 2013). It follows that, linked to the concept of slow violence, we can name two types of ecologies. On the one hand, the so-called natural ecology, which includes ecosystems, environmental landscape, greenhouse gases or pollution, concerns ecology in the materialist sense, where slow violence resides. On the other hand, media ecology is the study of technology, media, and information and how they affect human environments. It moves faster than natural ecology: indeed, through social media, every piece of information rapidly flashes but then dies down at the same speed as it went viral, thriving on more sensational and spectacular events and travelling faster than accurate information (Gerspacher, 2022).

Furthermore, slow violence challenges us to think more broadly about what harm is. It entails that we consider violent acts seriously, even if they have drifted away from their root reasons over time. Slow violence necessitates that we go beyond the immediate, the visceral, and the evident in our investigations of social injustice, from progressively acidifying oceans to the incremental horrors of climate change to a multitude of other “slowly unfolding environmental calamities” (Nixon, 2011: 2). Slow violence urges us to integrate the incremental deaths, destructions, and deep deposits of unequal social brutalities inside the territorial here-and-now as a spatial term. How can we make sense of long-form catastrophes in a click-bait and frenetic world when devastation is silently accrued over time rather than manifesting itself in a sudden, dramatic moment of terror? How can the immediacy of more cinematic dangers compete with the delayed brutality of microplastic pollution, endocrine disruptors, antibiotic resistance, and numerous other technical hazards with severe consequences on society (Davies, 2022)?

As McCombs et al.’s study of the political function of mass media showed, media coverage of an issue can “play an important part in shaping political reality” (McCombs and Shaw, 1972). Research

into media coverage of climate change has demonstrated the media's significant role in determining climate policy formation (Boykoff, 2007). The media has considerable bearing on public opinion, and the way in which issues are reported, or framed, establishes a particular discourse (Hajer and Versteeg, 2005). Scholars have stated that the media's construction of climate change discourses has not yet generated the political will necessary for immediate action. A potent conceptual emblem in the struggle against climate change is the polar bear. However, such images may create a perception of climate change impacts as geographically distant (Lorenzoni and Pidgeon, 2006), and MacNaghten (2003) argues that climate change needs to be framed as an issue 'closer to home'. On the other hand, Beck (1992) suggests that a significant benefit of global media is that it brings distant issues into our consciousness. Indeed, the news may impact public concern about climate change by raising levels of news media attention to it (Sampei and Aoyagi-Usui, 2009).

4. The subtle link between justice and energy

The following paragraph will focus on a conceptualisation of the previously mentioned issue of justice and energy security. Combining in the same sentence the words and particularly the disciplines of "energy" and "justice" may seem peculiar. The philosophical framework of energy justice apparently contradicts global governance based on hard politics, geopolitical interests and globalised social structures. Nonetheless, many ethical issues emerge due to the severe threat to our social livelihoods posed by climate change and its effects, such as energy insecurity.

Energy demand and consumption worldwide have significantly increased and are estimated to keep doing so (Tonn, Eisenberg, 2007), especially in nations experiencing rapid economic growth: for instance, China and India. By 2040, the U.S. Energy Information Agency (EIA) forecasts a 28% rise in global energy consumption (Dorman, 2017): suffice it to know that in 2017 alone, global energy demand experienced a growth of 2.1%, which is twice as much as in the previous year. As a result, the need for more energy services and the burden on already-existing services will rise as climate change worsens (IEA, 2018). Maintaining both individual and population-scale health and well-being depends on ensuring that household energy is affordable, accessible, and produced in an acceptable amount. Cooking, lighting, heating, cooling, cleaning, as well as technical, medical, and other life-sustaining equipment, are all household energy uses (Rehfuess, 2006). Nonetheless, millions of homes worldwide lack enough energy to function. Inadequate infrastructure, cost issues, and service interruptions brought on by natural disasters and extreme weather conditions—often caused by climate change—make it challenging to have enough access to electricity: this situation has been defined as "energy insecurity", namely the "inability to meet family energy needs effectively". The

paradigm for energy insecurity covers behavioural, economic, and physical aspects that contribute to or exacerbate negative health consequences (Hernández, 2016).

As was pointed out above, the fiscal regimes of both developed and developing nations are now experiencing a significant structural change. This is partly because economic activity produces environmental externalities that lead to issues like climate change. Final consumers, who may endure, among other things, higher energy costs - either because corporations indirectly transmit the cost of “carbon taxes” to the final bill, or owing to direct levies on energy service-paying customers - are severely affected by the shift toward environmental taxation. Therefore, during the past ten years, the connection between energy use and “climate justice” has attracted substantial scholarly attention and policy debate (Bulkeley, Castán-Broto, and Maassen, 2011).

The combination of factors such as low household incomes and residential energy efficiency, as well as current high-energy prices, has contributed to the development of energy poverty.² However, policies on the issue do not concern just distributional matters, namely consumption, energy prices, or income, because more general geographical, social, and institutional variables also influence a household’s failure to get enough energy services. Indeed, for the development of effective policies in terms of procedure and distribution, it is essential to introduce the role of justice to shape the energy-poverty nexus (Walker and Day, 2012).

5. The normalisation of energy injustices and how to address them

This paragraph summarizes the present state of the global energy system from production to consumption before detailing the European framework for energy justice. It offers the reader some fundamental assumptions on energy. Of relevance to some of the discussion provided in the paragraphs to follow is the link between climate change and energy insecurity. Climate change harms both the direct and indirect health consequences of energy insecurity, and it also worsens the cumulative risk. This means that the most vulnerable citizens or companies who are already affected by energy insecurity are consequently more negatively impacted by climate disasters since they own fewer resources to prevent, to counter or to recover from these events (Fothergill, Peek, 2004). To illustrate, the mortality rate during heatwaves is disproportionately distributed, negatively affecting older people, minority groups, and low-income citizens, namely groups that are not sufficiently equipped to handle high temperatures from a social, economic and psychological point of view (Klinenberg, 2003).

² Energy poverty can be defined as a condition in which “an household cannot meet its domestic energy needs” (Bouzarovski et al., 2020)

It is difficult for consumers, researchers, and decision-makers to recognise and address the harmful effects of energy decisions and the unequal distribution of costs, risks, and vulnerabilities across multiple levels of governance, supply chains, political jurisdictions, and international boundaries (Kuzemko, Lockwood, Mitchell, and Hoggett, 2016). To highlight the several but mostly unnoticed “sacrifice zones” and cross-scalar socio-environmental justice effects of the world’s fossil fuel-dominant energy regime, a closer investigation of the lifecycle implications of energy production and consumption systems with their embodied inequalities in the supply-chain system is required (Sovacool, Burke, Baker, Kotikalapudi, and Wlokas, 2017). It results to be essential since taking into account such energy injustices can — or, at least, should — change the costs and benefits of proposed energy initiatives and infrastructure decisions, along with policymakers’ capacity to defend their choice in light of that balance (Burger, Wentz, 2017). For instance, in the last decades, the production of energy has shifted across borders, causing a growing gap between countries that are producers or consumers of energy. People consuming energy in importing countries are affected by the so-called “consumer blindness”, namely their unconsciousness of where the fuels they employ are coming from and, mostly, on the conditions under which the production occurred. The energy extraction phase encompasses the phenomenon of environmentally displaced populations and the slow violence of environmental damage or water contamination (Healy et al., 2013). Thus, in order to clearly consider hidden and remote injustices resulting from the extraction, processing and disposal of energy resources, the new notion of embodied energy injustices offers an efficient tool to link the challenges of transboundary energy injustice with policies on energy infrastructures. Indeed, the term broadly refers to all the transboundary injustices from a social and environmental perspective, which are connected with energy policy decision-making. Embodied energy injustices can be both measurable as unequal ecological degradation, or severe and uneven environmental health consequences, and non-quantifiable, as slow violence or infringement of human rights. The fundamental principles of radical politics, according to Cahntal Mouffe, include the “definition of an adversary” (Mouffe, 1998) and holding those liable for injustices to account. Hence, the key to how embedded energy injustices might promote political action aimed at addressing energy injustices is “making them visible so that they can enter the terrain of contestation” (Mouffe, 2000). New solidarity movements can be sparked by linking local energy conflicts to far-off transnational social effects.

To conclude, the primary challenge of the energy transition can be synthesised with the concept of energy trilemma, assessing the complex and contradictory balance between energy security, energy equity and environmental sustainability (World Energy Council, 2020), that any government wishes to achieve. Energy security refers to a country’s ability to reliably meet current and future energy needs without overly relying on any one energy source, as well as the resilience and dependability of

its energy infrastructure. Access to affordable and reliable energy for domestic and commercial use constitutes energy equity (Miyanaga, 2021). Consequently, it may become a good approach to address the issue since it is supposed to find simultaneous and broader solutions, combining poverty, climate change and economic growth (Grigoryev et al., 2020).

6. The fuel to the European energy crisis is injustice

After providing a sociological and philosophical perspective and a general introduction on the energy issue and its implications, this section will deeply focus on the European scenario from the energetic point of view.

Since the beginning of the European project, the energy issue has always been strictly connected to European history, becoming a symbol of unity in the Union. The benefits of collaborating on coal after World War II defeated nationalist feelings and led to the formation of the European Coal and Steel Community, a union that would later develop into the European Union (EEB,2022). This alliance demonstrates that through common sense, Europe developed a project that would positively shape his shared future. Nowadays, the ability of European, intrinsic in their history, to once again cooperate closely on energy issues—and to meet a new remarkable challenge—will impact the speed with which they can phase out coal and other fossil fuels.

However, Europe is currently experiencing a perfect storm. The structural vulnerabilities in the European energy market were exposed from the beginning of the conflict in Ukraine, but they have been present in the EU's energy picture for several decades. Energy price, energy security, and sustainability are the three fundamental axes of the energy trilemma. Throughout the past 20 years, securing energy supplies, particularly gas, at the lowest price feasible has been the central focus of the European energy strategy. The Russian Federation has been the primary source of affordable gas for a major fraction of this time; in 2021, it supplied 45% of all gas exported to Europe and 40% of European gas consumption.

Energy and the transition to a clean energy future are among the industry sectors most impacted by the conflict. The war and the threats it poses to the world's gas and oil supply serve as yet another reminder of the importance of fossil fuels in the current energy balance and expose the limitations of the slow pace of the transition to renewable energy sources. The decision to gradually remove Russian gas from the EU's energy mix and the partial ban on Russian oil, which comprised around 29% of all European oil imports, have a significant short- and medium-term impact on businesses and households. In fact, the battle has emphasised how geopolitical tensions affect fossil fuels and the

crucial role that countries with abundant fossil fuel resources play (Between Transition and Security: The EU's Response to the Energy Crisis | ISPI, 2022).

According to current estimates, in Europe, the number of people living in energy poverty has risen dramatically from 34 million before the energy crisis to the current 80 million. Real wages in the Eurozone are severely decreasing, making working-class Europeans 3% poorer and according to Eurostat, in the energy section of inflation, there has been an increase of 50% in Europe in the last two years (Meynen, 2022). Therefore, energy poverty is a matter of growing policy attention by the European Union, since it constitutes an essential precondition to achieve a just and sustainable transition. Consequently, the European Commission, after the European Parliament's request, established the Energy Poverty Advisory Hub (EPAH) in late 2021 in response to high gas costs. The goal of the EPAH is to solve energy insecurity and hasten the just energy transition of European local governments. Demands for addressing energy poverty voiced by grassroots movements and civil society have distinctly shown the distributional implications of energy pricing as well as the necessary next steps. Policy measures do prepare the path to start addressing the ongoing energy insecurity, despite being severely constrained in terms of financial resources, albeit more work still has to be done (EEB, 2022).

7. Key issues of climate policies to fight injustices in the European Union

Of relevance to the primary discussion provided in the chapters to follow is the European Union's approach to deal with the socio-economic effects brought by climate change and eventually its mitigation policies.

To begin with, in its report Employment and social developments in Europe 2019, the European Commission made explicit its engagement to tackle climate change-related inequalities, stating the following: "Attention to social and environmental inequalities and distributional impacts of climate action is important for ensuring that the burden is fairly distributed across individuals, groups, sectors and regions".

Since more action is required to avoid and mitigate the consequences of climate change, the issue, along with the shift to a climate-neutral economy, is a particularly delicate matter on the European Union (EU) policy agenda and, consequently, of his Member States. As in the case of other categories of policies, climate measures and policies may lead to adverse socio-economic effects. Hence, it is crucial to examine how these policies' outcomes affect citizens, organisations and corporations, paying particular attention to those groups who can be more negatively impacted either by the causes of climate change and the policies implemented to lessen the damage they cause (Eurofound, 2021).

Policy changes are considered vital and urgent because the well-known consequences of climate change are already experienced worldwide and further escalation of these negative effects must be prevented. Even during the COVID-19 pandemic, the European Union has acknowledged the urgency and significance of taking action on climate change. Indeed, the largest ever portion of the European budget, which is 30% of the total EUR 750 billion EU pandemic recovery fund, has been allocated to tackle climate change (European Commission, 2020).

However, as previously mentioned, it is extremely probable that several socio-economic groups would be disproportionately affected by the development of environmental policies. For instance, according to various studies, the carbon tax tends to cause regressive distributional effects, making low-income households worse off relative to high-income ones, and exacerbating existing disparities (Eurofound, 2021). This negative influence on the quality of life of the most vulnerable groups could result in political opposition to the climate project and a decline in public support for taking action on climate policies. Hence, according to Zachmann et al. (2018), it is essential to consider how climate policy affects distribution and if aggressive decarbonisation efforts result in clearly rising disparities, policymakers should not accept them.

Nonetheless, the consequent reform process theoretically needs to maximise social welfare and gain political support, but Roland (2000) highlighted the inherent challenge in its implementation, also considering the correlated costs and uncertainty concerning the eventual future benefits of the reform. Social reforms frequently run into a so-called “hold-up problem”³: While the winners constitute a majority of the population, who are not only uncertain about the gains but also expect few gains on an individual basis because gains are supposed to be distributed across the population, the losers are typically a minority group that can precisely calculate its losses.

The French movement of the “gilets jaunes” (“yellow vests”) represents a recent and remarkable example of public discontent related to the issue of climate change. To contextualise it, the movement took shape in 2018 in France through an online petition signed by almost one million signatures. It was aimed at organising large-scale protests against the uneven burden of tax reforms, which included carbon taxes⁴, implemented by the French government, on a specific portion of the population, that is, working and middle class and most citizens of rural and peri-urban areas of the country. This case highlights the importance of policymakers to account for the distributional effects of climate policies

³ The hold-up problem occurs when two parties could cooperate most effectively together, but they choose not fearing that doing so could offer the other party more negotiating leverage and consequently, lower their own profits.

⁴ The “carbon tax” is based on the “polluter pays” principle (that is, the country which pollutes the most pays the costs of control and prevention of environmental damage).

across distinct socio-economic groups or eventually to develop strategies in order to deal with the unintended consequences (Eurofound, 2021).

CHAPTER 2: Distributional effects of environmental policy measures in the European Union and their perceived effectiveness

The previous chapter provided a brief overview of the key issues of environmental policies and their implications, along with a general introduction to the philosophical and sociological framework of climate change-related injustices especially in the energy field.

This chapter aims to contribute to the debate on the relation between social justice, social and environmental policies as well as provide a detailed analysis of the literature on climate policy's distributional effects in the context of the EU's efforts to reduce greenhouse gas emissions. Particular focus will be devoted to the way the components of policy designs that try to address both competitiveness on a macroeconomic level and distributional issues on a social level interact with one another. While concerns about competition may be the main factors in the decision to auction or grandfather emission permits, there may be unforeseen repercussions for how revenue is distributed among households. To explore the nature of EU climate policies in the sphere of social justice, this chapter will then proceed with an analysis of some policy measures having distributional effects, namely carbon pricing, public investments and government regulations, subsidies, and industry standards.

Finally, the last section of this chapter will be devoted to the overview of the perceived effectiveness of climate policies by EU citizens. To get a sense of the differences in perceptions on the effectiveness of these policies, it is crucial to assess that the potential of these tools also depends on the public perception of them. Indeed, it is more unlikely that the implementation will be beneficial in nations where there is a significantly negative perception and consequently, actors may have the incentive to free-ride. To explain the changes throughout EU member states, the section will explore two factors, that is, the level of corruption and economic inequality.

1. Who pays for climate mitigation?

In the future decades, greenhouse gas emissions must be significantly decreased to prevent the catastrophic effects of global warming. Indeed, in the Paris Agreement, 195 countries agreed to “*reach global peaking of greenhouse gas emissions as soon as possible*” and “*achieve a balance between anthropogenic emissions by sources and removals by sinks of greenhouse gases in the second half of this century*” (UNFCCC, 2015).

Such an ambitious and profound decarbonisation project will certainly result in extensive consequences for the European Union. To illustrate, by about 2050, no Member States will be allowed

to employ coal, oil, or gas to heat homes, power vehicles, or produce electricity unless lower emissions offset this. The primary industrial sectors will need to figure out how to cut the greenhouse gas emissions that are now strictly related to their production procedures. The agricultural industry will progressively play a more significant part in decarbonisation goals because it has been mostly ignored up until now. Moreover, in the coming decades, we will start to figure out how "*negative emission technologies*."⁵—currently largely hypothetical—could look like in practice.

Indeed, environmental and climate policies are no different from other public policies in that they all have distributional impacts. Even though the UNFCCC (*United Nations Framework Convention on Climate Change*)’s Article 3⁶ specifies that the environment should be protected and preserved on the basic principle of equity and in compliance with each country’s respective capacity (UNFCCC, 1992), the primary objective of climate policies is the decrease of polluting emissions and, therefore, collateral effects on equity social justice are frequently not taken into account. The idea that pollution should be priced or regulated in order to increase societal welfare implies that someone must pay the price (Coase, 1960). The "ideal" standard of the “polluter pays principle”, which is the widely recognised ethical foundation of environmental policies in many countries and means that polluters pay the social consequences of their conduct, differs radically from the distributional status quo of climate policies (OECD, 1972). The fact that the poorest communities, who work and live close to the most polluted areas, typically suffer the health consequences of pollution makes the status quo more uneven: this phenomenon is called the environmental justice gap (Banzhaf, Ma and Timmins, 2019; Mackie and Hašič, 2019). Additionally, the extensive use of renewable energy subsidies (such as those destined to home weatherisation or electric vehicles) disproportionately benefits wealthier households, highlighting the inequality of current environmental policy. Moreover, the public's perception of the effects influences policy as much as the actual distributional effects (Dluhosch, 2018). This emphasises the need to make sure that the distributional implications of climate policy are accurately represented in the public discourse.

Ministries or departments of the environment are responsible for implementing these climate policies. These organisations typically incorporate information on the environmental implications of policies and how they affect different demographic groups in their studies and assessments. However, the

⁵ “Negative emissions technologies” (NETs) are employed to remove greenhouse gas emissions—mainly carbon dioxide—directly from the atmosphere: for instance, engineered solutions, such as direct-air capture (DAC), bioenergy with carbon capture and storage (BECCS), or afforestation (that is, the increase of CO₂ natural absorption).

⁶ “[...] Policies and measures to deal with climate change should be cost-effective to ensure global benefits at the lowest possible cost. To achieve this, such policies and measures should take into account different socioeconomic contexts, be comprehensive, cover all relevant sources, sinks and reservoirs of greenhouse gases and adaptation, and comprise all economic sectors.” (UNFCCC, 1992, art.3)

distributional impact of decarbonisation needs to receive the necessary attention in academic and policy discussions, which often inhibits the action of these departments. Some EU countries (i.e. Estonia or Finland) have acknowledged the issue as a top priority on the agenda, but often because of impediments such as insufficient funding and a lack of assessment techniques, there is a lack of action (Eurofound, 2021).

2. Policy measures with distributional effects

Several research and reports attempted to assess the progressive or regressive⁷ character of some policy action to reach the NECP (*National Energy and Climate Plans*) goals. Specifically, this section will focus on outlining the following policy measures and their respective distributional implications: carbon pricing, public investments and government regulations, subsidies, and industry standards.

Carbon pricing

As many economists claim, carbon pricing is the most effective solution to lower emissions, encouraging consumers and producers to adapt their behaviours to reach this ambitious objective (Cramton et al., 2017). Generally, depending on the degree of consumption baskets and on households' marginal propensities variation between income levels, this tool results in direct distributional consequences (Battistini et al., 2022). Since low-income groups typically spend a larger percentage of their disposable income on carbon-intensive products, they will be consequentially disproportionately impacted by a regressive carbon tax (Andersson & Atkison, 2020). Moreover, the carbon footprint of high-income groups is often higher than that of low-income households per capita. This phenomenon is frequently referred to as **carbon inequality** and raises issues regarding housing and transportation's consumption, as shown in Chart 1. It shows data for income quintiles in European MS, where "1" represents the lowest and "5" the highest income households groups (Ivanova and Wood, 2020).

⁷ The distributional effects of climate policies can be either regressive if they have a negative impact on low-income households or low-revenue companies or progressive if they have a positive effect on them. If all socioeconomic groups and companies equally benefit from the policy, it is called 'proportional'.

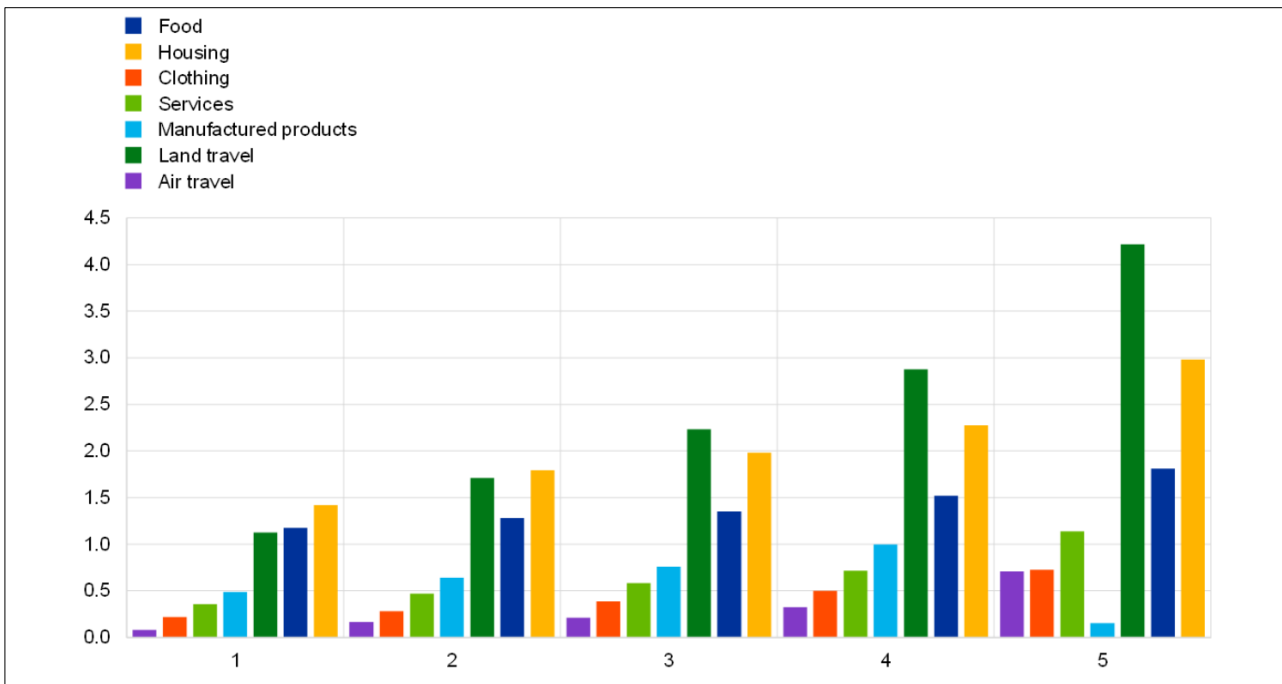


Chart 1 – Carbon footprint in the EU by income group (tonnes of CO₂ per capita, 2019)

Sources: Ivanova and Wood (2020), op. cit. and own calculation

The two procedures to implement carbon-pricing concern price-based instruments, such as the well-known taxes or quantitative mechanisms, where a restricted number of emissions allowances are granted, and the market then decides how much each allowance will cost (Zachmann et al., 2018). The two primary distributional consequences of carbon pricing are both an increase in product prices as a result of making it more expensive for producers to pollute and a change in the return on the factors of production (particularly labour and capital). The first consequence is often regressive since lower-income households cannot move to less emissions-intensive alternatives and spend a larger proportion of their income on various emissions-intensive products (such as heat and electricity). Given that high-income households possess most of the capital assets with high emissions that lose value during the transition, the second effect is more likely to be modestly progressive. Nonetheless, high-income people do also own capital assets like stock in wind turbine producers that may appreciate in value as carbon prices rise.

In the following paragraphs, it will be reviewed the literature on the distributional effects of carbon pricing in the field of heating, electricity, and road fuel.

2.1 Heating

Regarding the distributional effects of taxes on residential heating, both Tovar Reaños and Wölfling (2018) and Flues and Thomas (2015) conducted an analysis that found out the regressive nature of heat taxation. However, according to Tovar Reaños and Wölfling (2018), the welfare loss brought on by heat taxes is two to three times more than the welfare loss brought on by electricity bills. In contrast, Flues and Thomas (2015) argued that taxes on electricity typically tend to be more regressive than taxes on fuel for heating. On the one hand, it may seem logical to assume that heating taxes are highly regressive because low-income households may reside in buildings with poor insulation. On the other hand, Flues and Thomas (2015) point out that these taxes may actually be partially regressive since low-income households are more prone to (a) live in smaller houses or apartment buildings, consequently requiring less heating; (b) react to rising costs employing less heat by warming only part of the house or switching off the heating when going out.

2.2 Electricity

This paragraph will seek to analyse the distributional effects of taxes on electricity, whose market price in Europe is significantly influenced by the cost of fossil fuels. This happens because of the market structure, which promotes pricing based on marginal costs of production in the short-term, determined mainly by fossil fuels. Indeed, the whole category of fossil fuels, including oil, natural gas, and coal, are subject to trade in the global markets; therefore, their prices are set accordingly to the global demand-supply curve's changes (Zakeri et al., 2022). Denmark experienced different impacts of the carbon tax and excise taxes on households with several income levels, industries, and geographic locations. Excise taxes on energy commodities, such as mineral oil, gas, coal, and electricity, have a regressive effect since low-income consumers spend a proportionately higher share of their disposable income on energy taxes than higher-income households do. In 2018, Tovar Reaños and Wölfling conducted a particular⁸ case study on Germany. The result of the research outlined that an electricity price's rise inevitably has regressive outcomes. Indeed, as estimated through the Gini coefficient⁹, an increase of 20% in the price leads to an augmentation of inequality's rate by almost 0.24%. Furthermore, following the rise in electricity prices, low-income households are more prone to lower their electric consumption than high-income ones.

⁸ It is a particular case because the research employed an innovative econometric method, allowing to distinctly analyse the demand for electricity and heating.

⁹ The Gini coefficient (or Gini index) measures the number of inequalities through the value of frequency distribution within a nation or social group. A Gini coefficient equal to 0 indicates a situation of perfect equality, whereas a Gini coefficient equal to 1 means maximal inequality.

2.3 Road fuel

Almost a quarter of Europe's emissions of greenhouse gases come from the sector of transportation, which is also the largest contributor to pollution in urban areas. Moreover, the transport industry constitutes one of the few fields of the EU economy where emissions are still over 1990 levels. Specifically, road transport consistently ranks as the greatest emitter, accounting for more than 70% of all GHG emissions from transport in 2019 ("Transport Emissions," n.d.). Hence, it is a primary sector for decarbonisation policies; however, the possible increase in the price of carbon emissions is a debated matter. As little academic literature exists on the specific distributional effects in the case of road fuel taxation, we will focus on gasoline and diesel taxes since they have similar outcomes to carbon taxes on road fuels. On the one side, Dumagan and Mount (1992) argued that gasoline taxation is regressive; on the other side, Tiezzi (2005) claimed that in Italy, the 1999 carbon tax resulted in a disproportionate impact between high and low-income households, with the former losing more from it. This happened because high-income households are more likely to possess a car. Similarly, West (2004) claimed that gasoline taxes generally affect low-income and high-income households differently, being progressive for the former and regressive for the latter.

Government regulations

To reach the ambitious goal of a just transition to carbon neutrality, EU Member States have also introduced several regulatory measures performed through acts or by introducing standards in the production process of companies (see 'Industry standards' below). For what concerns energy efficiency measures and the growing use of renewable energies, in France energy saving certificates for buildings have progressive effects since they will, at least partially, help low-income households; housing prices' rise is estimated to be countered by regulating energy costs. Moreover, removing the requirement for solar energy panels' building licences has demonstrated to have a progressive impact on Sweden's energy sector. A relevant case that is worth mentioning is the adoption of the 2019 national climate agreements in the Netherlands to reach its 2030 climate goals. The agreement is made up of regulatory policies, measures to achieve citizens' awareness of the issue and voluntary changes in daily behaviours as well as agreements between companies in the fields of electricity, construction, transport and agriculture. Researchers and projections indicate that these national agreements have contributed to minimising the already minimal distributional consequences of the present climate policies.

Industry standards

Standards are regulations or laws that restrict or outlaw products with specific features, such as those with excessive energy consumption or emissions. The following categories characterise this type of

measure: sectoral standards, energy management and cost-cutting, and technology used in the production process.

2.1 Sectoral standards

The measures of this category primarily concern the agriculture sector, which is the second emitter of GHG after the energy sector. Although having an overall equivalent disposable income of more than 150 percent higher, households with the highest incomes only spend 19% more on food than those with the lowest incomes. Thus, lower-income households may be more negatively impacted by higher food prices caused by climate policy than higher-income households. Nevertheless, food preferences change; therefore, climatic policies will impact the cost of several agricultural goods differently. As emissions from this sector are controlled, carbon-intensive food products will probably become disproportionately more expensive. For instance, according to Opio et al. (2013), the greenhouse gas emissions from processing one kilogramme of beef can reach 70 kilogrammes of CO₂ equivalent. A carbon tax of \$30 per tonne would therefore raise beef costs by 7% at a price of \$4 per kilogram. The impact of an equivalent carbon tax on vegetables would be insignificant. Hence, considering the difference in price for several food products, the main hypothesis regards the fact that price changes affect distinctly various consumer categories; in other words, climate policies will determine higher costs for food for some households. It is vital for policymakers to understand and address the distributional effects of future policy action in the agriculture sector since it will be increasingly under the spotlight due to its polluting capacity.

2.2 Energy management

In order to address the issue of energy poverty, the proposal for a new *Energy Efficiency Directive* (EED) includes an obligation that EU nations adopt improved energy efficiency initiatives as a top priority among vulnerable consumers, those who are experiencing energy poverty, and, where applicable, those residing in social housing. Via the newly created *Social Climate Fund*, the EU Emissions Trading System (ETS) extension funds to buildings and transportation will be employed to offset any potential adverse distributional effect. Each EU nation will be required, under the energy savings duty (Article 8), to reach an energy savings share among vulnerable customers and citizens experiencing energy poverty based on standards that account for national circumstances (*Energy Efficiency Directive*, n.d.).

2.3 Production technologies

The third measure concerning industry standards that will be explored in this paragraph concerns production technologies, allowing countries to enhance low-carbon technologies' employment in their production process. According to Eurofound (2021), in Lithuania, replacing polluting industrial

technologies with less harmful ones through subsidies and investments in tangible assets like machinery and technology (Order No. D1-309 of May 26, 2020) is estimated to have a proportional impact.

Subsidies

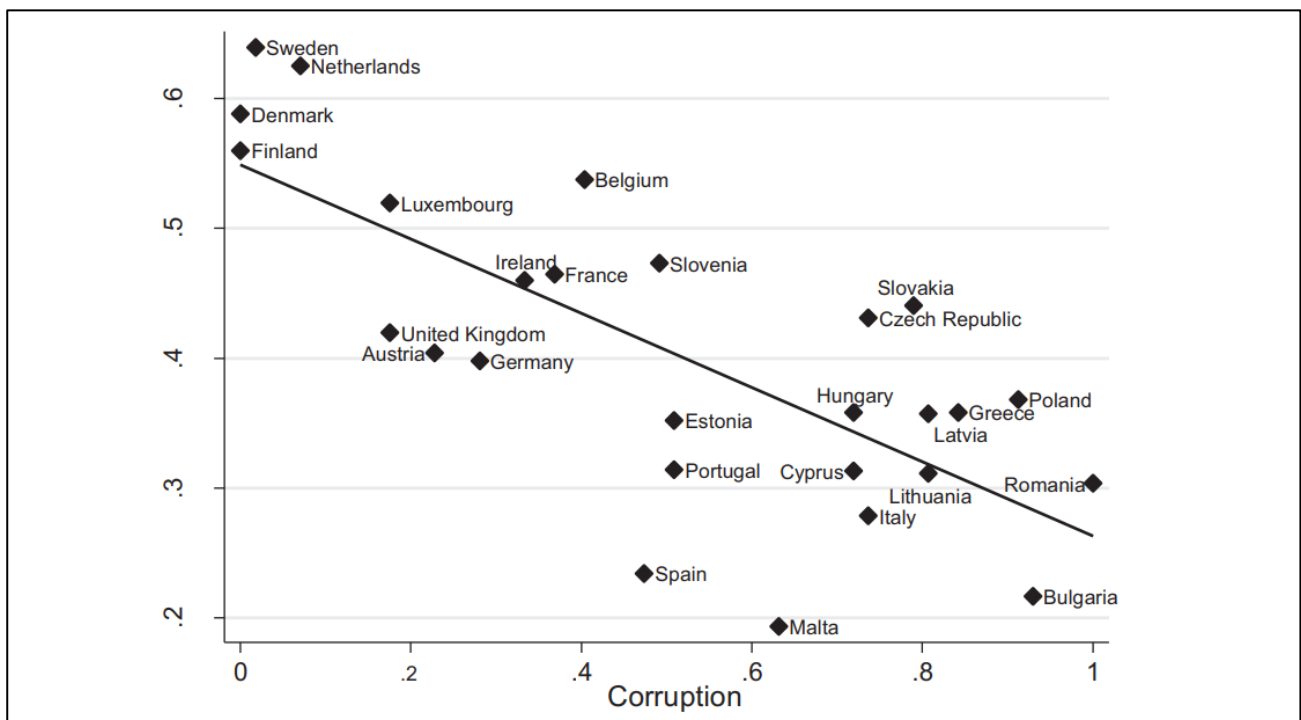
To pursue the ambitious climate objectives, in addition to the previously analysed taxes, government regulations and industry standards, policymakers have introduced subsidies for individual citizens and companies, namely incentives for investment in or consumption of low-carbon technologies and their final goods. These incentives can range from direct subsidies, including those related to research and development into carbon capture and storage, tax reductions, as those for buying electric cars, or para-fiscal instruments, such feed-in tariffs, as those for photovoltaic systems. These features generally make subsidies a regressive measure since the companies or households that invest for this newly developed low-carbon technologies are just those that own a high capital. Incentives for energy-efficient buildings, retrofitting and heating improvements are among the most common form of subsidy in the European Union. For instance, the Italian Ecobonus and Bonus Casa programmes provide tax benefits for building retrofits and the credits are based on the type of retrofitting technology employed; thus, they are regressive because they depend on the initial investment made. As a result, households with higher incomes gain more than those with lower incomes, which is why policymakers are working on modifications to minimise these negative implications. Another category of incentives is represented by subsidies with the purpose of promoting the consumption of sustainable energy. However, some Member States have often identified these measures as having adverse distributional effects. As proof, because of the requirement for prior investment in a photovoltaic system, which is unlikely to be accessible for lower-income homes, Austria's tax exemption on self-produced energy is generally regressive. Whereas, in France, the government pays the difference in the bill between market price and production price, showing public support for the employment of renewable energy that determines a progressive effect for-income households (Zachmann et al., 2018).

3. How corruption and economic inequality shape the perceived effectiveness of climate policies

After having provided examples of European policies having distributional implications, and before analysing possible methods for addressing these effects in the following chapter, a focus on the perceived effectiveness of climate policies shall be pointed out. Regardless of the possible regressive nature of these instruments, in the policymaking phase for the successful implementation of the policy, it is undoubtedly essential to account for either the previously discussed distributional effects

and the perceived effectiveness of these instruments by citizens (Harring, 2014). To assess the variation on the way these policies are generally perceived in EU country, two variables play a primary role, namely the degree of corruption and economic inequality.

Firstly, corruption generally causes a feeling of suspicion towards the entire political system, determining tendencies to free-ride and low compliance with public policies (Warren, 2004). Consequently, citizens living in nations with high levels of corruption tend to have less tax morale. According to Scholz and Lubell (1998), in this case, the most efficient method to achieve an optimal scenario if there is low compliance with an environmental policy, in other words, when citizens or companies cheat with subsidies or evade taxation, is through a more powerful regulation. Graph 1 below shows the correlation between the level of corruption and aggregated means of preferences for environmental policies in each EU country, through the regression line. As we approach societies with a high level of corruption, the likelihood of approving environmental policy measures decreases. Indeed, they are chosen as effective policies mainly in the Nordic and Benelux countries and less often in Southern and Eastern Europe. Furthermore, it is crucial to consider that implementing pro-environmental initiatives in already corrupt circumstances could ultimately result in an increase in corruption (Damania, 2002). Indeed, if there are inadequate expectations for the effectiveness of such programs, this outcome might even be intensified.

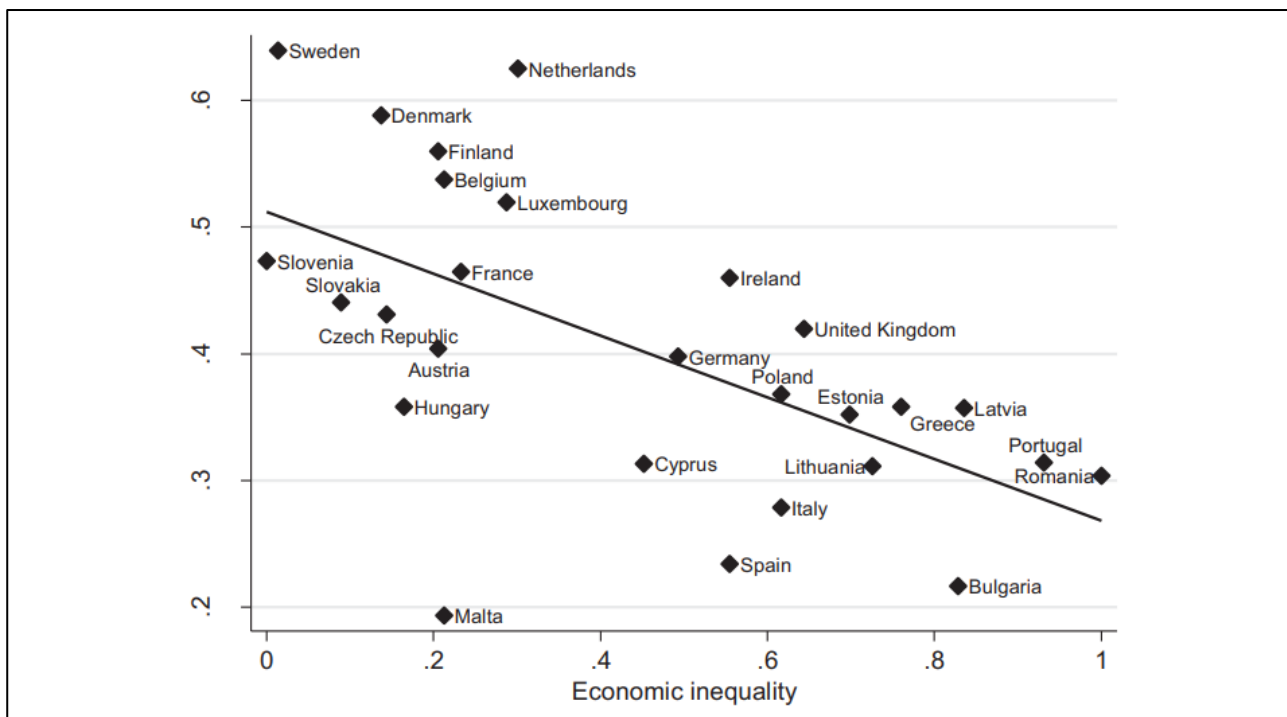


Graph 1 – Relation between perceived effectiveness of EU environmental policies and corruption

Source: "Eurobarometer 68.2: European Union Policy and Decision Making, Corruption, Civil Justice, E-Communications, Agriculture, and Environmental Protection".¹⁰

The second variable, linked with environmental policies and their previously analysed distributional effects, concerns the implications of economic inequality. For instance, citizens with lower incomes are disproportionately impacted by gasoline eco-taxes because fuel accounts for a higher portion of their household budgets and they are obliged to employ fuel-inefficient vehicles, making them perceive the regressive character of these policies. As shown in Graph 2 below, people are less likely to view EIs as an ineffective policy option in a country where the income distribution is slightly unequal since some societal segments—typically those with high incomes—are not as affected by the policy. However, restrictions do not have this distributional effect; punishment is meted out regardless of wealth (Harring, 2014).

Additionally, some studies demonstrated that the awareness of unfairness increases propensities for free-riding. When a policy has unjust distributional effects, people could believe that other actors will not respect it (Eek and Biel, 2003).



¹⁰ The information was gathered in November, December, and January 2008. There were approximately 1000 responses in each of the 27 EU Member States that were included in the survey, which includes a total of 26,730 participants.

Graph 2 – Relation between perceived effectiveness of EU environmental policies and economic inequality

Source: "Eurobarometer 68.2: European Union Policy and Decision Making, Corruption, Civil Justice, E-Communications, Agriculture, and Environmental Protection".

Through the analysis of the graphs, we can conclude that also within Europe when it comes to opinions and assessments of the possible effectiveness of various policy tools, there is a significant amount of cross-country heterogeneity. As demonstrated, EU citizens of some Member States, namely Nordic and Benelux nations, generally consider pro-environmental policy instruments as the most effective tool for enacting climate policies. This is a crucial finding since it could determine implications for both the application and the efficiency of such programs. Therefore, policymakers should bear in mind that these policy actions will likely fail in a context where public opinion rejects them (Jagers and Hammar, 2009).

The significance of equity issues in climate policy is connected to household income and spending habits variations. In order to reduce their use and incentivise consumers to switch to greener alternatives, policies to limit greenhouse gas emissions, such as carbon pricing or permit trading schemes, will increase the cost of carbon-intensive products. This has, in turn, raised social concerns that policies to mitigate climate change will disproportionately harm low-income households, which spend a larger percentage of their income on essentials like energy use for home heating (Vandyck et al., 2021). According to some studies, a possible approach to address the issue of regressivity is to formulate complementary policies to reduce or counteract the potential regressive impacts of carbon prices by employing additional revenue from carbon pricing. (Klenert et al., 2018). To give an example, if the revenues from CO₂ taxes are recycled through labour tax reductions or the increase in welfare transfers, such as unemployment compensation or pensions, they may result in different effects on various socioeconomic groups (Williams et al., 2015).

CHAPTER 3: Designing climate policies to address their collateral distributional effects

The analysis conducted until now is the basis for addressing the adverse collateral effects of environmental policies. The first chapter, devoted to the sociological and philosophical framework, is fundamental for contextualizing the European energy crisis scenario. While the second chapter, being focused on the characterizing features of the main policy measures with their respective distributional implications and their perceived effectiveness by citizens, will be the basis for the identification and presentation of initiatives at any administrative level to provide insights on the design of policy packages to both mitigate the distributional implications of the policies measures analyzed in the previous chapter and to gain more political acceptability. Although each EU nation has its own strategy for tackling poverty, the European Commission has given energy poverty more attention over the past ten years. Additionally, in recent years, EU energy efficiency, decarbonization, and sustainable energy transition programs have emphasized decreasing energy poverty. In the ongoing discussion of the green post-pandemic recovery, balancing the social and environmental goals of public policies has attracted considerable attention considering the expanding economic inequalities (Atkinson, 2003).

Nevertheless, it is still unresolved how to formulate a set of policies that will lead to a "just" low-carbon transition. As mentioned in the previous chapter, when regressive distributional impacts of climate policy enhance already-existing disparities, they are particularly "unjust" and challenging to accept. Moreover, according to recent studies (Colantone and Stanig, 2019), rising labour market inequality played a role in the rise of populism in Europe, which may potentially deteriorate domestic support for climate policy. Indeed, governments have been on the defensive as Europe's winter of discontent, one year after Ukraine's war outbreak, has grown worse. The energy crisis has enabled right-wing populist parties to varying degrees in several European nations. By portraying climate action as an elitist initiative at the expense of the working class, populists are portraying themselves as protectors of the vulnerable. Through the usual populist narrative, they have narrowed the dilemma to a simple choice between addressing social problems faced by citizens or focusing on climate change. For the expositional purpose, this chapter starts by reminding examples of past national initiatives, contributing to the implementation of future measures, to delineating examples of compensation policies. Then, it concludes with an analysis of the main factors influencing the implementation of these policies, namely their political acceptability (already mentioned in the previous chapter), behavioural economic factors and European governance.

1. Have previous national initiatives taught us something?

This section starts from the assumption that previously implemented policies offer valuable lessons for stakeholders for future policy projects because, as seen, sometimes, well-intended policies have unpleasant and possibly unforeseen consequences. A clear example is provided by the subsidies for the energy efficiency of buildings in Berlin, Germany, which is willing to achieve the 2050 goal of climate neutrality. Since buildings are responsible for almost 50% of Berlin's CO₂ emissions, their efficiency needs improvements. The city has a booming real estate market, and many development firms tend to renovate buildings and structures through federal subsidies. Nevertheless, some tenant organizations are worried about a consequent increase in the price of rent, making it prohibitively expensive for many citizens. Consequentially, Berlin Urban Planning Department has developed the so-called Climate Justice Maps, namely graphs that offer statistics and details on social issues rather than just air pollution, the intensity of noise and green spaces' extension. In light of both aspects, policymakers recognized that more balance between the two policy goals of climate preservation and social welfare was needed. In response, the local government increased national subsidies for buildings and their energy utilities renovations, albeit rents' prices would stay the same. Additionally, it was decided to impose a rent cap on apartments without any existing restrictions, which was then challenged in court by the German Constitutional Court. Thus, the case has national significance and raises the question of balancing social and ecological considerations in urban and national planning (Eurofound, 2021).

2. Compensation policies

Previous discussions bring us directly to the critical question: how to formulate compensation policies in order to mitigate the trade-offs in the adoption of the EU's ambitious policy actions? Thus, the main point of this section is to address the issue through the comparison of four strategies, that is, lump-sum redistribution, broader tax reforms, Green Deal, and lastly, progressive subsidies for purchasing green products.

2.1 lump-sum redistribution

The most straightforward approach to counteract distributional effects is to redistribute tax income as lump-sum payments¹¹ to all citizens. According to previous literature, lump-sum rebates are well-known for changing the direction of a carbon (or energy) tax's effect from regressive to progressive (Williams et al., 2015). However, the consequence is the rebound effect; in other words, this

¹¹ A one-off payment, fixed sums to each household

redistribution hinders efforts to cut GHG emissions because individuals spend some of the money they get in rebates on products with a high carbon footprint (e.g. gasoline), slightly increasing emissions. Similar justifications can be made for proposals to increase revenue by indexing social contributions (Fullerton et al., 2012): progressive short-term effects are achieved without offering additional incentives to lower emissions and shift the economy's structure toward greener productions. With that being said, even though a limited degree of redistribution can be reached in the short-term and this has the positive effects of increasing political acceptability, it can be considered the less ambitious strategy to undertake either from an environmental or economic point of view.

2.2 Environmental tax reforms (ETRs)

Environmental Tax Reforms can be defined as reforms of the taxation system aimed at raising the tax burden on environmentally polluting activities. They were initially designed with the purpose of tackling 1990s unemployment rates (Carraro and Siniscalco, 1996). Since labour tax rates were considered to be an obstacle to job expansion, ETRs represented a revenue-neutral solution to address these already-existing tax system distortions. According to theory, if there are distortionary taxes in place and markets are unreliable, eliminating them would have positive effects on the environment, the generation of jobs, and the disparity between insiders and outsiders in the labour market (Bovenberg, 1999).

2.3 Green Deal Plan

The EU Green Deal has been the European response to the crisis brought about by the COVID-19 pandemic through a set of investments in the field of the green economy while guaranteeing that no one is left behind (European Commission, 2020). It consists of an investment plan mobilizing EUR 1 trillion between 2020 and 2030. To ensure that workers are not negatively affected, jointly with the EU Green Deal, the Just Transition Mechanism, including the Just Transition Fund, addresses EUR 150 billion between 2021 and 2027 (Eurofound, 2021). However, two distinct patterns come into contrast in terms of distributional consequences. On the one hand, investments in environmentally friendly infrastructures raise the relative demand for manual labour, mitigating the possibility that these people in polluting companies will lose their jobs. On the other hand, regions where "green skills" were more prevalent were also wealthy, high-tech, and were already on a more robust growth trajectory. This suggests that in order for everyone to benefit from these expenditures, a green deal plan may worsen regional disparities and necessitate significant worker migration. Indeed, according to Bontadini and Vona (2020), EU-rich countries have a remarkable comparative advantage in green technologies, and consequently, they will benefit disproportionately from the EU Green Deal. Hence,

this plan may cause an exacerbation of the already-existing gap between wealthy and green communities living in urban areas and poor communities living in rural areas, weakening environmental policies' political acceptability, further explored in the section to follow. Furthermore, green investments in infrastructures, such as speed rains or electric vehicles, can be regressive since high-income households are still the primary potential consumers, and the effectiveness of public spending plans as infrastructures' investments strictly depends on the government quality, especially corruption, already analyzed in the final section of the previous chapter (OECD, 2021).

2.4 progressive subsidies for purchasing green products

As aforementioned, the European Green Deal plan acknowledges the issue of struggling poor communities by creating a special Just Transition Fund to assist coal-dependent areas that would suffer from a significant and sudden decarbonization. Generally, regions whose economies depend on polluting sectors will shoulder many of the costs of policy in terms of lost jobs and revenue, and they will also experience a more pronounced trade-off between fairness, economic efficiency, and environmental effectiveness. These characteristics require particular policy intervention.

As Vona and Patriarca (2011) claim, with non-homothetic preferences (namely, only after the satisfaction of basic needs, good green consumption begins), tackling inequalities permits the development of a positive self-reinforcing relation between technological advancement and the introduction of green goods. However, this situation can happen just in rich countries for the larger quantity of potential green consumers. Additionally, in Zhou and Li's (2018) model of electric vehicle adoption, subsidizing their purchase could become a strategy for solving the charging stations' critical mass constraint through the encouragement of investments.

Another strategy is designing policies that stimulate (or "nudge") specific behavioural responses. According to Gillingham and Bollinger (2020), the Solarize program is a large-scale behavioural intervention designed to boost the uptake of home photovoltaic (PV) systems through informational campaigns led by volunteer ambassadors. The approach, according to the authors, was very successful in raising PV installation and lowering the prices of installation in affluent neighbourhoods. Alcott (2011) discovers that a peer comparison-based information campaign has significant effects on energy savings, although the effect is focused on homes using more energy.

Thus, it is a feasible but insufficiently undertaken route for boosting policy efficacy to combine progressive subsidies for green technologies with climate taxation and soft policies, such as nudges and communication campaigns. For instance, even in the case of an energy tax, well-designed information campaigns aimed at inattentive users may dramatically close the energy-efficiency gap, even while subsidies to energy efficiency programs rarely approach the efficient level of usage.

Moreover, combining financial aid with community-based education initiatives such as Solarize might boost the uptake of specific eco-friendly technology in vulnerable areas (OECD, 2021).

3. Political acceptability of climate policies

As demonstrated until now, research has paid close attention to fairness issues since many environmental policies, especially climate policy, have severe distributional consequences. Fairness is valued by academics as being crucial to people's support for burden sharing and international climate agreements (Gampfer, 2014). There needs to be more than scientific evidence to drive green policies' implementation. Indeed, often the lack of political awareness in the process of designing these policies constitutes an obstacle that often leads to inaction towards climate change or to the implementation of policies with distributive challenges. In this sense, this section will explore the importance of the political acceptability of green policy packages and related issues. One of the main reasons to analyze distributional effects is that the green policy packages suggested in the previous paragraphs do not all have the same political acceptability. The starting premise is that while distributional effects influence political preferences and, ultimately, political acceptability, other factors, namely ideology, identity, biases, and faith in governments, are also significant. Brushing up the first chapter's example of the Yellow Vests in France, in this case, compensatory provisions addressed to low-income households were not provided when carbon taxation increased. However, in Douenne and Fabre (2020)'s opinion survey, it is shown that there is a significant perception bias of the costs and benefits concerning the entire plan, a gross overestimation of the actual costs and a widespread feeling of inequity towards a government that had recently lowered wealth taxes. In other words, this example demonstrates how challenging it is to measure the relative incidence of the feedback from distributional impacts to political acceptability and empirically isolate them from other causes. Citizens might express their discontent with the overall unfairness of other governmental policies by opposing environmental policies. Furthermore, there are two primary areas where communication needs to be targeted if carbon and environmental taxes have any chance of gaining acceptance. Firstly, citizens must be fully aware of the inefficiencies in current energy policies, such as fossil fuel subsidies, which are much more regressive than a carbon tax or an auctioned emission trading plan. Secondly, when effectively monetized, positive health effects outweigh possible financial losses, although they are rarely brought up in the public discussion of environmental legislation (OECD, 2021).

4. How to address energy poverty through the lens of a behavioural economics perspective

This section aims at providing an overview of energy justice from a behavioural-economic viewpoint to shed light on some of the issues and develop potential solutions. Thus, a link with the first chapter must be made: distributive justice, along with fiscal measures, can offer the design of a policy package. This calls for assessing how social goods, such as energy, and harms, such as policy costs in both social and economic spheres, are spread throughout society, as well as how these distributions distance themselves from appropriate and just ones, including those reflecting the need principles. For instance, when taking into account that a specific set of essential energy services constitutes a vital requirement to guarantee a clean and secure environment for everyone to live in, energy poverty is consequently considered a violation of a basic universal right, such as physical security (Sovacool et al., 2016). Although policymakers are essential when it comes to the development of a just energy transition, all parties involved—most notably, citizens—play a key role in the process of operationalization (DellaValle & Haarstad, 2020). Firstly, the preferences of citizens about the costs and benefits of a certain policy package are heterogeneous: therefore, it is more likely to find support from the general public if the policy proposed takes sufficiently and accurately into account the feature of variability, it is hardly applicable and determines the acceptability problem analyzed below (Konow, 2000). Secondly, a lack of recognition and procedural fairness sets a foundation for the unequal distribution of energy services throughout society (Walker & Day, 2012). If differentiated energy demands are not sufficiently considered when designing policies (Eisfeld & Seebauer, 2022), transfers may be misallocated, and energy poverty may continue (targeting problem). Nonetheless, in the case of disadvantaged actors are considered passive beneficiaries of interventions, the policymaking process will barely take into account and fulfil their needs for energy, determining the responsibility problem (Della Valle & Czako, 2022).

Hence, since collective action by involved actors can effectively address extensive social challenges, the capacity to act can be improved by considering citizens' socioeconomic backgrounds and heterogeneous factors. In the following sections, it will be illustrated how the information provided by the study of behavioural economic factors may contribute to the formulation of specific interventions.

4.1 Targeting problem

One of the main features of a green policy package that is aimed at both tackling climate change and energy poverty, such as carbon pricing, shall be to reach the target group, for instance, the energy poor. It is essential to avoid the risk of neglecting to effectively address the issue due to inaccurate

identification and distribution of the target groups. Nevertheless, policymakers often face challenges in completely identifying the several features that underlie energy poverty (Thomson et al., 2017). In this regard, technological advancements, as smart meters¹², offer great potential for overcoming these informational hurdles. Indeed, they allow revealing hidden demands on energy, such as those of those who are compelled to limit their energy consumption in order first to afford other essential goods (Faiella & Lavecchia, 2021).

4.2 Acceptability problem

A fair policy package identified by policymakers, such as carbon pricing in addition to a financial tool targeted at the energy poor, is not inevitably likely to gain the general public's support. Some researchers in experimental economics demonstrate that people are concerned not just with the outcomes (such as benefits and costs) but also with how these are allocated (Fehr & Schmidt, 2001). In other words, if people think a particular use of carbon tax proceeds is unfair, it might not be supported by public opinion (Povitkina et al., 2021). Nonetheless, these perceptions are frequently subject to bias and have an impact on society's costs. In this concern, a climate package can be enhanced with a tool that takes into account empirical data on human behaviour, such as a nudge that implements a change in the framing of the policy communication to allow people to assess the fairness of a specific policy package in a less biased way (Carlsson et al., 2021). For instance, by using the evidence that exposing citizens to various forms of information on the causes of inequality is an effective way to lessen polarization in self-serving notions of justice, policymakers might increase public support (Amasino et al., 2021).

4.3 Responsibility problem

The transition to a more equitable and inclusive energy system is “*about more than just technological and political change, (...) it also involves significant social and behavioural transformations that challenge conventional assumptions about democracy and economics as well as historical narratives*” (Lennon et al., 2019: p. 2). New social roles and obligations emerge in accordance with such profound advancements. In the discussion on how to operationalize energy justice in the energy system, the role of the energy citizen is receiving growing attention. This position is connected to an active, participative approach that transcends passive acceptance and takes the shape of active engagement in the relevant energy decision-making processes, including embracing responsibility for energy production and consumption (Wahlund & Palm, 2022). Hence, when considering the energy poor, it is essential to advocate for this role of the energy citizen: firstly, since citizens may consume

¹² A smart meter is an electronic device that tracks data such as electricity usage, voltage, current and power factors. It transmits data to electricity suppliers for system monitoring and customer billing as well as to consumers for a better understanding of use patterns.

more energy services after financial measures to lower costs or begin exploiting previously unaffordable energy utilities strictly linked to emissions (Brockway et al., 2021). Consequently, individuals could be pushed to assume accountability for the consumption of energy utilities through a behavioural tool, for instance, a nudge aimed at informing them of their energy consumption's implications. These nudges, whose effectiveness in changing environmental behaviour change has been proven, may make it possible for people to use energy more responsibly (Asensio & Delmas, 2015). Secondly, if the purpose of the energy transition is to reach also fairness and equity, the so-called energy poor, the direct victim of injustices, should be given the opportunity to assert their claims on how to attain these objectives (Della Valle & Czako, 2022). As a result, through behavioural insights, policymakers might enable individuals to evolve from being just passive policy beneficiaries to aware and competent thinkers. Thus, including citizens in the policymaking process thanks to thinks and nudges plus appears to be a valid method to accomplish this (John & Stoker, 2019). To give a broad conceptualization of both tools, we can define thinks as deliberative interventions where citizens participate by reflecting on a specific issue and offering precious suggestions for potential remedies, whereas nudges plus are the result of a co-design process that incorporates the experience of local policymakers and citizens. Thus, these interventions may represent vulnerable citizens' energy needs more efficiently since they have been shown to foster individual agency while protecting people from the cognitive strain of deliberation. The Energy Poverty Advisory Hub, energy cooperatives and intermediaries constitute an example of a program aimed at helping and simplifying this process between local, regional and national authorities within the European Union (Grossman et al., 2021). For instance, the leading Italian trade unions and ENI ("State Hydrocarbons Authority"), one of the largest oil and gas multinationals worldwide, concluded an agreement in December 2020, named "Insieme" ("*Together*") to endorse the company's decarbonization agenda and enhance its involvement in greener alternatives. Moreover, it envisions joint governance that also includes the design of new bilateral bodies and the establishment of principles, such as well-being at work or skills development (Dobson, 2020).

5. Governance on the EU Energy Strategy

This section discusses the foundation for energy justice in the European Union and the challenges faced in addressing energy poverty. The foundation for energy justice has been set by the EU's current Energy Strategy. Since the beginning of 2010, initiatives have been undertaken to firmly establish the protection of vulnerable customers. However, they can be considered to have been ineffective, and the reasons for this failure can be traced back to the Green Deal's influence on EU policymaking. This significantly relies on the Commission's expertise and regulatory emphasis, whilst the Member States alone are responsible for social policy. According to a comparison study done by Kyprianou et al.

(2019), regional measures to reduce energy poverty are more successful than those at the national level.

Additionally, Kyprianou et al. argue that despite the EU's desire for a pan-European and consistent framework, the EU Directives that discuss energy poverty and offer recommendations to the Member States do not specifically refer to vulnerable consumers but rather consumers at risk of energy poverty in general. This represents a severe defect because this ambiguity is later translated into national law, creating "misguided measures". Energy policy in nations with high levels of energy poverty aims to liberalize and privatize the industry, which causes an increase in energy prices to outpace family income growth. This increases the burden on low-income households who become locked in energy poverty, along with outdated structures (Primc & Slabe-Erker, 2020). Nevertheless, the study discovered that the absence of energy poverty can be attributed, on the one hand, to high household incomes combined with energy poverty, as in the case of the Netherlands, or, on the other hand, high household income and non-high energy prices, which have nothing to do with social policies and instead have to do with building efficiency, as happens in Belgium. This is in some ways contradictory to Kyprianou et al., which can be explained by the snapshots they used in their comparative analysis of Cyprus, Spain, Portugal, Bulgaria, and Lithuania, which are among the nations with the highest levels of energy poverty predicted for 2020 based on Statista's ability to keep warm indicator (Share of Households Unable to Keep Their Home Adequately Warm in the EU in 2020, by Country, 2020). In light of this, Primc and Slabe-Erker's (2020) end up claiming that different policy responses will be needed depending on the severity of poverty and its underlying causes in different Member States.

This factor supports the governance-related critique of the existing EU Energy Strategy. The EU relies on a market-based and consumer-centred approach to address energy poverty, which on the one hand, almost satisfactorily accounts for energy justice, but, on the other hand, frequently endangers consumers by compromising other tenets of the EU Energy Strategy. However, according to Bouzarovski (2018), the Commission's energy market competencies continue to be centred on developing an integrated market, making its policies one-sided by legislating on the internal market and giving the Member States more autonomy for social policy solutions. Furthermore, according to Bouzarovski, who cites the 2007 Citizens' Energy Forum (which was intended to implement and enforce consumer rights by bringing together consumers as stakeholders, national regulators, and governments), there has been an attempt to reconcile this to some extent through the use of soft-law in energy governance by the EU. This will lead to the formation of the Vulnerable Consumers Working Group (hereafter, VCWG), held responsible for improving understanding of energy poverty, the causes of vulnerability, and the tools for addressing them. The application of soft legislation to

address intra-state disparities in energy access clearly embodies elements of energy justice. However, these tools are sometimes ineffectual since Member States have frequently only consented to take part voluntarily, which may distort the data and information about distributive justice that is accessible. There is an obvious effort at a bottom-up strategy, but it may be ineffectual given the "soft" character of such organizations and their final role in policymaking, diminishing the significance of procedural fairness in the process. Additionally, the inter-state disparities resulting from the energy prism within the EU present further obstacles to the development of a unified, solidaristic Energy Union. The pragmatic environment between countries positioned in Northwest Europe and those in the Southeast differs, as evidenced by the policy objectives in connection to energy in these nations. Additionally, the lack of a comprehensive framework to date has resulted in more disparate energy policies across all of Europe, which widens the gaps in inequality in the Union.

Due to the Member States' reluctance to cede their sovereignty, the Commission's plans, including the deployment of renewable energy sources, cannot include any further intrusive measures. This is evident because the aforementioned differences in political, social, and economic behavioural patterns would necessitate sacrifices that few nations are ready to make. Many of the challenges addressed in CEP¹³ and the Green Deal have been ground-breaking so far that they have fundamentally altered the EU Energy Strategy in order to accommodate a world that is transitioning to net-zero carbon emissions. It is impossible to offer a coherent and flexible framework based on justice principles to address energy issues in the region because these only make an effort to address the questions of intra-state inequalities in energy systems. In the end, these shortcomings result in the energy trilemma, causing a growing gap between the EU's energy-related objectives (Bouzarovski, 2018).

¹³ The Certificate of Suitability (or CEP) is issued by the European Directorate for the Quality of Medicines (EDQM). It attests to a pharmaceutical substance's or active pharmaceutical ingredient's (API) compliance with the required guidelines of the EU directives for medicines.

CONCLUSION

As climate change mitigation policies become more comprehensive, extensive, and ambitious to achieve the Paris Agreement's targets, awareness and consideration of "justice" and "equality" in managing the transition to a low-carbon economy are likely to become more important (Michaelowa et al., 2018).

The research in this study demonstrated the importance of location, content, and method in identifying and managing the possible inequality effects of climate change mitigation programs. The potential for social and economic gains that can alleviate poverty and present chances to address gender, health, and economic inequities exists with effectively planned and executed climate change mitigation programs. The co-effects of reducing global warming, however, will not all be good or spread uniformly. Unless steps are done to guarantee equal access and actively reduce unfair results, certain individuals are likely to lose out. Poor and marginalized population sub-groups are particularly vulnerable to the negative effects of poorly designed or inadequately implemented climate change mitigation policies because they are highly exposed to the negative effects of climate change (and are thus among the greatest beneficiaries of successful efforts to limit global warming to 1.5–2°C).

Nevertheless, this discussion has not had significantly influence on current social policy discussions: this need to change since social policy will immediately be impacted by climate policy through a number of paths, including redistribution implications. These outcomes are crucial for two reasons. They first express concerns about justice. For instance, what role does family income play in the costs associated with climate change mitigation legislation on citizens? Are these responsibilities commensurate with the effects that various lifestyles have on the environment? And how can measures to combat climate change be developed to prevent unfair distributional effects? Second, as demonstrated in chapters two and three, the probability that governments implement such measures will depend on the degree of popularity welcomed by the majority of the population. There has not been much empirical research in this area, but it appears likely that the (seen) fairness of such policies will be crucial for public acceptance.

Moreover, most of the climate mitigation strategies evaluated will not simultaneously reduce greenhouse gas emissions while preventing any possible adverse distributional effects on the economic, social, and health-environmental facets of life. This is due to the fact that these policies typically lead to increased energy prices, which put a greater strain on lower income groups than higher ones. In real terms, lower-income households devote a larger proportion of their disposable income to energy costs. For this reason, households should be adequately compensated for any economic, social, or health losses in conjunction with the adoption of climate mitigation initiatives.

Hence, a multidisciplinary strategy encompassing the economic, social, and health sectors is necessary for this to occur. A well-balanced policy mix that incorporates social issues and environmental goals is essential for ensuring that environmental objectives are attained, and regressive distributional effects are minimized. Furthermore, to guarantee that the effects of climate mitigation initiatives are properly paid for, constant communication between EU/national and local/regional levels of government is necessary. National or even international scales are often used to enact climate mitigation strategies. Instead, it is better to develop and execute compensation rules locally and regionally.

Although the primary goal of climate mitigation policies is to lessen adverse climatic effects, to address current regressive concerns, strengthen existing connections between the environmental and social policy areas seems to be another useful tool for institutions and policymakers. It is possible that these policies cannot be created to limit regressive impacts *ex ante* without compromising their ability to protect the environment and their economic viability. For this reason, it is essential to supplement a climate mitigation policy with extra measures that target and remove distortionary effects introduced by the climate policy in the design stage, when the immediate regressive affects are discovered. Existing suitable social programs should address the regressive impacts through a constant communication between policymakers in the environmental, social and economic sectors.

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SUMMARY IN ITALIAN

Secondo le proiezioni del Climate Vulnerability Forum, i cambiamenti climatici causano ogni anno 400.000 morti per fame e malattie, ed entro il 2030 questo numero potrebbe salire a 700.000 morti all'anno. La maggior parte della crescita demografica si è verificata nei Paesi non appartenenti all'OCSE; tuttavia, i paesi OCSE continuano a guidare l'economia globale. La maggior parte dell'attività economica e la quota di consumo sono ancora concentrate nei Paesi OCSE, anche se storicamente la maggior parte della produzione globale è stata localizzata nei Paesi OCSE. Nel 2010, infatti, i Paesi OCSE rappresentavano solo il 18% della popolazione mondiale, ma producevano il 74% del reddito mondiale. Questi dati dimostrano l'enorme portata della disuguaglianza globale, della discrepanza tra i responsabili del problema e coloro che sono più a rischio per i suoi effetti distruttivi, rendendo il cambiamento climatico una questione globale di giustizia sociale e di uguaglianza.

Proprio a causa della complessità del problema, il cambiamento climatico è stato definito da Gardiner (2006) come una "tempesta morale perfetta". Si tratta infatti di una questione globale, che invoca considerazioni etiche, che implicano un certo grado di responsabilità morale. Infatti, se non crediamo che le nostre azioni siano sempre soggette a una valutazione morale e che anche ciò che è al di fuori della nostra sfera di influenza abbia valore, è difficile concepire il cambiamento climatico come un problema e sviluppare possibili soluzioni attraverso le politiche. Le caratteristiche specifiche del cambiamento climatico causano ostacoli sostanziali alla nostra capacità di affrontare le questioni con politiche appropriate. Anche se le complesse questioni etiche potessero essere risolte, agire potrebbe essere difficile, poiché siamo incredibilmente suscettibili alla corruzione morale a causa della "tempesta".

Secondo le stime della Banca Mondiale contenute nel più recente rapporto globale dell'Intergovernmental Panel on Climate Change (IPCC, 2014), le nazioni povere colpite avranno bisogno di 100 miliardi di dollari all'anno per affrontare le conseguenze del cambiamento climatico. Tuttavia, a causa delle critiche mosse dalle economie industrializzate, che hanno affermato che il raddoppio degli aiuti esteri non è realistico nell'attuale contesto economico, questa statistica è stata rimossa dalla breve sintesi consegnata a tutti i leader globali. Di conseguenza, l'omissione di questo rapporto dell'IPCC ha avuto un impatto negativo sulle nazioni povere e costituisce un esempio di come l'ingiustizia ambientale venga esacerbata attraverso il processo di *slow violence*. L'idea di violenza lenta è stata introdotta da Nixon (2011). La violenza lenta espande la definizione di violenza ed è definita come "*una violenza che si verifica gradualmente e non si vede, una violenza di distruzione ritardata che si disperde nel tempo e nello spazio, una violenza attuale che di solito non viene vista come violenza*". La violenza è generalmente considerata come un incidente o un'azione

improvvisa, esplosiva e drammatica che esplode in una visibilità immediata e sensazionale. Al contrario, il cambiamento climatico è visto come una forma di violenza lenta, perché i suoi effetti non sono immediatamente percepibili.

Poiché sono necessarie ulteriori azioni per evitare e mitigare le conseguenze dei cambiamenti climatici, la questione, insieme al passaggio a un'economia neutrale dal punto di vista energetico, è particolarmente delicata nell'agenda politica dell'Unione europea. Fin dall'inizio del progetto europeo, la questione energetica è sempre stata strettamente legata alla storia europea, diventando un simbolo di unità dell'Unione. I vantaggi della collaborazione sul carbone dopo la Seconda Guerra Mondiale hanno sconfitto i sentimenti nazionalisti e hanno portato alla formazione della Comunità Europea del Carbone e dell'Acciaio, un'unione che si sarebbe poi sviluppata nell'Unione Europea. Oggi, la capacità dell'Europa, intrinseca alla sua storia, di cooperare ancora una volta strettamente sulle questioni energetiche avrà un impatto sulla velocità con cui riuscirà a eliminare gradualmente il carbone e gli altri combustibili fossili. Tuttavia, l'Europa sta vivendo una tempesta perfetta. Le vulnerabilità strutturali del mercato energetico europeo sono state messe in luce fin dall'inizio del conflitto in Ucraina, ma sono presenti nel quadro energetico dell'UE da diversi decenni. Prezzo dell'energia, sicurezza energetica e sostenibilità sono i tre assi fondamentali del trilemma energetico. Negli ultimi 20 anni, la sicurezza delle forniture energetiche, in particolare di gas, al prezzo più basso possibile è stata al centro della strategia energetica europea. La guerra e le minacce che essa rappresenta per l'approvvigionamento mondiale di gas e petrolio servono a ricordare ancora una volta l'importanza dei combustibili fossili nell'attuale equilibrio energetico e a mettere in luce i limiti della lentezza della transizione verso le fonti di energia rinnovabili. La decisione di eliminare gradualmente il gas russo dal mix energetico dell'UE e il divieto parziale del petrolio russo, che rappresentava circa il 29% di tutte le importazioni europee di petrolio, hanno un impatto significativo a breve e medio termine sulle imprese e sulle famiglie.

Secondo le stime attuali, in Europa il numero di persone che vivono in condizioni di povertà energetica è aumentato drammaticamente da 34 milioni prima della crisi energetica agli attuali 80 milioni. I salari reali nell'Eurozona stanno diminuendo drasticamente, rendendo gli europei della classe operaia più poveri del 3% e, secondo Eurostat, nella sezione energetica dell'inflazione, c'è stato un aumento del 50% in Europa negli ultimi due anni. Pertanto, la povertà energetica è oggetto di crescente attenzione politica da parte dell'Unione Europea, in quanto costituisce un presupposto essenziale per realizzare una transizione giusta e sostenibile. Di conseguenza, la Commissione europea ha istituito l'Energy Poverty Advisory Hub (EPAH) per risolvere l'insicurezza energetica e accelerare la giusta transizione energetica dei governi locali europei. Le richieste di affrontare la

povertà energetica espresse dai movimenti di base e dalla società civile hanno mostrato chiaramente le implicazioni distributive dei prezzi dell'energia e i passi successivi necessari. Infatti, come nel caso di altre categorie di politiche, le policy climatiche possono portare a conseguenze socio-economiche negative. Ad esempio, secondo diversi studi, la carbon tax tende a causare effetti distributivi regressivi, peggiorando le condizioni delle famiglie a basso reddito rispetto a quelle ad alto reddito ed esacerbando le disparità esistenti (Eurofound, 2021). Questa influenza negativa sulla qualità della vita dei gruppi più vulnerabili potrebbe tradursi in un'opposizione politica al progetto climatico e in un calo del sostegno pubblico all'azione sulle politiche climatiche. Pertanto, è essenziale considerare come la politica climatica influisca sulla distribuzione e se gli sforzi di decarbonizzazione aggressivi si traducono in un chiaro aumento delle disparità, i responsabili politici non dovrebbero accettarli.

Il movimento francese dei "gilet gialli" rappresenta un esempio recente e notevole di malcontento pubblico legato alla questione del cambiamento climatico. L'obiettivo era quello di organizzare proteste su larga scala contro l'onere diseguale delle riforme fiscali, tra cui la carbon tax, attuate dal governo francese, su una porzione specifica della popolazione, ovvero la classe operaia e media e la maggior parte dei cittadini delle aree rurali e periurbane del Paese. Questo caso evidenzia l'importanza per i responsabili politici di tenere conto degli effetti distributivi delle politiche climatiche sui diversi gruppi socio-economici o, eventualmente, di sviluppare strategie per affrontare le conseguenze indesiderate. I ministeri o i dipartimenti dell'ambiente dei paesi membri sono responsabili dell'attuazione di queste politiche climatiche. Alcuni Paesi dell'UE (ad esempio l'Estonia o la Finlandia) hanno riconosciuto la questione come una priorità assoluta nell'agenda, ma spesso a causa di impedimenti come l'insufficienza dei finanziamenti e la mancanza di tecniche di valutazione, non si interviene. Di seguito, verranno delineate le seguenti misure politiche e le rispettive implicazioni distributive: carbon pricing, investimenti pubblici e regolamenti governativi, sussidi e standard industriali.

Come sostengono molti economisti, la carbon pricing è la soluzione più efficace per ridurre le emissioni, incoraggiando consumatori e produttori a adattare i loro comportamenti per raggiungere questo ambizioso obiettivo. In generale, a seconda del grado di paniere dei consumi e della variazione delle propensioni marginali delle famiglie tra i vari livelli di reddito, questo strumento ha conseguenze distributive dirette. Poiché i gruppi a basso reddito spendono in genere una percentuale maggiore del loro reddito disponibile in prodotti ad alta intensità di carbonio, saranno di conseguenza colpiti in modo sproporzionato da una carbon tax regressiva. Inoltre, l'impronta di carbonio dei gruppi ad alto reddito è spesso superiore a quella delle famiglie a basso reddito pro capite.

Per raggiungere l'ambizioso obiettivo di una giusta transizione verso la neutralità delle emissioni di carbonio, gli Stati membri dell'UE hanno anche introdotto diverse misure di regolamentazione attraverso atti normativi o l'introduzione di standard nel processo produttivo delle imprese. Per quanto riguarda le misure di efficienza energetica e il crescente utilizzo delle energie rinnovabili, in Francia i certificati di risparmio energetico per gli edifici hanno effetti progressivi in quanto aiuteranno, almeno in parte, le famiglie a basso reddito; si stima che l'aumento dei prezzi delle abitazioni sarà contrastato dalla regolazione dei costi energetici. Inoltre, l'eliminazione dell'obbligo di licenza edilizia per i pannelli solari ha dimostrato di avere un impatto progressivo sul settore energetico svedese.

Inoltre, gli standard sono regolamenti o leggi che limitano o vietano i prodotti con caratteristiche specifiche, come quelli con un consumo energetico o emissioni eccessive. Due esempi di categorie che caratterizzano questo tipo di misure sono gli standard settoriali e la gestione dell'energia. Le misure di questa categoria riguardano principalmente il settore agricolo, che è il secondo emettitore di gas serra dopo il settore energetico. Pur avendo un reddito disponibile equivalente complessivo superiore di oltre il 150%, le famiglie con i redditi più alti spendono solo il 19% in più per l'alimentazione rispetto a quelle con i redditi più bassi. Pertanto, le famiglie a basso reddito possono essere maggiormente colpite dall'aumento dei prezzi dei prodotti alimentari causato dalle politiche climatiche rispetto alle famiglie a reddito più elevato. Tuttavia, le preferenze alimentari cambiano; pertanto, le politiche climatiche avranno un impatto diverso sul costo di diversi beni agricoli. Con il controllo delle emissioni di questo settore, i prodotti alimentari ad alta intensità di carbonio diventeranno probabilmente più costosi in modo sproporzionato. Inoltre, per affrontare il problema della povertà energetica, la proposta di una nuova direttiva sull'efficienza energetica (EED) prevede l'obbligo per i Paesi dell'UE di adottare iniziative di miglioramento dell'efficienza energetica come priorità assoluta tra i consumatori vulnerabili, coloro che vivono in condizioni di povertà energetica e, se del caso, coloro che risiedono in alloggi sociali. Attraverso il Fondo sociale per il clima di recente creazione, i fondi del sistema di scambio delle quote di emissione (ETS) dell'UE destinati agli edifici e ai trasporti saranno utilizzati per compensare ogni potenziale effetto distributivo negativo.

Infine, per perseguire gli ambiziosi obiettivi climatici, oltre alle tasse, ai regolamenti governativi e agli standard industriali precedentemente analizzati, i responsabili politici hanno introdotto sussidi per i singoli cittadini e le aziende, ovvero incentivi per gli investimenti o il consumo di tecnologie a basse emissioni di carbonio e dei relativi beni finali. Questi incentivi possono andare dai sussidi diretti, compresi quelli relativi alla ricerca e allo sviluppo della cattura e dello stoccaggio del carbonio, agli sgravi fiscali, come quelli per l'acquisto di auto elettriche, o a strumenti parafiscali, come le tariffe

di alimentazione, come quelle per gli impianti fotovoltaici. Queste caratteristiche rendono generalmente i sussidi una misura regressiva, poiché le imprese o le famiglie che investono in queste nuove tecnologie a basse emissioni di carbonio sono solo quelle che possiedono un capitale elevato. Gli incentivi per l'efficienza energetica degli edifici, l'ammodernamento e il miglioramento del riscaldamento sono tra le forme di sovvenzione più comuni nell'Unione Europea.

Un possibile approccio per affrontare il problema della regressività consiste nel formulare politiche complementari per ridurre o contrastare i potenziali impatti regressivi dei prezzi del carbonio, utilizzando le entrate aggiuntive derivanti dalla tariffazione del carbonio. Tuttavia, è ancora irrisolto il problema di come formulare un insieme di policy (ad esempio, la redistribuzione forfettaria, le riforme fiscali più ampie, il Green Deal e, infine, i sussidi progressivi per l'acquisto di prodotti verdi) che portino a una transizione "giusta" a basse emissioni di carbonio. Per farlo è, infatti, fondamentale un'analisi della consapevolezza politica sul tema dell'energia, un'analisi economico-comportamentale dei cittadini e poi della problematica situazione di governance europea del tema.

Non bastano le evidenze scientifiche per guidare l'attuazione delle politiche verdi. Infatti, spesso la mancanza di consapevolezza politica nel processo di progettazione di queste politiche costituisce un ostacolo che spesso porta all'inazione nei confronti del cambiamento climatico o all'attuazione di politiche che presentano sfide distributive. La premessa di partenza è che se gli effetti distributivi influenzano le preferenze politiche e, in ultima analisi, l'accettabilità politica, anche altri fattori, come l'ideologia, l'identità, i pregiudizi e la fiducia nei governi, sono significativi. In primo luogo, i cittadini devono essere pienamente consapevoli delle inefficienze delle attuali politiche energetiche, come i sussidi ai combustibili fossili, che sono molto più regressivi di una tassa sulle auto o di un piano di scambio di emissioni con asta. In secondo luogo, quando vengono effettivamente monetizzati, gli effetti positivi sulla salute superano le possibili perdite finanziarie, anche se sono raramente menzionati nel dibattito pubblico sulla legislazione ambientale.

Ciò richiede, inoltre, la valutazione di come i beni sociali, come l'energia, e i danni, come i costi delle politiche sia in ambito sociale che economico, siano distribuiti nella società, nonché di come queste distribuzioni si discostino da quelle appropriate e giuste, comprese quelle che riflettono i principi di necessità. Ad esempio, se si considera che uno specifico insieme di servizi energetici essenziali costituisce un requisito vitale per garantire a tutti un ambiente pulito e sicuro in cui vivere, la povertà energetica viene di conseguenza considerata una violazione di un diritto universale fondamentale, come la sicurezza fisica. Sebbene i responsabili politici siano essenziali per lo sviluppo di una giusta transizione energetica, tutte le parti coinvolte, in particolare i cittadini, svolgono un ruolo fondamentale nel processo di operazionalizzazione. In primo luogo, le preferenze dei cittadini

riguardo ai costi e ai benefici di un certo pacchetto di politiche sono eterogenee: pertanto, è più probabile che trovi il sostegno del pubblico in generale se la politica proposta tiene sufficientemente e accuratamente conto della caratteristica della variabilità, è difficilmente applicabile e determina il problema dell'accettabilità analizzata. In secondo luogo, la mancanza di riconoscimento e di equità procedurale pone le basi per una distribuzione diseguale dei servizi energetici nella società. Se le richieste energetiche differenziate non sono sufficientemente considerate nella progettazione delle politiche, i trasferimenti possono essere assegnati in modo errato e la povertà energetica può continuare (problema del targeting).

Infine, da un punto di vista della governance europea, le basi per la giustizia energetica sono state poste dall'attuale Strategia Energetica dell'UE. Dall'inizio del 2010, sono state infatti intraprese iniziative per stabilire fermamente la protezione dei clienti vulnerabili, spesso però considerate inefficaci e le ragioni di questo fallimento possono essere ricondotte all'influenza del Green Deal sul processo decisionale dell'UE. Quest'ultima si basa in modo significativo sull'esperienza e sull'enfasi normativa della Commissione, mentre gli Stati membri sono gli unici responsabili della politica sociale. Da una parte, secondo uno studio comparativo condotto da Kyprianou et al. (2019), le misure regionali per ridurre la povertà energetica hanno più successo di quelle a livello nazionale. Inoltre, nonostante il desiderio dell'UE di un quadro paneuropeo e coerente, le direttive dell'UE che discutono della povertà energetica non si riferiscono specificamente ai consumatori vulnerabili, ma piuttosto ai consumatori a rischio di povertà energetica in generale. Ciò rappresenta un grave difetto perché questa ambiguità viene successivamente tradotta in leggi nazionali, creando misure sbagliate. Tuttavia, secondo Bouzarovski (2018), le competenze della Commissione in materia di mercato dell'energia continuano a essere incentrate sullo sviluppo di un mercato integrato, rendendo le sue politiche unilaterali, legiferando sul mercato interno e concedendo agli Stati membri maggiore autonomia per le soluzioni di politica sociale. Inoltre, le disparità interstatali derivanti dal prisma energetico all'interno dell'UE presentano ulteriori ostacoli: la situazione socio-economica tra i Paesi dell'Europa nord-occidentale e quelli del sud-est è diverso, come dimostrano gli obiettivi politici in materia di energia in queste nazioni. A causa della riluttanza degli Stati membri a cedere la propria sovranità, i piani della Commissione, compresa la diffusione delle fonti di energia rinnovabili, non possono includere ulteriori misure invasive. Questo è evidente perché le già citate differenze nei modelli di comportamento politico, sociale ed economico richiederebbero sacrifici che poche nazioni sono disposte a fare.