

UNIVERSITY OF TARTU
Faculty of Social Sciences
Johan Skytte Institute of Political Studies

Julia Noelle Suzuki

Just Transition as a Political Strategy: Just Transition Initiatives and Citizens' Climate Policy
Preferences in the U.S.

MA thesis

Supervisor: Martin Mölder, PhD

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Authorship Declaration

I have prepared this thesis independently. All the views of other authors, as well as data from literary sources and elsewhere, have been cited.

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Name: Julia Noelle Suzuki

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Abstract

This thesis empirically investigates whether just transition initiatives, designed to ease the socioeconomic impact of decarbonization on fossil fuel-dependent communities, can influence public support for climate policies in the United States. Against the backdrop of a politicized climate change discourse and opposition from fossil fuel communities, the study explores whether measures with justice targeting these communities can mitigate resistance to climate policies. Using data from the Climate Change in the American Mind (CCAM) survey and funding data on two federal just transition initiatives, this research applies a quantitative method across U.S. census regions to analyze shifts in citizens' policy preferences before and after the just transition initiatives took place. Results suggest that the medium and highly funded regions had a smaller increase in policy support relative to low-funded regions. Thus, the effectiveness of just transition initiatives as a strategy to overcome climate policy opposition is yet to be seen. The findings highlight the need for more targeted, long-term, and consistent implementation and contribute to the field by suggesting future research directions.

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Introduction

Climate change is considered one of society's largest problems, not because it is technically impossible to combat, but because of the lack of political consensus (Jordan et al., 2022). Environmental policy has long been politicized in many countries, but human-induced climate change is an especially complex problem. Some call it "super wicked" because of its scale and long-term uncertainties across territories and jurisdictions (Levin et al., 2012). While the necessity of climate policy is widely recognized at the international, national, and local levels, those in industries that will require phasing out could feel threatened by the movement. Consequently, they turn to political actors who will protect the status quo, deepening political disagreements. Climate change's political complexity is exacerbated through the fueling of climate skepticism and partisan division by fossil fuel actors and their sponsors, despite nearly all scientists agreeing that the effect of human activities on global warming cannot be denied (Dunlap et al., 2016; Huber et al., 2020). Threatened incumbent actors are heavily investing in upholding their worldview through strategies like lobbying and spreading anti-climate change information (McCright & Dunlap, 2003). The incumbent's narrative resonates with citizens who have economic or emotional ties to fossil fuels, who are then mobilized to counter climate policies and protect the status quo.

The "just transition" concept acknowledges this challenge by addressing the socioeconomic, political, and institutional side effects of a transition to a low or zero-carbon society (Newell & Mulvaney, 2013). With past energy transitions resulting in inequities lasting beyond the time of the transition itself, those negatively affected ought to resist (Cha, 2020). For example, the International Labour Organization estimated that the societal transition to minimize the effects of climate change would lead to 6 million job losses globally, concentrated in high-carbon industries (European Bank for Reconstruction and Development, 2020). Limiting fossil fuel usage and replacing it with renewable energy often seems like a "punishment" to those relying on fossil fuel production, especially because the most negative impacts of climate change are geographically and temporally distant from high-emitters (Olson-Hazboun, 2018). In light of these reactions, a primary example of a just transition initiative is to compensate fossil fuel workers who lost their jobs because of the replacement by renewable energy. Another example is to retrain those workers so they can find an opportunity in a different field. These initiatives are designed to minimize losses and raise fairness during a rapid societal transition.

In addition to the normative necessity for a just transition, just transition initiatives could also be seen as a political strategy to overcome potential opposition in a transition. Past societal transitions show that deep changes lacking legitimacy and acceptance lead to social unrest (Boasson & Tatham, 2023). Notably, surveys have shown a geographical divide over climate policies, in which rural voters are against government oversight unless they see benefits for their own community (Diamond et al., 2020). Thus, whether just transition efforts can overcome the opposition of climate change and enable a successful transition is of high interest to policymakers. Relevant literature has suggested that climate policies could gain more support from citizens, combined with initiatives emphasizing fairness for those affected by a transition (Bergquist et al., 2022; Gazmararian, 2024; Swim & Geiger, 2021). Still, while several qualitative studies have contributed significantly to the just transition literature (e.g. Cha, 2020; Crowe & Li, 2020; Mayer, 2018; Schuster et al., 2023), the field remains largely conceptual and provides fragmented empirical evidence. Thus, it is less clear whether these suggestions materialize for millions of fossil fuel industry workers and their communities.

The objective of this thesis is to contribute an empirical examination of whether just initiatives could overcome citizens' resistance to climate policies. This thesis will focus on just transition initiatives targeting energy communities (i.e., fossil fuel workers and communities), the most politicized and successful counter-movement community to climate change politics. The main research question is: How do just transition initiatives influence citizens' preferences for climate policy? This question will be examined by distinguishing between U.S. regions targeted and not targeted by federal just transition initiatives, and then analyzing the change in each region's citizens' policy preferences over time. Policy preferences are measured through the Climate Change in the American Mind (CCAM) dataset, a representative dataset collected by the Yale Program on Climate Change and Communication and the George Mason University Center for Climate Change Communication. Established control variables—political affiliation, gender, education level, and income—are included to isolate the initiatives' effects as much as possible. However, due to constraints on the study design, the results should not be interpreted as proof of causality, but rather as exploratory evidence to guide further research.

This thesis has three main chapters. The first chapter will provide findings from prior academic studies. It will introduce how climate change became politicized and why the necessity of a just

transition emerged. Then, it will define just transition for this study by referring to arguments made in the relevant literature. The following section will be devoted to understanding previously known determinants of citizens' attitudes towards climate policies. The chapter concludes by summarizing key points from the literature and generating a hypothesis to be tested in this study. The second chapter will explain the research design to test the hypothesis. This chapter will include an explanation of case selection, independent and dependent variables, data sources, method, and research design limitations. The third chapter will present empirical results obtained from the analysis of how just transition initiatives influence citizens' attitudes toward climate policies. It will include a section for descriptive analyses of the dataset used for the analysis, followed by the results for the statistical analyses of how policy preferences change over time depending on the region. This chapter will also discuss the results further in light of the theoretical and practical implications and limitations of the findings. Finally, this thesis will conclude by reiterating the research puzzle and results, addressing the limitations, and suggesting future study directions to develop the field.

1. Climate Change: Politics, Justice, and Citizen Preferences

To analyze how just transition initiatives influence citizens' attitudes toward climate policies, this first chapter reviews previous findings in the relevant literature. Three main themes are examined: climate change politics, just transition, and public opinion of climate change. To begin, I review how climate change politics has evolved to reach its current politicized condition by organizing the key interests involved in the political struggle. Then, I define the concept of a just transition and outline how it became necessary in climate change politics. In the following section, I discuss how climate policy has been categorized by scholars and present the known determinants of citizens' preferences for climate policies. To conclude the first chapter, I summarize the key points in the literature to build the hypothesis to be explored in this thesis.

1.1. The Politics of Climate Change

Climate change is felt around the globe. In a recent worldwide survey by the United Nations Development Programme, the majority of people in most countries said they were more worried about climate change than a year ago. Nearly half of the people felt extreme weather events were worse than the previous year, and more than two-thirds said climate change impacts their big decisions, such as where to live or work (Flynn et al., 2024). The phenomena causing these feelings are evident in climate monitoring data. For example, the World Meteorological Organization (2024) reported that 2023 was the warmest year on record, and the rate of sea-level rise in 10 years has more than doubled from 1993 to 2023. Disasters related to extreme weather, such as major floods, extreme heat and drought, and wildfires, are leaving socioeconomic impacts on all continents of the world.

The increased frequency of extreme weather has been attributed to climate change caused by human activities, mainly burning fossil fuels for energy. This is scientifically undeniable: An analysis of peer-reviewed articles about climate change reached the conclusion that there is a 99% scientific consensus on human-induced climate change (Lynas et al., 2021). A renowned voice on climate science, the Intergovernmental Panel on Climate Change, reports that “human activities, principally through emissions of greenhouse gases, have unequivocally caused global warming” (Calvin et al., 2023, p. 4). The same report warns policymakers that without “deep, rapid, and sustained reductions in greenhouse gas emissions”, climate-related risks will continue to increase in frequency (Calvin et al., 2023, p. 12). These findings have led to the acknowledgment that the

urgent halting of climate change requires a multi-level societal transition involving political, economic, cultural, and technical aspects. To undertake the significant changes, policymakers need climate policies—governmental and institutional measures designed to address the causes and consequences of climate change. Climate policies include mitigation policies, which aim to reduce greenhouse gas emissions, and adaptation policies, which seek to manage and minimize the impacts of climate change on societies and ecosystems (Bréchet et al., 2013).

However, climate policies have faced challenges over the years, leading to some scholars calling it “super wicked” (Levin et al., 2012). According to Moser (2010), several characteristics make climate change difficult to communicate to the public and reach a collective agreement. Firstly, climate change’s causes (i.e., greenhouse gases in the atmosphere) are invisible, and impacts are geographically and temporally distant from the high-emitters. People living in industrialized countries can conceal themselves from impacts through structural means or insurance, simultaneously making them less likely to notice incremental changes in the environment. Additionally, today’s preventative actions only reap benefits in the distant future, making it difficult to accept immediate substantial investments. Secondly, climate change is uncertain and complex. Because climate change is not dictated by human-made boundaries, climate action requires collaboration across industries, territories, populations, and jurisdictions. Most proposed solutions are untested, costly, and require long-term collaboration. Moreover, decarbonization means halting the growth-oriented economy and remaking the entire industrial system. This unprecedented global challenge leads to apathy and the tendency to desire inertia instead of action.

Climate change’s communicative challenges help explain why it is also a political challenge. The difficulty of communicating it to the public makes it onerous to balance conflicting interests and gain widespread consensus on moving forward (Jordan et al., 2022). The geographically and temporally distant impacts disincentivize politicians, who tend to shun projects that cannot reap short-term success, aligning with their electoral cycles. Governments find it difficult to justify the upfront expenditure for climate policy to the public and must keep mitigation costs proportionate to the costs of avoided damages (Falkner, 2016). Yet, as various actors have reacted to climate change over the decades, it has risen to one of the top priorities in global governance and in many national governments. This is observed in international frameworks and targets successfully implemented after years of negotiation. In 2024, 107 countries that were responsible for more than

80 percent of GHG emissions had committed to achieving net-zero emissions, a status where the amount of greenhouse gas emissions and removals are equal (United Nations, n.d.).

Despite the movement to prevent catastrophic environmental outcomes, the changes have brought additional conflicts, causing new political problems that must be considered. In this section, I first provide an overview of global climate change politics, which is useful in understanding the large picture of global politics that has driven domestic politics to combat climate change. Then, in a more theoretical scope, I review how scholars have studied the political struggle over climate change and how it leads to just transition debates.

1.1.1. Global Politics

Global climate politics has played a significant role in recognizing scientific findings, responding to public demand, and pushing national governments to adopt climate policies. At the same time, it has fueled the resistance to climate policies by posing a realistic threat to actors benefitting from high-carbon economies. This subsection will present the shift of global climate politics over the years, from scientific awareness to increasingly ambitious collaborative frameworks, with four notable milestones marking the course.

The first milestone in the recent history of global climate change politics came in 1988 when the Intergovernmental Panel on Climate Change (IPCC) was established. Prior to this moment, only a limited number of scientists were paying attention to climate change. The formation of the IPCC is significant because it was the first time climate change became intergovernmental and political (Bodansky, 2001). It has since provided scientific evidence for countries to track their progress to avoid catastrophic outcomes. However, the involvement of national governments made each nation's domestic interests apparent in a split in positions. On one side were European countries, Canada, Australia, and New Zealand, advocating for targets to limit greenhouse gas emissions. On the other side was the U.S., joined by Japan and the former Soviet Union, questioning the rigidity and feasibility of the targets put forward. Bodansky (2001) argues that this difference in positions emerged partially due to the interaction with domestic politics. While the former group of countries deployed environmental and foreign ministries to lead negotiations, the U.S. counterparts included energy stakeholders who stressed the economic burdens over environmental priorities.

Following the apparent division in IPCC among industrialized nations, further contestation became clear in the second milestone when the discussions moved to the United Nations General Assembly in the 1990s. Now, developing countries have joined the political discourse. Again, domestic interests play a significant role in each nation's position: small island states cautious of rising sea levels pushed for strict targets; oil-producing states advocated for slower implementations to avoid export shrinkage; and emerging economies such as Brazil, China, and India insisted on more responsibility from industrialized countries that emitted much greenhouse gases in the past. Nevertheless, in Rio de Janeiro in 1992, representatives agreed that human beings are "entitled to a healthy and productive life in harmony with nature" through sustainable development, and states have "common but differentiated responsibilities" to restore the ecosystem (United Nations Conference on Environment and Development, 1993, pp. 3–5). Simultaneously, an institutional framework for international climate policy, the Framework Convention on Climate Change, was adopted as a treaty to stabilize greenhouse gas emissions (United Nations, 1992). These developments uplifted global climate change politics and laid the first normative foundations for future global climate policy.

The third milestone was the 1997 Kyoto Protocol, an international treaty with legally binding emission targets for industrialized countries to be achieved from 2008 to 2012. While the proponents celebrated the agreement, many were critical of the Protocol. Tough compromises were made through negotiations to break stalemates or avoid discarding the whole premise. Notably, the U.S. sought the so-called emissions trading mechanism, which would allow industrialized countries to indirectly achieve their emission reduction target by purchasing other countries' reduction efforts. This mechanism would reduce industrialized countries' responsibility to restrict economic activities and fossil fuel production, and continue business as usual by paying other countries to carry the burden. Eventually, despite the EU and developing countries' opposition, limitless emission trading was permitted through the Clean Development Mechanism (Bodansky, 2001; Böhringer, 2003). The conditions of the Kyoto Protocol contributed to bringing the climate policy debate to national parliaments, signifying a key moment in the widening domestic climate politics and public interests. Public knowledge and familiarity grew in countries and regions that launched communication campaigns to educate the public on climate change. Contrarily, some countries, including the U.S., experienced uncoordinated and contradictory messages sent from

varying interest groups (Moser, 2010). In the following years, the limits of global cooperation became clearer as greenhouse gas emissions steadily rose.

The fourth milestone, the 2015 Paris Agreement signed during the 21st Conference of the Parties (COP), represented a breakthrough in a gridlock of global climate politics. The Agreement succeeded in nations collectively committing to limit global temperature increase to 2 °C by 2100 and pursuing efforts to limit the increase to 1.5 °C. The negotiations to reach this Agreement were built on the realization that “none of the major powers can be forced into drastic emission cuts”; therefore, it introduced voluntary pledges relying on the hope that countries will autonomously limit their emissions through “naming and shaming” pressures (Falkner, 2016, pp. 1107–1108). In part, the Paris success could be attributed to grassroots non-governmental movements, which were activated in response to previous negotiation failures like the 2009 Copenhagen Summit (Bond, 2010). Responding to public demands, the Paris Agreement adopted inclusive language and mechanisms to engage all levels of government and various actors to formulate national climate plans. This marked the beginning of a hybrid climate governance between top-down and bottom-up approaches (Bäckstrand et al., 2017). By 2015, national governments recognized that introducing climate policies was unavoidable, and policymaking spread to more regional and local levels to match local conditions.

These four milestones over 20 years signify the progress made to reach a global consensus to combat climate change. The global political conversation and scientific discoveries heavily influenced domestic political discourse and public engagement. However, the opposition evolved in correlation with the successful agenda-setting in climate change politics, as the interests of the status quo were increasingly threatened. The next subsection will describe the conflicting interests in climate change politics that intensified in response to the global consensus to phase out fossil fuel industries.

1.1.2. Power Struggle in Climate Change Politics

For decades, scholars have recognized the difficulty of climate change politics. Climate change scholars point out that responding to climate change is “the first instance of societies collectively seeking a dramatic transformation of the entire global economy”, making it an unprecedented challenge for humankind (Newell & Paterson, 2010, p. 1). Climate change requires expensive preventative action to a threat that lacks temporal and geographical proximity to many citizens in

industrialized countries (Moser, 2010). In addition, mitigation policies consist of penalizing greenhouse gas emissions, which are tied to fuel production and other carbon-intensive industries (VijayaVenkataRaman et al., 2012). These factors have led to deep societal divides on how to respond to climate change. In this subsection, I will describe how the key interests in climate change politics interact to gain dominance over how to manage climate change.

The relationship of competing interests in climate change politics can be understood through the perspective of political opportunity structure. While relevant literature includes important dimensions of the power struggle for decarbonization, such as the disproportionate harm to vulnerable groups through environmental degradation and transitions, the uneven cost distribution among countries and continents, or the impact on non-vocal groups like future generations or animals, to name a few, these discussions are beyond the scope of this paper. Therefore, the focus will be on illustrating the interplay between the key interests of climate change politics by referring to Meyer and Staggenborg's work (1996) on movement-counter movement interactions and Brulle's (2020) elaboration on cultural hegemony. In this scope, the key interests in climate change politics can be broadly categorized based on their stance toward climate policies, distinguishing between advocates, who support policies to reduce emissions and enhance resilience, and opponents, who resist such efforts due to economic, political, or ideological reasons. Furthermore, the development of these interests can be explained as the interests of incumbents, who have benefited from the high-carbon economy; challengers, who challenge the dominant narrative in light of scientific evidence of climate change; and counter movements, which the threatened incumbent mobilizes against challengers.

Incumbent, Challenger, and Counter movement

The relationship of competing interests in climate change politics can be understood through the perspective of hegemony, a theory ventured by Antonio Gramsci in the early 20th century and later developed by many scholars. Gramsci theorized that societies are “not ruled by force alone, but also by ideas”, which is increasingly relevant in modern societies (Bates, 1975, p. 351). He used hegemony to explain the power dynamics in society, how socio-political orders prevail over time, and how one group succeeds in ruling over others without relying on violence or coercion. Instead of force, he emphasized that intellectuals formulate cultural systems that provide stable and legitimate regimes that stay in power (Howson & Smith, 2008). Building on this theory, Brulle

(2020) organizes climate change politics as a power contest between incumbents with a hegemonic worldview of economic growth through unlimited carbon emissions, who invest in sustaining their worldview through knowledge production and culture, and challengers who propose the alternative idea of transitioning to a low-carbon society.

Incumbents seek to uphold the stable societal order and actively create barriers against meaningful policy action that could bring an alternative framing to the agenda (Brulle, 2020). In climate change politics, the key incumbent that benefits from the status quo is carbon-intensive industries, specifically the fossil fuel industry. Since the Industrial Revolution, fossil fuels have generated energy to industrialize and develop our societies at an unprecedented speed. The benefits of rapid development through burning fossil fuels were undoubted until releasing carbon, among other greenhouse gases, into the atmosphere became known to be the largest contributor to anthropogenic climate change. This finding prompted actors to challenge the incumbent's dominant worldview, which promoted and legitimized endless greenhouse gas emissions.

Challengers use social movements to bring an alternative understanding of the status quo to transform the dominant worldview (Brulle, 2020). In climate change politics, challengers develop an alternative narrative by campaigning for a transition to a low-carbon society. They advocate for the "End of Coal" and to replace it with "a more democratic, decentralized, and decarbonized energy system" to avoid catastrophic outcomes (Evans & Phelan, 2016, p. 330). This fundamentally contradicts the incumbent's status quo, which promotes a carbon-intensive production system. The challenger's origin, climate change activism, is usually linked to grassroots environmental movements and environmental justice movements, which are traced to the 1960s through the 1980s (Staggenborg, 2020). These movements gained legitimacy to certifiably challenge the incumbent's worldview when combined with scientific evidence of global warming provided by climate scientists, as outlined in the previous section (McAdam, 2017).

Climate change activism can take the form of attending a climate change rally or meeting, contacting elected representatives, supporting organizations working on the issue, and, in recent years, communicating the issue on social media (Roser-Renouf et al., 2014). The youth play a key role in challenging the response to climate change, as they are exposed to existential threats of climate change their entire lives, and they are constantly warned about the worsening conditions of their planet and future resource scarcity. In many cases, they experience physical danger through

natural disasters like droughts, wildfires, and floods, and recent studies show their mental health and well-being are negatively impacted by climate change (Majeed & Lee, 2017). Youth activists, who are often unable to vote in elections due to minimum age requirements, employ alternative methods to express their stance. Some crucial movements are “climate strikes”—led by Greta Thunberg from 2018 to boycott school classes on Fridays—demanding climate change action by policymakers, lawsuits against fossil fuel companies and governments to compensate for previous inaction, attending conferences as a youth representative, and the effective use of social media to spread information (Han & Ahn, 2020). Youth activists emphasize the injustice of future generations suffering from past generations’ inaction, and they advocate for making climate change a salient issue in policymaking, prodding urgent action. These efforts by actors like grassroots activists, climate scientists, and youth activists led to the incumbent’s worldview being threatened by the challenger’s movement, to the point where a countermovement is mobilized.

A *countermovement* is a movement in opposition to another movement. While scholars have established that movements with any level of impact could spark countermovements, Meyer and Staggenborg (1996) demonstrate that three conditions allow those countermovements to be successful: there are signs of success in the original movement, the movement threatens the interests of some of the population, and there are resources available by political allies to the countermovement. In the context of climate change, the countermovement is identified as an elite-driven (i.e., fossil fuel industries and conservative actors) effort “to mobilize economically impacted populations or populations that share similar interests or ideologies” (Brulle, 2020, p. 329). As the scientific community raised awareness, climate change rose to the global political agenda, and climate activists protested to take meaningful action, the incumbent saw signs of the challenger’s movement succeeding in violating its interests.

In response, the incumbent employed a myriad of activities to “define global warming as non-problematic” (McCright & Dunlap, 2003, p. 349). This can be analyzed as the incumbent’s effort to mobilize a countermovement with the aim of maintaining the currently dominant worldview of economic development and climate change politics (Brulle, 2020). Studies have demonstrated that fossil fuel industries have invested millions to delay climate policy. For example, fossil fuel firms like Exxon Mobil, Chevron, and Royal Dutch Shell spent over 10 million dollars annually from

2009 to 2018 to lobby against the transition to renewable energy (Lantushenko & Schellhorn, 2023).

For informational tactics, conservative think tanks with heavy ties to the fossil fuel industry have employed activities to preserve the incumbent's narratives and back their position, such as policy forums, press conferences, and press releases (McCright & Dunlap, 2003). Utilizing this seemingly "expert" information to counter climate change's legitimacy, the incumbent has heavily invested in spreading the counter-narrative to mobilize sympathizers. Furthermore, right-wing media's activities in spreading anti-environmental and anti-climate change information have significantly increased over the decades (Chinn et al., 2020), misinformation about climate change on social media is on the rise (Treen et al., 2020), and climate change has become a politically polarized issue (Falkenberg et al., 2022). These findings show that the incumbent in climate change politics has been successful in creating a countermovement by making climate change a politically salient issue that a large population stands in favor of the incumbent's worldview. If power is considered as the "(in)capacity of actors to mobilize other actors, resources, and/or institutions to achieve outcomes", the incumbent's capacity to mobilize a countermovement shows its unceasing possession of power (Avelino et al., 2024, p. 531).

The strong countermovement blocking climate policy creates a need for counter-strategies by the challengers to overcome the countermovement (Meyer & Staggenborg, 1996). One approach to understanding counter-strategies is through ideas about transition management. The challengers are tasked to figure out how to bring a new (low-carbon) sociotechnical regime to the forefront by dismantling and replacing the currently dominant (high-carbon) one. However, the incumbent's position is appealing to many who are economically impacted by climate policies (Brulle, 2020). Thus, an effective transition management strategy that addresses these concerns enough to overcome the opposition becomes important to the challengers.

This conclusion leads to the importance of a just transition in climate change politics, which recognizes and tries to overcome the countermovement population's grievances. If the emphasis on justice could soothe transitional damage to the countermovement population enough to change their stance on climate policies, then just transition initiatives could be a powerful counter-strategy for the challengers. Building on the discussion about the power struggle between incumbents,

challengers, and countermovements, the next section will examine just transition and how it could act as a counter-strategy to overcome countermovements in climate change politics.

1.2. Just Transition

In light of the power struggle in climate change politics, a focus on transitional justice could be seen as a strategy to overcome grievances experienced by citizens who benefit from the status quo. Drawing on relevant scholarship, this section engages with the concept of just transition to provide a definition for this study, places just transition in climate change politics, and provides empirical examples of just transition initiatives.

1.2.1. Just Transition Definition

Before delineating empirical findings, it is important to define what a just transition is. Justice is “inherently complex and subject to interpretation”, depending on the social, political, and cultural dynamics involved (Avelino et al., 2024, p. 522). Both “just” and “transition” entail a long list of scholarly debates, and the just energy transition literature, which I mainly refer to in this paper, has only recently begun reaching conceptual consensus (Wang & Lo, 2021). Therefore, it is crucial to outline different approaches to the concept before defining it for this research.

Beginning with the concept of what is “just”, some sections of scholarship about social justice are heavily influenced by John Rawls’s *A Theory of Justice* (1971), where he proposed two principles of justice. Firstly, Rawls argues that all individuals in a society should have the following basic liberties: political liberty, liberty of conscience and freedom of thought, the right to hold personal property, and treatment under the rule of law. Secondly, social and economic inequalities should be arranged not equally but to everyone’s advantage, and positions of authority and offices of command must be accessible to all (Rosen et al., 1999). Rawls’s difference principle, which emphasizes fairness and equity over mere equality, is insightful in understanding the necessity to attend to individual circumstances instead of using a one-size-fits-all approach.

Additionally, justice should be understood through varying dimensions. Post-structuralist approaches highlight that social differentiation based on race, ethnicity, gender, religion, and culture needs to be considered for redistribution or recognition to ensure a just society (Fainstein, 2014). Contrasting with Rawls’s and post-structuralists’ nuanced approach are other theories measuring justice by the total outcome, such as utilitarianism by John Stuart Mill, which aims to

produce the greatest good of the greatest number, or focusing on process over outcome, like the libertarian approach by Robert Nozick. Some scholars emphasize the conditions that enable justice, like Guttman and Thompson on deliberative democracy, which specifies the necessity of equal opportunity as a condition for deliberation to function, or the capabilities approach proposed by Amartya Sen and developed by Martha Nussbaum, which focused on social justice in terms of what people have the capability to do, regardless of their actual exercise of these capabilities (Fainstein, 2014). The ability to take political action has been discussed by scholars like Iris Marion Young and Chantal Mouffe, who argued that the inability to mobilize oppresses citizens and takes away collective identities (McKinnon, 2012). The scholarly focus on varying aspects, from process, outcome, sector, and social characteristics, has led to today's discussion around justice by understanding the importance of multidimensional approaches.

Following with what “transition” entails, referring to earlier scholars borrowing from sociotechnical transition literature, a society undergoes a “transition” when there is a “structural change in major societal subsystems” accompanied by a deep shift in social, cultural, infrastructural, scientific, and technical practices (Meadowcroft, 2009, p. 324; Newell & Mulvaney, 2013). A transition usually involves a long period of complex back-and-forth reconfigurations of practices, which is not always linear. Societal transitions can create grave injustices for certain groups of people, in most cases for underrepresented or minority groups who have difficulties expressing their needs during deep changes. Through these expected challenges, an attention to justice leads to identifying those who are “vulnerable and at risk from experiencing injustices in the process” of a transition (Avelino et al., 2024, p. 524).

A just transition, then, can be understood as a societal transition that ensures a fair and equitable process and outcome for all members of a society. It can be achieved in many ways, such as public policy, economic activities, or political processes, depending on the sphere of the transition. In terms of shifting towards a low or zero-carbon society, just transition aims for fairness and equity for “major global justice concerns such as (but not limited to) ethnicity, income, gender within both developed and developing contexts” (McCauley & Heffron, 2018, p. 2). The scope could vary from “micro (innovation), meso (social networks, rules and technical elements) and macro (exogenous environment) levels” involving sectors and actors such as energy, infrastructure, markets, services, and agents (García-García et al., 2020).

Specific to a transition towards post-carbon societies, McCauley and Heffron (2018) identify three prominent justice scholarships: environmental justice, climate justice, and energy justice. Environmental justice dates back to the 1970s and 1980s in the United States, with community resistance movements against toxic waste disposal, which urged civil rights movements and environmental groups to join forces to advocate for a just transition. In the coming decades, the movement was adopted by urban environmental groups, indigenous groups, and socio-economic justice movements that “rejected the conception of the environment as wilderness and entirely void of race and class issues” (Dwarkasing, 2023, p. 2).

The climate justice scholarship emerged from environmental justice following evidence for anthropogenic global warming. Climate justice focuses on the causes of climate change and the inequality of responsibility and accountability, as “the impacts of climate change are most severe on those with the least responsibility for causing it, and who are often excluded from decision-making processes regarding climate mitigation and climate adaptation” (Van Bommel & Höffken, 2023, p. 2). Finally, energy justice emphasizes the fairness of benefits and costs of energy services, but also for decision-making processes in energy extraction, generation, and disposal (Van Bommel & Höffken, 2023). Because the transition to a low or post-carbon society could only be achieved through drastically changing how we produce and consume energy, scholars have studied how to achieve a just transition for energy actors.

To analyze just transitions in these subfields, scholars have identified four dimensions of justice necessary to ensure a just transition, in line with previous scholarship about justice theories: distributive justice, procedural justice, restorative justice, and recognition justice (García-García et al., 2020; McCauley & Heffron, 2018; Van Bommel & Höffken, 2023). Distributive justice refers to the distribution of positive and negative aspects of a transition, such as the risks, responsibilities, and benefits. Distributive justice in the energy transition can highlight a “double inequality” in which those with more responsibility burden lower risks and vice versa; for example, some industries that have thrived with affordable fossil fuel energy are more prepared to transition to renewable energy than industries that have invested in fossil fuel production facilities to support industrial development.

Procedural justice builds on distributive justice by enabling a “platform for justice demands”, which involves the participation of all stakeholders in the process of transitional policy

development (McCauley & Heffron, 2018, p. 4). In other words, procedural justice centers around “throughput legitimacy”, judged by the “inclusiveness and openness of governance processes” rather than the input or the output of a policy (Schmidt & Wood, 2019, p. 728). It is often qualitative and context-specific in nature, depending on the site of transition.

Recognition justice emphasizes recognizing who is negatively affected by the transition. As García-García and colleagues (2020, p. 3) describe, recognition justice involves deciding who is treated unjustly, or “the delimitation of adversely affected collectives” in a transition. Recognition justice leads to understanding multiple and sometimes conflicting perspectives of ensuring justice in transitions. For example, one labor union could advocate for preventing mine closures to avoid job loss, while another union could tackle future unemployment by training workers for new industries. Finally, restorative justice aims to “repair the harm” caused through transitions, “rather than simply focusing upon punishing the offender” (McCauley & Heffron, 2018, p. 5). It has motivated conversations about creative ways to amend past injustices and pushed actors to consider the consequences of future actions. Restorative justice has synergy, especially with procedural justice, as the process of meaningful conversations to understand the local community’s needs often leads to restorative efforts.

This study aims to understand how focusing on justice in transitioning to a low-carbon society could overcome citizens’ opposition to climate policies. In relation to my specific focus, I define just transition as: a transition away from fossil fuel energy sources, which ensures a fair outcome for communities with strong economic ties to the fossil fuel industry. Just transition initiatives are defined as governance efforts by the national government aimed at ensuring a just transition. Combining the conceptual knowledge about just transitions and discussions about climate change politics from the previous section, the next subsection will discuss the politics of transitioning away from a fossil fuel-oriented economy.

1.2.2. The Politics of Just Transition

As demonstrated in the power struggle in climate change politics, centralizing just transition in the political narrative is inevitable. The International Labour Organization estimated that the societal transition to minimize the effects of climate change would lead to six million job losses globally, concentrated in high-carbon industries (European Bank for Reconstruction and Development, 2020). Many just transition scholars agree that the focus on workers is an essential part because

the general perception of a trade-off between the environment and the economy creates hostility among workers against climate change mitigation policies (García-García et al., 2020; Newell & Mulvaney, 2013; Van Bommel & Höffken, 2023). Past studies show that mine closures are accompanied by community-level social instability, alienation, and apathy, not limited to the industry workers (Haney & Shkaratan, 2003). And as Gazmararian (2024, p. 2) argues, the fossil fuel community's attitudes "shape the electoral incentives that leaders have to support climate policy", leading to mobilizing large countermovements being a powerful strategy for the incumbent. Regardless of one's motive for a transition, all are forced to face workers who contributed to past industrial developments before moving forward.

While inequalities are imminent regardless of the nature of a transition, a government-led transition to a carbon-neutral society is uniquely sensitive in several ways. First, climate change's urgency requires a rapid transition compared to past societal transitions that spanned over generations. The mere 35 years between the Paris Agreement in 2015 and the zero-carbon society goal by 2050 (and 15 years for earlier and more ambitious goals in 2030) easily translates to radical consequences within one person's lifetime, particularly for those with a career in high-carbon sectors. Second, the politicization of climate change has led to a wider population outside of affected communities to question the transitional efforts. With politicians seizing fossil fuel communities' discontent and feeding into the climate skepticism narrative, the opposition is amplified, and the transition becomes more challenging. Third, the complexity and uncertainty of climate change make it hard to persuade citizens to support solutions for unseen long-term consequences (Perry, 2015). Under these conditions, citizens are more likely to prioritize kitchen-table issues like the economy, healthcare, and education (Newell & Feldman, 2023).

Despite the characteristics that make the transition unique, the call for a just transition is similar to other political issues by asking "who wins, who loses, how and why" in relation to decarbonization (Newell & Mulvaney, 2013, p. 2). As outlined in Section 1.1.2, the move away from fossil fuels heavily influences the lives of those supported by the fossil fuel industry. Just transition identifies those who will "lose" and aims to minimize the unjust outcomes as much as possible. In the energy transition, the movement to compensate those who will "lose" can be traced back decades; trade unions have been the earliest advocates of a just transition for the workers in industries affected by the energy transition. Trade union movements for a just transition started in the U.S. in the

1970s, sparked by concerns about the impact of environmental regulations and standards on jobs (Dwarkasing, 2023; García-García et al., 2020; McCauley & Heffron, 2018; Newell & Mulvaney, 2013). Merged with movements related to occupational safety and health concerns since the 1950s, some trade unions sought to ensure justice for workers by advocating for their well-being and job security.

Although workers recognized a trade-off between economic development (e.g., job security) and climate policies, some decided to join the discourse to promote “labor-friendly transformations of productive systems into low-carbon variants” because it was more politically feasible than dismissing the environmental movement altogether (Dwarkasing, 2023, p. 2). As Wang and Lo (2021, p. 2) state, some unions “saw the fate of the environment and of the workers as intertwined and decided to advocate for a just transition”. Some even argue that the just transition was a “mobilizing term” to promote investment in green jobs and shift from the declining fossil fuel industry, while ensuring jobs (McCauley & Heffron, 2018, p. 1). Thus, some trade unions accepted the transition to join a larger movement and try to minimize their losses. This political strategy was strengthened in the 1990s and onward through two broader international frameworks: the Sustainable Development Goals sponsored by the International Labour Organization, and the Just Transitions Alliances by the United Nations and the EU (García-García et al., 2020). The various frameworks provided a space for deliberation and expanded to include many factions other than labor, such as socialist, climate justice, environmental justice, feminist, decolonial, and indigenous groups, to join a coalition for a just transition (Wang & Lo, 2021).

However, studies have highlighted problems with trade unions being central to just transitions. Firstly, Kalt (2021) argues that compromising with demands from the labor faction slows down climate initiatives. Justice requires additional resources and the inclusion of various actors with competing interests, while climate change is an urgent issue that must be tackled as soon as possible. On this point, Van Bommel and Höffken’s (2023) review has found a complex dynamic between urgency, justice, and energy transitions. On the one hand, a hurried energy transition by policymakers could perpetuate injustices, such as surface-level solutions that do not address structural injustices. They also find that politicians sometimes use just transition discourses to delay energy transition policies. On the other hand, they find examples of rapid transitions bringing conventional injustices to light and enabling necessary policies to tackle them. The discussion

highlights the complex tradeoff between justice and speed and questions what level of deliberation is required in democratic societies.

Secondly, some communities have been found to have strong communal identities tied to the fossil fuel industry, extending beyond their economic reliance (Cha, 2020). When a local economy is centered around fossil fuels, related emotions such as pride and “mining identities” are formed, leading to support for fossil fuel continuation and a rejection of renewable energy (Olson-Hazboun, 2018, p. 367). Assuming trade unions will represent fossil fuel communities may undermine the transitional injustices that extend beyond labor-related issues, as it is unclear whether just transition initiatives can compensate for lost identities and gain the understanding of citizens in the community.

Combining the discussion about the politics of just transitions with the power struggle in climate change, it is important to acknowledge the grievances brought to light through a countermovement to climate policies. As Meadowcroft (2009, p. 328) argues, the more the policy develops, the stakeholders are “bound to be concerned with their own place in future arrangements”, and social and political struggles are “inevitable”. Especially with past energy transitions resulting in inequities lasting beyond the time of the transition itself, those negatively affected ought to resist (Cha, 2020). To policymakers who aim to implement climate policy, just transition efforts are not only for democratic purposes to ensure a fair and equitable transition for all. It is also for political purposes to enable a successful transition and achieve global commitments while ensuring re-election by satisfying their constituency's demands. In other words, just transition initiatives could be seen as a tool to overcome grievances by those involved in countermovements of climate policies. Through this lens, it is highly relevant whether or not just transition initiatives are effective in convincing citizens to agree with climate policies.

1.2.3. Just Transition in Action

Scholars have published a wide range of research regarding just transition. Still, a systematic review shows that existing studies are largely normative and descriptive, and there is a shortage of empirical studies and critical discussions skewed toward procedural justice, with a lack of recognition and distributive justice (Pai et al., 2020; Suboticki et al., 2023). To understand the current discussion surrounding just transition initiatives, this section examines academic literature

about just transition initiatives by focusing on the level of initiatives, who is central in the discourse, and how citizens perceive just transitions.

Level of the Initiatives

Just transition initiatives have been attempted at various scales, from local, national, intergovernmental, and international. Upon reviewing global just transition initiatives from 2015 to 2020, Krawchenko and Gordon (2021) built a typology of policy instruments used by governments to manage just transitions. They identify seven thematic policy areas for just transition, which are implemented at the national and broader regional levels: governance mechanisms, climate and sustainability planning, workforce development, economic development, regional and rural development, innovation and research, and social supports.

The same study finds that a just transition is a multi-level government challenge, but many countries lack coordination mechanisms between policy areas and/or jurisdictions. Additionally, out of the seven policy areas, they find that governments most commonly implement labor and environmental initiatives. While this suggests an accurate awareness of labor-oriented injustices, the authors point out the lack of societal initiatives that could combat deeper conflicts that may arise from transitions. As for the justice dimension (i.e., distributive, procedural, recognition, and restoration), their review touches upon examples of initiatives addressing procedural justice, the Just Transitions Commissioners in Wales, Scotland, and Ireland; and recognition justice, the Hapū/Iwi Resource Management Plan in the Bay of Plenty, New Zealand.

In a framework developed for workers and communities, Pollin and Callaci (2019) recommended that the U.S. government invest 50 billion dollars per year in just transition initiatives through three areas. Firstly, there should be support for workers facing retrenchments in the form of income, retraining, and relocation support. Secondly, the government should guarantee pensions for workers in fossil fuel and other adversely affected industries. And thirdly, the support should go beyond workers to aid effective transition programs for fossil fuel communities. Other diverse national and regional governmental approaches are studied, such as the legitimacy and transitional success in Canada and Germany (Gürtler et al., 2021), the dimensions of justice addressed in European countries (Schuster et al., 2023), and the unions' role in Australia (Snell, 2018).

At a more narrow level, scholars argue that there is a lack of localization of global and national decisions surrounding the transitional management. Although worker compensation and pension support could overcome short-term injustices, it is insufficient in rethinking communities that have long relied on fossil fuel production. Transitioning communities often face heavy emigration due to the lack of opportunities and economic stagnation following the closure of an energy production site (Schuster et al., 2023). This could be made more just, for example, by implementing place-based programs to repurpose large-scale infrastructure like mines, to bring new jobs to these communities (Cha & Pastor, 2022). In addition, communities have not only relied on fossil fuels for economic development but also for identity and connections. Therefore, while the global level sets the broad transitional guidelines and the national level can provide resources to fund state or regional efforts, scholars emphasize the importance of giving the local level the power to decide specific uses.

A Just Transition for Whom?

Regarding local communities' discretion to decide their best interests in a transition, scholars discuss a key question: "Who is a just transition for?". As discussed in Section 1.2.1, just transition has faced conceptual challenges by being an umbrella term for different dimensions of justice for different targets. For example, someone in a fossil fuel community has a different understanding of a just transition from someone living in a coastal region threatened by rising sea levels. Even when limiting the concept to a just energy transition for fossil fuel communities, scholars find the term and associated initiatives are fragmented and limited (Galgóczy, 2022). Through interviewing citizens living in fossil fuel communities, Cha and Pastor (2022, p. 3) find that the term itself is resisted, with some respondents calling it "a language made up by elites for elites to keep regular people out of the debate". This division could result in fossil fuel communities feeling resistance against just transition initiatives that are idealistic and do not consider their practical needs.

Optimists point out that the idea of just transition has served to advance conversations about how to balance the needs of a wide range of stakeholders when making climate policy decisions (Snell, 2018). In line with arguments that a transition does not create new injustices but instead brings to attention existing injustices, the transition goals could be seen as an opportunity that allows marginalized groups to voice their concerns and the broader public to acknowledge them. Separately, some criticize the over-fixation on technical aspects of the transition, causing a gap

between theory and practice that neglects sociocultural consequences (Schuster et al., 2023; Velicu & Barca, 2020). These studies show that we have much to discuss about “who is a just transition for?” and the definition will be decided specifically in each case.

Initiatives and Citizens

Some studies have examined how citizens perceive just transition initiatives and how they are affected by the initiatives. While the effects of just transition initiatives could be analyzed through macro calculations of industrial employment rates or by interviews and surveys, these studies are limited to preliminary findings. Qualitative studies are also limited by accessibility issues, as most studies reflect the views of political actors, trade union representatives, and non-governmental organization staff instead of ideal subjects like industry workers or citizens in fossil fuel communities. Some cases report, such as a study by Cha (2020), multiple requests for interviews were denied due to skepticism or fear of backlash from employers.

Still, interviewing local policy actors in fossil fuel regions, Mayer (2018) finds broad support by policy actors for just transition initiatives regarding worker retraining, relocation, and pension protection. Contrary to previous beliefs that political identity or partisan affiliation is one of the most significant predictors of support for just transition, these variables had a small effect and did not reach statistical significance. Furthermore, the policymakers were not influenced by community economic identity in supporting just transition initiatives. Although it may be the case that these findings are limited to political actors, the study indicates the possibility of building consensus beyond previously thought boundaries of climate change politics.

There are few studies that obtain data about citizens’ perceptions of just transition initiatives. In a novel approach to interviewing citizens at a county fair, Gazmararian (2024) finds that fossil fuel communities support several initiatives. Firstly, fossil fuel communities support policies targeting individuals to stay in their communities without relocating, like worker benefits and income compensation. Secondly, they are more likely to support climate policies that include “just” dimensions like healthcare, pension, and income compensation packages. Finally, the majority of fossil fuel community residents would support climate policy when combined with just transition assistance. While this study is limited to hypothetical questions about initiatives, it suggests that certain just transition initiatives could contribute to overcoming community resistance against climate policies.

Crowe and Li (2020) use a mail survey in some regions of the U.S. to examine the regional effect on support for renewable energy and just transition initiatives. They find that, regardless of place or political affiliation, respondents believe the government should strengthen their support for displaced coal workers and aid retraining in the solar industry. However, it also finds skepticism in fossil fuel communities toward initiatives, reinstating others' findings; residents from regions with an economic identity tied to fossil fuel sources, even if they did not work in the industry, were less receptive to renewable energy funding. This shows that citizens living in particular regions or having an identity tied to the fossil fuel industry may oppose certain transitional efforts, even when linked with just transition initiatives.

Reviewing studies about just transition initiatives shows that scholarly attention has previously focused on normative discussions and defining "just transition". The real-life implications of just transition initiatives and how they may overcome resistance to the transition have been limited to regional or hypothetical questionnaires. Crucially, studies focusing on citizens' attitudes have been limited due to accessibility barriers. Thus, this study aims to contribute to the literature by analyzing how implemented just transition initiatives influence nationwide individual attitudes toward climate policies. To understand what influences public opinion about climate policy, the next section will review studies about climate policy preferences to outline known determinants.

1.3. Citizens' Policy Preference

To analyze how just transition initiatives influence citizens' preferences for climate policy, it is necessary to refer to findings about determinants of public opinion on climate change. The first subsection will outline climate policies to understand how just transition initiatives relate to climate policies. Then, the second subsection will delineate known determinants of citizens' policy preferences on climate change.

1.3.1. Climate Policies

It is essential to understand how climate policies could be organized in relation to just transition initiatives to discuss what influences citizens' climate policy preferences. Furthermore, the categorization is important in exploring how just transition initiatives may influence policy preferences differently depending on the type of policy. Climate policies involve multilevel and multisectoral collaboration and have diversified in empirical examples over the years, making

them difficult to systematically categorize. Nevertheless, researchers have adopted various ways to group climate policies. Although not comprehensive, this section reviews studies that provide frameworks for climate policies to discuss how citizens support or oppose these policies.

Climate policies typically consist of two main strategies: mitigation and adaptation. Mitigation is an intervention to reduce greenhouse gas emissions, and adaptation is to prepare for potential harm that could be caused by climate change (Bréchet et al., 2013). Mitigation policy aims to reduce the negative outcomes of climate change through long-term efforts. While some have described mitigation policy as “a classic ‘tragedy of the commons’” with few reasons for governments to contribute, co-benefits like reduced air pollution and strengthened energy security have been argued (Kammerer & Namhata, 2018, p. 478). Contrarily, adaptation policy consists of relatively short-term activities that aim to minimize the harmful effects of climate change (Abbass et al., 2022).

Other than the main policy strategy, one could categorize the policies depending on the subject. In the context of the actors in climate politics involving the incumbent, challenger, and countermovement, the reaction may differ significantly depending on the policy subject. For example, approaches targeting the demand side would involve restricting activities of individuals or businesses, while supply-side policies would target the incumbent fossil fuel industries to make it difficult for them to emit greenhouse gases (Healy & Barry, 2017). Although policymakers are reluctant to apply supply-side policies, in part due to the incumbent’s lobbying efforts, scholars argue that it could be effective to see meaningful emission reduction. Furthermore, individuals have been found to be more accepting of supply-side policies than demand-side policies (Swim & Geiger, 2021).

As climate policy’s relevance increases, governments have experimented with various instruments, which scholars have then categorized for analytical purposes. For example, Hughes and Urpelainen (2015) categorize national-level energy-related climate policies by looking at how concentrated or dispersed the costs and benefits are, then distinguishing them between fiscal (taxes, credits, and direct subsidies) and regulatory (mandates, standards, and regulations) instruments. Specific instruments evaluated based on climate policy criteria, such as cost-effectiveness, distributional equity, minimization of risk in the presence of uncertainty, and political feasibility, could be useful in discussing the optimal approach (Goulder & Parry, 2008). Another approach is

to organize policies depending on a matrix consisting of the policy's scope (limited to monetary or broader) and orientation (backward-looking or forward-looking). This accommodates non-monetary instruments by acknowledging a wide range of policy types from adjusting new market conditions to allowing legal exemption from climate change laws (Fergus, 2018).

A categorization by Dwarkasing (2023) divides climate policies into reactive or proactive, depending on the policy tool's purpose and impact on communities. Proactive policies are those that aim to increase the usage of renewable energies to change the current energy system. Reactive policies aim to reduce carbon emissions to mitigate the effects of climate change. Relating this categorization to justice, proactive policies use tools like subsidies that could lead to injustices related to renewable energy development (e.g., windmills built in close proximity to a community, creating negative outcomes like decreased green areas). Contrarily, reactive policies use tools like taxes, leading to the unjust outcome of lost opportunities, such as mine closures and industry shrinkage. In other words, proactive policies create a new (in some cases, unwanted) asset, while reactive policies take away an existing asset in a community. This categorization is the most relevant to this study, as it is specific to the energy transition and applicable in analyzing the policies' relation to justice in communities.

1.3.2. Determinants of Citizens' Policy Preference

Following the categorization of climate policies, this section will discuss what shapes public preferences toward climate policies. This is crucial, as citizen support can determine the political feasibility and long-term success of mitigation and adaptation measures. Prior research has identified a range of factors, including individual beliefs, socio-economic conditions, political influences, and broader structural contexts, that influence whether individuals support or oppose climate action. This section reviews these determinants, with a particular attention to how just transition initiatives may shape public attitudes toward climate policies.

Individual-level Determinants

At the individual level, citizens' climate policy preferences are shaped by their knowledge and values. Research suggests that people may need fundamental knowledge about climate change to support policies (Pearson et al., 2017; Rode et al., 2021). For example, people may need to know initial facts about climate change (e.g., burning fossil fuels contributes to climate change) and

connect policies to these facts (e.g., imposing taxes on fossil fuel sources to limit combustion). One study finds that educational videos about policy mechanisms increase support for climate policies, corroborating that the lack of knowledge could lead to less support (Dechezleprêtre et al., 2024). People may be less likely to support policies without prior knowledge because policy changes imply costs and changes to their current lifestyle.

As for personal values, an American study in 2006 found value commitments to be a stronger predictor of climate policy support than political party identification (Leiserowitz, 2006). People's support for climate policies was strongly associated with pro-egalitarian values, which were measured by the level of agreement with statements unrelated to climate change. Contrarily, people with anti-egalitarian, pro-individualistic, and pro-hierarchist values were less likely to support climate policies. Another individual-level factor is the personal pain suggested by the policy through the incentive structure: climate policies motivating people through rewards are preferred over punishments (Swim & Geiger, 2021). These findings suggest that climate policy could be influenced by prior knowledge, preexisting values, and perceived personal hardships caused by the policy.

Socio-Economic Determinants

Besides the individual's knowledge of climate change and personal values, scholars have identified several socio-economic determinants of climate change support. Sociodemographic factors like race, gender, income, and age are inconclusive depending on the study, although some connections have been made. For example, surveys find that Blacks and Latinos express higher support for national and international climate and energy policies than Whites, and men are more likely to support the preservation of the status quo (Mayer, 2018; Pearson et al., 2017). Social class, measured through income and education level, also plays a role because it influences vulnerability to climate change and risk perception, and it interacts with other factors to amplify the effects (Pearson et al., 2017). For instance, highly educated Republicans are more likely to believe the effects of climate change are exaggerated than less educated Republicans.

When controlling for these demographics and party identification, scholars find an association between where a person lives and their attitudes toward climate policy. Those living in urban and suburban areas are more supportive of climate action than those in rural areas (Diamond et al., 2020). However, while studies find that residents in rural areas generally hold negative attitudes

toward renewable energy development, those living closer to power plants have more positive attitudes toward policies that reduce pollution from power plants, invest in disaster resilience, and support vehicle efficiency (Diamond et al., 2020; Olson-Hazboun, 2018). Additionally, when climate policies are framed as efforts to help farmers and future generations, policy support increases for those in rural neighborhoods, especially among women (Diamond et al., 2020). Another aspect is a general existence of both not-in-my-backyard and yes-in-my-backyard sentiments: Studies find that one is more likely to support climate policies believed to benefit one's region, and vice versa (Svenningsen & Thorsen, 2020).

Beyond the geographical categorization, a community's local context, particularly economic conditions and ties to high-carbon industries, has been considered an important variable. For example, communities with weak economies are more likely to embrace potentially harmful industries because they could provide economic opportunities, and oppose the transition away from fossil fuel resources (Cha, 2020; Mayer, 2018). Similarly, communities with higher unemployment rates were less likely to support an energy transition (Wang & Lo, 2021). As for the relation to renewable energy development, studies find that those living in fossil fuel communities have negative attitudes toward investing in renewable energy in their communities because they feel that "coal was unjustly 'under attack'" (Olson-Hazboun, 2018, p. 371), and those living near wind turbines are less likely to support climate policies (Wang & Lo, 2021). Upon these findings, scholars suggest that a community's culture, history, and memory play an important role in climate change politics and should be carefully considered (Crowe & Li, 2020).

Political Determinants

With the increased politicization of climate change, several political determinants influencing policy support are documented. Environmental attitudes have a strong association with political ideology. Growing ideological and partisan polarization on climate change is found in several studies, with liberals holding positions close to the scientific consensus and conservatives less so (Dunlap et al., 2016; Falkenberg et al., 2022; McCright & Dunlap, 2011). This has been attributed to the conservatives' historical preferences for low state intervention, the general trend of polarization in the United States, and the media's role in amplifying non-scientific voices (Brulle, 2020; Chinn et al., 2020). In a broader sense, climate policy preferences are known to be influenced by how citizen sees the government. For example, several studies demonstrate the influence of

trust in the national government and its competence to address climate change on climate policy attitudes (Kitt et al., 2021; Kulin & Johansson Sevä, 2021).

Other than party affiliation and trust in the government, Wang & Lo (2021) argue that fairness could play a significant role in gaining public support for climate policies. As for distributive fairness, studies have found that climate policies with a progressive distribution of costs and benefits (i.e., richer societal members bearing a larger cost and poorer societal members receiving a larger benefit) receive more support (Drews & Van Den Bergh, 2016, p. 862). Procedural fairness is often highlighted by just transition scholars, such as a comparative study of energy transitions in Denmark and Germany, demonstrating that perceived procedural fairness increases perceived legitimacy of outcomes, especially when social and environmental compensations are considered (Mundaca et al., 2018). Additionally, a meta-analysis that synthesized 89 datasets about climate policy preference determinants found stronger evidence for perceived fairness over trust, values, and demographic factors (Bergquist et al., 2022). The strong effect found for fairness on policy support suggests that citizens are more likely to support climate policies when they are packaged with distributive initiatives towards those adversely affected by the policies. Similarly, Swim and Geiger (2021) find that social and economic impacts of the policies influence attitudes, arguing that the policy outcome should be communicated effectively to minimize resistance.

While previous research has examined economic, ideological, and political determinants of climate policy preferences, less attention has been paid to the role of just transition initiatives in shaping climate policy support. Given that these initiatives aim to overcome grievances caused by decarbonization, they may play a role in increasing acceptance of climate change strategies. The next section develops hypotheses based on these findings to examine whether and how just transition initiatives influence citizen attitudes toward climate policies.

1.4. Hypotheses

This chapter has discussed relevant literature to my research question: “How do just transition initiatives influence citizens’ preferences for climate policy?” Upon examining the development of an intense power struggle in climate change politics, it is of high interest whether just transition initiatives are effective as a counter-strategy to overcome citizens’ resistance to climate policy. Particularly, communities experiencing hardships in a transition (i.e., those with economic or cultural ties to fossil fuel industries) are likely to be susceptible to a countermovement mobilization

by the incumbents. As various just transition initiatives target these communities, examining the initiatives' effects on climate policy support is relevant for the field.

Empirical and conceptual studies on just transitions have suggested that, while there are multifaceted factors that influence citizens' support for climate policy, perceived fairness of a transition could influence support for climate policies (Bergquist et al., 2022; Gazmararian, 2024; Mundaca et al., 2018; Wang & Lo, 2021). Drawing on these findings, I hypothesize that just transition initiatives that highlight justice for communities affected by the transition positively influence citizens' climate policy support. Furthermore, the higher the level of funding in a region, the higher the policy support should increase. In addition, whether and to what extent the type of climate policy matters will be explored. Building on studies that suggest citizens' preference change depending on the type of climate policy (Svenningsen & Thorsen, 2020; Swim & Geiger, 2021), I hypothesize that support for proactive policies, which create new assets (e.g., renewable energy) in communities, are more likely to change in reaction to just transition initiatives, than support for reactive policies, which remove existing assets (e.g., fossil fuel energy) in communities. The following chapter will present the research design in which these hypotheses will be examined.

2. Research Design, Data, and Methodology

Following the literature review and my hypotheses regarding how just transition initiatives influence citizens' climate policy preferences, I will present my study's research design, data, and methodology. In this section, I will explain why the United States is a suitable case for my study, the operationalization and data sources for the independent and dependent variables, and the specific analysis method I use. Finally, I discuss the limitations of my research design.

2.1. Case Selection: The United States and Regional Contexts

Testing the hypotheses about how just transition initiatives influence climate policy preferences requires a case that has three conditions. Firstly, policies to support the transition from fossil fuel energy sources should exist. This could include the government actively transitioning away from fossil fuels for a greener energy mix or the government acknowledging the community's decline and supporting the transition. Secondly, a clear regional division between fossil fuel and non-fossil fuel communities should exist. The regional division is necessary for the analysis because the initiatives are expected to be non-uniform (i.e., only those in fossil fuel communities receive benefits). Thirdly, climate change should be a politicized and polarized issue. For just transition initiatives to have a measurable impact on citizens' climate policy preferences, climate change must be a salient issue. If climate change were a broadly accepted and non-partisan concern, individuals' policy preferences would likely be shaped by general economic or social considerations rather than ideological or political divides. However, when climate change is politicized, citizens are more likely to develop policy preferences based on their partisan identities and regional economic interests. This polarization also increases the likelihood that just transition initiatives influence attitudes differently across groups, as those in fossil fuel-reliant regions may view such policies as either necessary compensation or unfair government intervention, depending on their political alignment.

The U.S. is a suitable case fitting these three conditions: there are national just transition initiatives targeting fossil fuel communities, a clear territorial division between regions that have heavily relied on fossil fuel production and those that have not, and climate change is a highly politicized and partisan issue. The U.S. stands out due to the high degree of partisan polarization on climate change, making it an ideal context to examine how just transition initiatives interact with existing

worked to weaken environmental protection policies, while Democrat presidencies (Clinton, Obama, and Biden) have strived to protect implemented policies but have been unable to pass new ones, impeding climate and environmental legislation (Carter, 2018). Illustrating this back-and-forth is the international treaty Paris Agreement, with the U.S. joining in 2015 under a Democrat majority, withdrawing in 2017 under a Republican majority, being readmitted in 2021 under a Democrat majority, and then re-withdrawing in 2025 under a Republican Majority. Domestically, the funding of the Environmental Protection Agency and the restructuring of the Clean Power Plan have been the focus of partisan reversal, similar to the Paris Agreement (Carter, 2018).

Some connect the polarization to politicians' recent trend of populist behaviors. Provoking climate skepticism contributes to the narrative of anti-elitism, which politicians can use to their advantage (Huber et al., 2020). Another points out the role of media through a study that finds newspapers have increasingly become polarized and politicized regarding climate change (Chinn et al., 2020). These factors combined have resulted in a highly politicized and partisan divide over climate change. Overall, while countries have varying regional contexts, the implementation status of just transition initiatives and extreme conditions of climate change politicization in the U.S. allow for the testing of whether or not just transition initiatives have an effect on citizens' preferences for climate policy, even with strong underlying political ideologies.

2.2. Independent Variable: Just Transition Initiatives

Stemming from the case selection, the first variable to discuss is the independent variable: just transition initiatives. Upon reviewing initiatives implemented in the U.S., two initiatives are selected to be combined as a single variable. Additionally, this section analyzes the types of justice addressed through the selected initiatives, following the discussion in section 1.2.1.

2.2.1. Initiative Selection

To test whether just transition initiatives influence citizens' policy preferences, I use the level of funding provided through just transition initiatives as an independent variable. For the analysis, this variable is aggregated into a regional categorical variable based on the funding per 1,000 inhabitants, which will be explained in further detail in section 2.4. Upon selecting initiatives that qualify as just transition initiatives, several steps were taken. The entirety of initiatives were identified using the keywords "just transition", "green transition", "fossil fuel", "energy

production”, and “energy community” through a governmental website (Congress.gov) and web searches. The search resulted in eight national initiatives, which were then narrowed down using the following criteria.

First, an initiative was eliminated if its target and purpose did not align with this study’s definition of just transition (i.e., a transition away from fossil fuel energy sources, which ensures a fair outcome for communities with strong economic ties to the fossil fuel industry). This step eliminated the Workforce Opportunity for Rural Communities (WORC) initiative. Although this initiative’s target to support economic recovery in rural regions overlaps with just transitional efforts, it does not specifically target fossil fuel communities, eliminating it from the initiative list.

Second, initiatives that did not match the temporal scope of this study were removed. Due to data availability of the dependent variable, described below in Section 2.3, the initiative implementation period was limited to those that began after 2008 and before 2019. This step eliminated the 2021 Coal Communities Commitment in the American Rescue Plan Act (ARPA), the 2021 Interagency Working Group (IWG) activities on Coal and Power Plant Communities and Economic Revitalization, and the American Miners Act extending from a 1974 pension plan for mine workers.

Third, the National Dislocated Worker Grants (NDWG) initiative was excluded because it provided funding to only three cases that align with the definition of just transition. Including such a narrowly targeted initiative to generalize about citizens’ attitudes at the regional unit would risk misinterpretation. Finally, the multistakeholder coalition Building Resilient Economies in Coal Communities Initiative (BRECC) was eliminated due to its focus on capacity-building projects without a quantifiable outcome. This study’s research design required measurable policy outcomes, such as funding amount or number of awards, which made BRECC unsuitable. The selected initiatives are the Partnerships for Opportunity and Workforce and Economic Revitalization (POWER) and Abandoned Mine Land Economic Revitalization (AMLER), each described below and summarized in Table 1.

Partnerships for Opportunity and Workforce and Economic Revitalization (POWER)

The Partnerships for Opportunity and Workforce and Economic Revitalization (POWER) was established by the Obama Administration as a multi-agency federal effort to assist communities hurt by declines in coal mining and coal-fired electricity generation. The largest agency that

administered the POWER initiative is the Appalachian Regional Commission (ARC), followed by the Economic Development Administration (EDA). According to a report by the Library of Congress, funds awarded by ARC through POWER amount to 488 million dollars (Lawhorn, 2024). While an official interagency evaluation has not been conducted, the ARC reports that for its part, the investments are projected to create or retain nearly 54,000 jobs, leverage more than 1.85 billion in private investment, and prepare nearly 170,000 workers and students for new sectors (Appalachian Regional Commission, n.d.).

However, official information with the full list of awards (including those by the EDA) and per-state funding amount is unavailable. Therefore, this study refers to a funding per state compilation data by Shelton et al. (2022, p. 16), which finds that POWER provided 410 million dollars through 484 grants awarded across 200 counties in 30 states between 2015 and 2020. Despite the POWER initiative's clear framing as a just transition initiative, the report suggests that some of the funds may have been misdirected to non-coal communities, according to original categorizations. Still, this study includes all recipients based on the initiative's purpose, which is clearly aligned with just transitional efforts.

Abandoned Mine Land Economic Revitalization (AMLER)

The Abandoned Mine Land Economic Revitalization (AMLER) program has implemented strategies since 2016 that return legacy coal mining sites to productive uses through economic and community development. AMLER supports local investment opportunities that provide for sustainable long-term rehabilitation of coalfield economies in the states and tribes of Alabama, Kentucky, Ohio, Pennsylvania, Virginia, West Virginia, Crow Tribe (Montana), Hopi Tribe (Arizona), and Navajo Nation (Arizona, New Mexico, and Utah). There have been nine rounds of funding between 2016 and 2024, and the amount of funding per region used in this study refers to the U.S. Department of the Interior Office of Surface Mining Reclamation and Enforcement website. The funding amount up to 2020 is included in this study to align with the data availability of POWER. For my analysis, I add each tribe's amount to the state where their geographical location exists. Although the Navajo Nation territory overlaps multiple states, they are in the same regional category used in my analysis (see section 2.4.2 for regional classifications). Therefore, funding received by the Crow Tribe, Hopi Tribe, and Navajo Nation is added to Montana, Arizona, and Arizona, respectively.

Table 1. *Just Transition Initiatives*

Year	Initiative	Description	Total Amount	Type of justice			
				Distributive	Procedural	Recognition	Restorative
2015 to 2020	Partnerships for Opportunity and Workforce and Economic Revitalization (POWER)	Assists communities hurt by declines in coal mining and coal-fired electric generation.	409,732,926	X			X
2016 to 2020	Abandoned Mine Land Economic Revitalization (AMLER)	Implements strategies to return legacy coal mining sites to productive uses.	539,970,000	X		X	X

Note. The AMLER initiative has continued into the 2024 fiscal year (U.S. Department of the Interior, n.d.). The POWER initiative, as of 2024, continues as a program funded by the Appalachian Regional Commission (Lawhorn, 2024). Both initiatives' funding amounts have been filtered to those between 2015 and 2020.

2.2.2. *Types of Justice*

As discussed in Section 1.2.1, scholars have categorized justice for analytical purposes. The four types of justice typically addressed in a just transition are distributive, procedural, recognition, and restorative. Although they have overlapping qualities that are not mutually exclusive, the categorization is useful to understand what type of injustices the initiatives aim to solve. Both initiatives have an inherent quality of distributive justice, as they are governmental actions using public funds. However, the initiatives are not examples of direct resource distribution in which individuals receive stipends or pensions. In both cases, the federal funds are distributed to states, municipalities, or smaller units of jurisdiction, sometimes through agencies, which are then used

to fund programs like skill training or business development. The initiatives qualify as distributive justice solutions for redistributing taxpayer money, thus distributing the responsibility of the energy transition.

Neither of the selected initiatives qualifies as a procedural justice solution, mostly due to the mismatch between the qualitative element of procedural justice and my initiative selection process, which focused on measurable outcomes. It should be noted that federal and regional just transition initiatives that heavily focus on procedural justice exist, such as the Building Resilient Economies in Coal Communities initiative (BRECC), which is not included in this study (see section 2.2.1. for the initiative selection process).

The only initiative that includes an element of recognition justice, which centers around deciding the boundaries of who is adversely affected by a transition, is AMLER. While both initiatives target the fossil fuel energy sector, POWER is funded based on application and competitive selection. Competitiveness is iterated through its guidelines, leaving applicants to define themselves as deserving of the fund: the EDA states there is “no pre-defined eligibility list of impacted coal communities”, and an application is allowed as long as they can demonstrate their community is experiencing job losses and layoffs in fossil fuel production or related industries (Economic Development Administration, n.d.). Conversely, the AMLER funding process is guided by the decision to support pre-determined priority states and tribes stipulated in the Surface Mining Control and Reclamation Act of 1977. Although there is an application-based selection process within each state and tribe, the federal government defines the initial distribution, making it a recognition justice solution that acknowledges and defines those adversely affected by the transition.

Finally, my study identifies restorative justice solutions as initiatives emphasizing injustices caused by neglected past transitional activities. Both POWER and AMLER are examples of initiatives addressing restorative justice. POWER aims for restorative justice by providing funds for “communities who have historically relied on the coal economy for good jobs and economic prosperity”, which have decreased with the transition (Economic Development Administration, n.d.). As for AMLER, the guidelines state that the program will “return impacted areas to productive reuse [...] to achieve the economic and community development goals”, addressing the negative consequences in communities left with damaged land from energy extraction

(Department of the Interior, 2023). Together, the two initiatives addressing distributive, recognition, and restorative justice will be examined to see how their implementations have influenced citizens' climate policy preferences.

2.3. Dependent Variable: Citizens' Policy Preferences

The second variable to discuss is the dependent variable: citizens' policy preferences on climate policies. To test whether the initiatives influence citizens' preferences, I use nationally representative survey data, Climate Change in the American Mind (CCAM), by the Yale Program on Climate Change and Communication and the George Mason University Center for Climate Change Communication. As of April 2025, CCAM includes 29 waves from 2008 to 2023 that draw on a representative sample of U.S. adults aged 18 and older. This dataset includes measures of policy preferences, as summarized in Table 2, and relevant individual variables such as political views and socio-demographic information like gender, age, education, and income.

CCAM asks a respondent, "How much do you support or oppose the following policies?" regarding four climate policies (Ballew et al., 2020). The first is "Regulate carbon dioxide (the primary greenhouse gas) as a pollutant". Carbon dioxide (CO₂) is released into the atmosphere mostly through burning fossil fuels for energy. Fossil fuels like coal and oil store carbon that has been removed from the atmosphere over millions of years, and the carbon is released back into the atmosphere when these fuels are burned. CO₂ is an issue for climate change because it adds to the Earth's greenhouse effect, causing the temperature to rise (Lindsey, 2024). While the U.S. has moved towards regulating CO₂ emissions from vehicles and power plants since the 2000s, the recent Trump administrations have weakened or replaced these decisions. Regulating CO₂ could add costs to fossil fuel production, leading to higher energy prices.

The second is "Set strict carbon dioxide emission limits on existing coal-fired power plants to reduce global warming and improve public health. Power plants would have to reduce their emissions and/or invest in renewable energy and energy efficiency. The cost of electricity to consumers and companies would likely increase". This policy is similar to the first but limits the scope to power plants using coal, the most carbon-intensive fuel (Gillingham, 2019). In addition to the carbon emissions, the policy statement introduces the public health aspect. According to the National Institutes of Health, air pollution from coal-burning power plants contains toxic pollutants like PM_{2.5}, which is associated with deaths for workers and residents (National Institutes of Health,

2023). The policy statement asks if the respondent will pay extra costs to restrict coal-fired power plants.

Table 2. *Policy Variable Description*

Policy variable	Description	Policy type
CO2	Regulate carbon dioxide (the primary greenhouse gas) as a pollutant.	Reactive
Coal	Set strict carbon dioxide emission limits on existing coal-fired power plants to reduce global warming and improve public health. Power plants would have to reduce their emissions and/or invest in renewable energy and energy efficiency. The cost of electricity to consumers and companies would likely increase.	Reactive
Energy Mix	Require electric utilities to produce at least 20% of their electricity from wind, solar, or other renewable energy sources, even if it costs the average household an extra \$100 a year.	Proactive
Research	Fund more research into renewable energy sources, such as solar and wind power.	Proactive

Source. Ballew et al., 2020.

The third questionnaire is “Require electric utilities to produce at least 20% of their electricity from wind, solar, or other renewable energy sources, even if it costs the average household an extra \$100 a year”. This policy asks about the respondent’s support for increasing renewable energy without relating it to any potential drawbacks like climate change or public health. While the policy targets the supply-side utility companies, it mentions the demand-side individual’s additional cost as 100 dollars per year, which helps the respondent imagine the personal consequences of supporting the policy.

The fourth is “Fund more research into renewable energy sources, such as solar and wind power”. The willingness to support this policy could be multifaceted, as the respondent likely has to have faith in renewable energy technology, but also in government-sponsored knowledge production. One study showed that trust in science declined among American Conservatives between 1974 and 2010, which is in accordance with the trend of Conservatives and Republicans denying climate change (Gauchat, 2012). For these combined political layers, the responses to this policy may be difficult to interpret.

Referring to the types of climate policies, as discussed in Section 1.3.1, the four policies analyzed in this study can be divided into reactive and proactive depending on the aimed outcome of each policy. The CO₂ and Coal policy variables exemplify reactive policies, as they aim to take away an existing asset in a community, like power plants. The Energy Mix and Research policy variables represent proactive policies, as they aim to add a new asset to the community, like renewable energy facilities. Following my hypothesis about policy type, I expect just transition initiatives to influence preferences for the Energy Mix and Research policy variables more than the CO₂ and Coal policy variables.

2.4. Methodology

Using the two variables discussed above, I explore my research question by distinguishing between U.S. regions targeted and not targeted by federal just transition initiatives, and then analyzing the change in each region’s citizens’ policy preferences over time. Specifically, I create a three-category variable that represents the level of funding received in each region, as low, medium, and high. I examine this variable’s effect on individual policy preference variables over two time periods to test whether there is a meaningful shift in attitudes in relation to the initiative funding amount. This section describes the methodology and the process of organizing the data for analysis.

2.4.1. Time Measurement

For my dependent variable, citizens’ policy preferences, I utilize CCAM’s survey data across two time periods to examine the effect of the initiatives: before and after the initiative implementation. There is a dilemma in deciding when to measure the effects because they are expected to occur gradually over many years. It is unlikely that citizens will immediately recognize the benefits of the funds and change their policy preferences. However, measuring the effect long after the

initiative implementation makes it more difficult to attribute the effect to the initiative, as many more factors influencing citizens’ preferences will be included in the period. Especially with the rapidly changing political landscape surrounding climate policy, the risk of extending the period outweighs the risk of being unable to measure the initiative’s full effect.

Therefore, I compare citizens’ preferences from two time periods. The “before” measurement is taken from 2014, one year before the POWER initiative was introduced. The “after” measurement is taken from 2020 and 2021 considering two factors: First, as the questionnaire used in the CCAM dataset varies in each wave, the most recent wave measuring the relevant policy variables is in 2020 (for the Energy Mix variable) and 2021 (for the CO2, Research, and Coal variables). Second, regionally categorizable funding information for the POWER initiative is available up to 2020 (Shelton et al., 2022). While the initiatives are still ongoing in 2024 (with POWER being solely administered by a regional agency and AMLER continuing at the same capacity), I filter the funding amount up to 2020 to match the time measurement. Table 3 summarizes the measurement timing in relation to the initiative implementation.

Table 3. *Measurement Timing for Each Policy Variable*

Policy Variable	2014	2015	2016	2020	2021
		POWER implemented	AMLER implemented		
Energy Mix	T1			T2	
CO2	T1				T2
Research	T1				T2
Coal	T1				T2

Note. T1: Before-measurement, T2: after-measurement.

2.4.2. Regional Measurement

The CCAM dataset categorizes respondents into nine U.S. Census Bureau regions rather than all states due to statistical and methodological considerations. Given the limited sample size, disaggregating responses at the state level would lead to a small number of responses per state and high margins of error, particularly for less populous states, reducing the reliability of estimates. By grouping the responses into larger regional categories, the survey aims to improve statistical robustness and ensure a geographically representative analysis of public opinion on climate change. This approach aligns with standard survey methodology, where regional classifications help maintain analytical clarity and interpretability while ensuring sufficient statistical comparisons (Ballew et al., 2020).

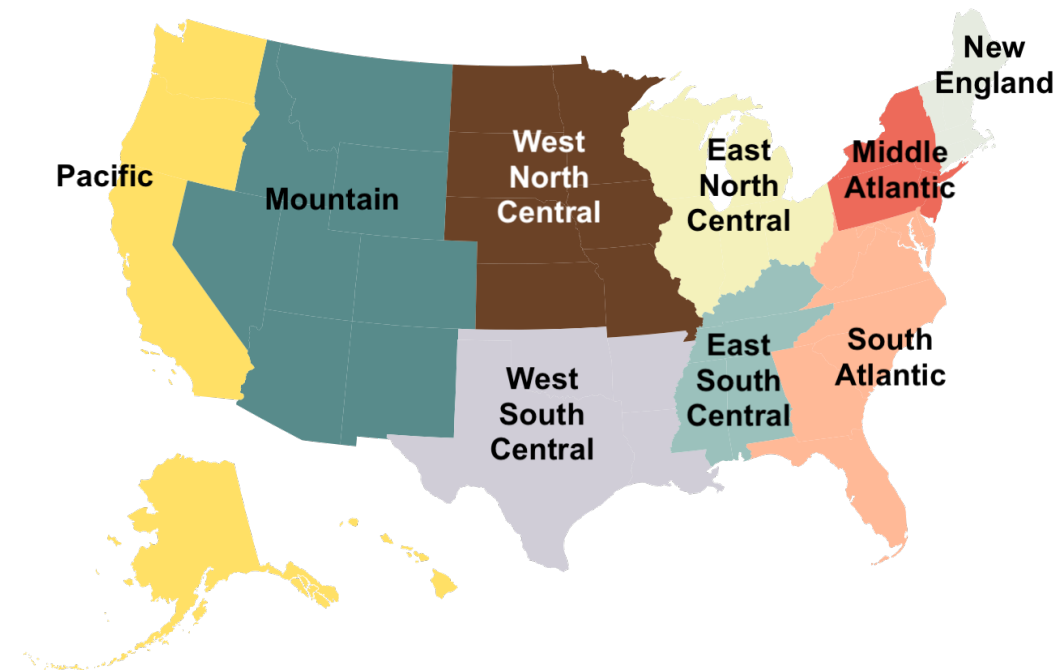


Figure 2. *The Nine U.S. Census Bureau Regions*

For my independent variable (just transition initiative funding level), I follow the survey’s regional groupings to aggregate the funds received per state into a per-region amount. As the nine regions include states with various population sizes, I divide the funding amount by the aggregated

population size to calculate the funding amount per 1,000 inhabitants. Then, based on the trend among regions, I manually code a categorical variable to represent the level of funding per 1,000 inhabitants received in each region in comparison to other regions, as low, medium, and high. The precise amount received per region and the manually coded categorical variable are in Appendix A, and Figure 3 shows the categories across the regions. The highest level of funding is received by the Middle Atlantic, South Atlantic, and East South Central regions. The East North Central and Mountain regions receive a medium level of funding, and the New England, Pacific, West North Central, and West South Central regions receive a low level of funding.

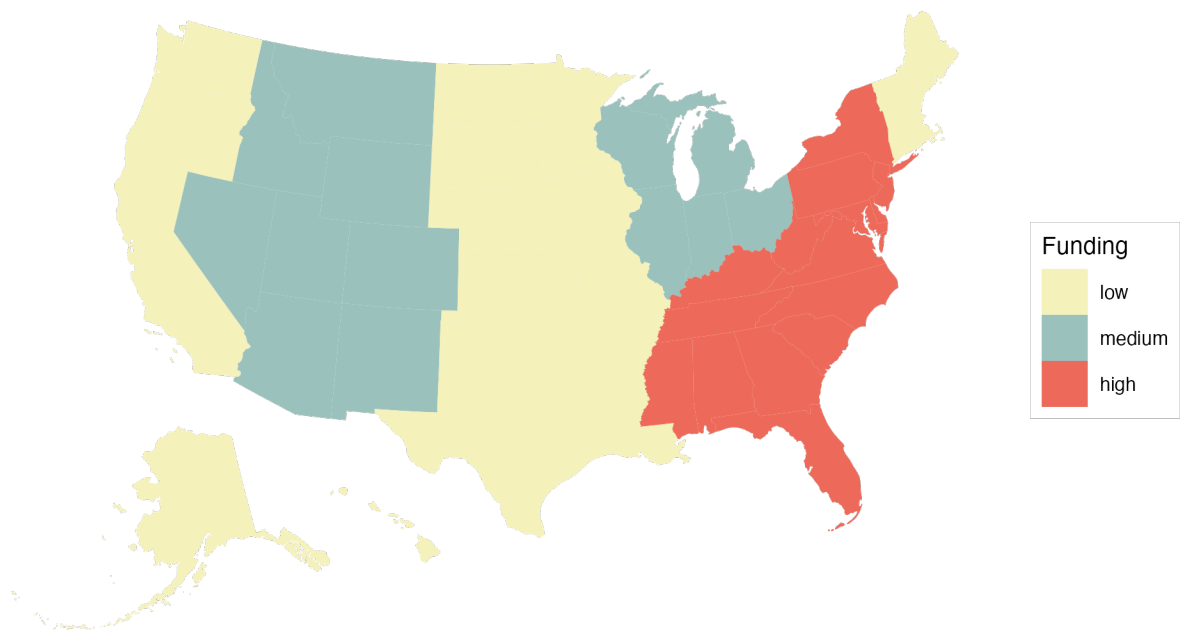


Figure 3. *Regional Just Initiative Funding Level*

2.4.3. Individual Survey Data

To analyze the individual survey data, I recode CCAM’s survey data about citizens’ preferences from a four-category variable to a binary variable. This is done because my research is interested in distinguishing support and opposition to climate policy, rather than the intensity of the support. The binary variable aligns with the focus of this research while improving the interpretability of

the results. Responses with “1: strongly oppose” and “2: somewhat oppose” are recoded to “0: oppose”, and responses with “4: strongly support” and “3: somewhat support” are recoded to “1: support”. Those who refused to answer questions related to policy preferences were removed from the analysis.

To control for known sociodemographic variables to influence climate policy preference, as discussed in Section 1.3.2, I include gender, education level, income level, and party identification as control variables in each model. While the CCAM dataset offers sampling weights based on key demographic variables to match the U.S. Census Bureau norms, this analysis does not use the sampling weights, as the dataset recommends using weights for descriptive analyses (Ballew et al., 2020).

2.4.4. Analyzing the Effects

Aligning with this thesis’s goal to examine whether and how just transition initiatives might influence citizens’ preferences regarding climate policies, this section will discuss the specific method used to analyze the effects. The aim is to explore whether just transition initiatives may be associated with changes in citizens’ policy preferences in a way that suggests potential causal mechanisms. However, referring to discussions about causality in social sciences, this thesis does not claim to identify causality in a strict statistical sense (Brady, 2011). Instead, it focuses on identifying observable patterns, while considering temporal precedence (i.e., initiatives must occur before changes in preference), statistically controlling for confounding variables (e.g., sociodemographics, partisanship), and drawing on theory-informed expectations as outlined in the first chapter. The results should not be interpreted as proof of causality, but rather as exploratory evidence to guide further research.

I prepare the data for analysis by distinguishing between U.S. regions with varying levels of initiative funding, as described in Section 2.4.2. Then, I categorize individual survey responses (i.e., policy preferences) to follow these regional categories based on the individual’s state of residence. Figure 4 illustrates the logic of what I expect from the analysis. In this example, the policy support appears to vary depending on whether the region was targeted or not, with targeted regions having a lower level of support than other regions before the initiative is implemented. If there is no effect of the initiative, one would expect the trend in support, controlling for anything else, to be the same in targeted and non-targeted regions. If there is a difference between the regions,

one would expect the trend to be more positive in the targeted regions. In other words, the policy support change (measured as after [T2] minus before [T1]) for targeted regions minus policy support change for non-targeted regions should be positive and statistically significant.

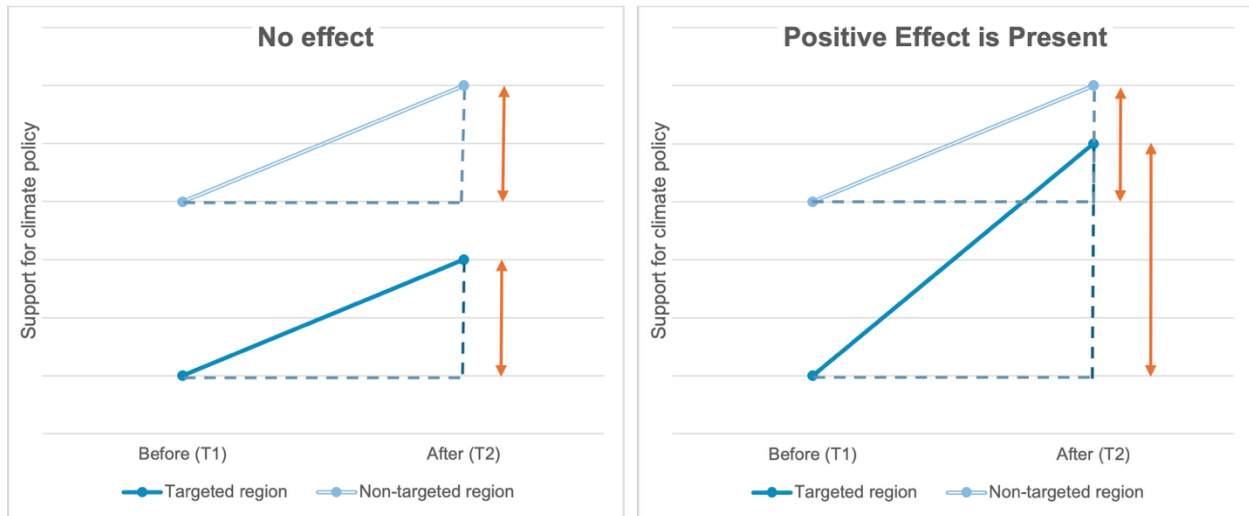


Figure 4. *Expected Effect by Comparing Differences Across Regions and Times*

I create four models for each of the four policy variables and use two steps to test this expectation. For the first step of the analysis, I conduct a logistic regression analysis using the regional funding level (independent variable) and the policy preference (dependent variable). To examine the temporal change in policy preferences, the time period (the year in which survey responses were collected) is included as an interaction term. This step allows the assessment of the overall association between the regional funding level and policy support, and whether this association varies for each time period. However, these results only indicate a general relationship and do not specifically test whether policy support significantly changed depending on the regional and temporal aspects.

Therefore, I use a second step to compare the policy support change for targeted regions and the policy support change for non-targeted regions. This is done by a comparison between the likelihood of citizens' policy support calculated in the first step. To use the illustrative example from above, this step calculates the difference between the orange arrows, which represent the policy support change (T2 minus T1) for targeted regions and non-targeted regions. To find a

pattern suggesting that citizens' policy support was different in targeted regions (i.e., receiving just transition initiative funds), compared to non-targeted regions (i.e., not receiving funds), the results should be positive and statistically significant.

This step is necessary because it takes into account the change that is present in all regions, which cannot be attributed to the initiative funding. For example, in the “no effect” example in Figure 4, both regions experience a support increase. However, the level of increase is the same, suggesting there was a cause unrelated to the initiative funds. Only if the support change is different between the regions as evident in the “positive effect is present” example, will the results suggest a possibility that attitudes may relate to the regional categorization of just transition initiatives.

2.5. Methodological Limitations

Before presenting the analysis results, I will discuss four limitations that constrain the findings of this study. The first limitation is the regional aggregation. While the survey aims to improve robustness through regional aggregation due to the limited sample size, it creates complications for my study because the initiatives are generally conducted at the state level or narrower. The nine regions used in the survey are geographical census categories and do not separate the states based on their reliance on fossil fuel industries. As a result, some regions include states that are heavily targeted by just transition initiatives and states that are not, introducing potential measurement errors due to intra-regional heterogeneity.

The second limitation is the timing for measuring the policy effect. As discussed in Section 2.4.1, the effects of a policy are expected to unfold over many years. This analysis examines the effects of six to seven years between 2014 and 2020-2021. It should be noted that the initiatives are ongoing, and different effects could occur in the future. While the narrow timing could contribute to more concrete results by isolating particular effects, it also limits my findings by not capturing the whole picture of the initiatives' effects. Additionally, this study does not directly measure public awareness of each initiative, making it unclear whether citizens are exposed to and understand the just transition initiatives after implementation. Therefore, there are limitations in attributing changes in policy preferences, and the results should be interpreted with caution.

Similarly, this study measures how citizens' preferences change, which should be distinguished from behavioral change. As (Schuman & Johnson, 1976, pp. 163–165) noted, empirical social

research must be cautious of the “attitude-behavior (A-B) problem”, which is the gap between attitudes and actual actions. In other words, just because one responds in a survey that they support a climate policy, it does not mean they will take political action (e.g., vote for a representative based on that view, join a climate protest, sign a petition, etc.). Still, while the survey responses should not be interpreted as behavioral implications, they could become important factors that represent public demand and influence future policymaking.

The final limitation is the initiative level. Although this study only analyzes initiatives implemented by the U.S. federal government, there are several state and region-led initiatives that possibly influence citizens’ attitudes toward the transition and climate policies. For example, the states of Colorado and New Mexico have passed legislation targeted at transition management (Piotrowski & McBee, 2021). In addition to the geographical level, non-governmental initiatives are also not included in this study. A core example of non-governmental initiatives in the U.S. is the Just Transition Alliance, a workers’ union advocating for economic and environmental justice initiatives among other issues (Just Transition Alliance, n.d.). Limiting the level to governmental initiatives at the national level could overlook the effects caused by initiatives at other levels.

3. Results

This chapter presents the results from empirically testing this study's hypotheses and discusses the results' interpretations. I begin by presenting the descriptive results and the statistical analysis results for each policy variable. Then, I will discuss the interpretations of the results by relating them to the broader literature, as described in earlier chapters. The full results of the statistical analyses are included in Appendices B and C. The models were run in R version 4.4.3 with the `glm` and `emmeans` functions.

3.1. Descriptive Results

The analysis used the Climate Change in the American Mind (CCAM) dataset, which draws on a representative sample of U.S. adults aged 18 and older. The May 2024 dataset included a total of 33,265 observations, with 830 to 2,164 observations per wave. After selecting the time period of interest (2014, 2020, and 2021) and cleaning missing data, the final dataset used for the analysis included 2,992 observations.

The independent variable, just transition initiative funds, combined two initiatives: competitive grants for communities hurt by declines in the coal industry (POWER), and funds to support local investments to rehabilitate legacy coal mining sites (AMLER). To create the variable, the nine U.S. regions were sorted into three categories based on the amount of funding received (low, medium, or high). These regional categories were matched to the individual survey data to identify the citizens' regional funding level. As shown in Table 4, the minimum funding was 23 dollars per 1,000 inhabitants in the region, and the maximum was 15,953 dollars, with a standard deviation of 5,109 dollars, signaling a wide range in the funding amount. It should be noted that the maximum value was received by the East-South Central region, with the following amount being 4,991 dollars by the South Atlantic region. The median was 1,937 dollars, and the mean was 3,351 dollars, presenting a right-skewed dataset. Four regions were categorized as low funding, two as medium, and three as high. In the analysis, the respondents were further categorized into three time periods, with the before period of 2014 having 965 respondents and the after period of 2020 having 1,107 and 2021 having 1,010 (due to data availability, the 2020 dataset was used for the Energy Mix variable and the 2021 dataset for the three remaining variables).

Table 4. Descriptive Statistics for Independent Variable

Funding Level	Funding Range	Number of Regions (n = 9)	Number of Respondents (n = 2992)	Percentage in Sample
Low	23 – 157	4	1150	38%
Medium	1937 – 2276	2	694	23%
High	4641 – 15953	3	1148	38%

Note. The funding range is calculated for every 1,000 inhabitants and rounded to the nearest dollar. The percentage total is not 100% due to rounding to the nearest integer.

Table 5. Descriptive Statistics for Dependent Variable

Policy Variable	Number of Respondents (n = 2992)	Mean	Standard Deviation
CO2	1975	0.72	0.45
Energy Mix	1982	0.62	0.49
Research	1975	0.78	0.41
Coal	1975	0.65	0.48

Note. The means and standard deviations are rounded to the nearest second decimal place.

The dependent variable consisted of four variables about citizens' climate policy preferences: Regulating carbon dioxide as a pollutant (CO2), requiring electric utilities to increase the percentage of renewable energy in their energy mix even if it has an economic impact on households (Energy Mix), funding more research into renewable energy sources (Research), and setting strict emission limits on coal-fired power plants (Coal). The variables were recoded from four ordinal variables to binary variables of 0 (oppose) and 1 (support). The mean support for climate policies varied: at the highest, 78 percent supported funding research into renewable energy sources, while at the lowest, 62 percent supported requiring electric utilities to increase their usage of renewable energy at the expense of consumers (Table 5). Similarly, the Research

policy had the lowest variance, showing higher consensus (standard deviation [SD] = 0.41), while the Energy Mix policy had the highest variance, showing the most division among the sample respondents (SD = 0.49).

Table 6. *Descriptive Statistics for Control Variables*

Control Variable	Category	Number of Respondents (n = 2992)	Percentage in Sample
Party Affiliation	Republican	1182	40%
	Democrat	1317	44%
	Independent	271	9%
	No affiliation	222	7%
Gender	Female	1511	51%
	Male	1481	49%
Education Level	Less than high school	196	7%
	High school	716	24%
	Some college	915	31%
	Bachelor's or more	1165	39%
Income Level	less than \$50,000	920	31%
	\$50,000 to \$99,999	960	32%
	\$100,000 or more	1112	37%

Note. The percentage total may not be 100% due to rounding to the nearest integer.

Four control variables were included in the analysis: party affiliation, gender, education level, and income level. Preferences for all climate policies were heavily affected by the respondents' party affiliation, as shown in Figure 5, with Democrats more likely and Republicans less likely to support climate policies. Support for each policy varied among the Republican-leaning respondents, with the Energy Mix and Coal policies having up to twice as lower support as the Research policy. Comparing the change between before and after the initiative implementation, the support

increased across all policy variables for Democrats, and the support mostly decreased for Republicans, with the exception of the Energy Mix policy.

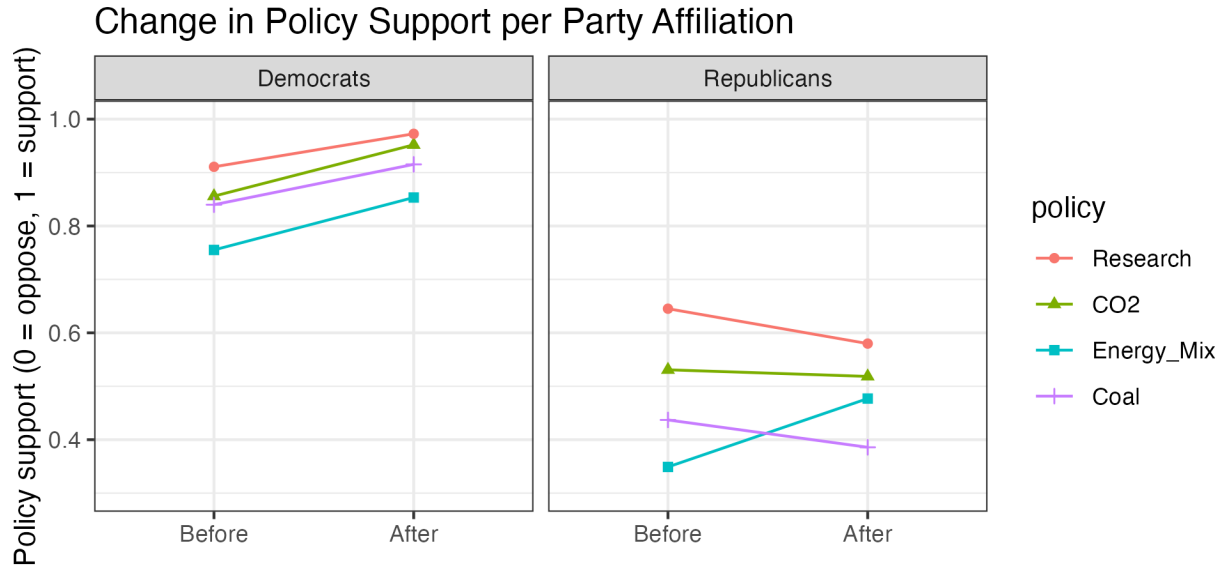


Figure 5. *Party Affiliation and Climate Policy Preference*

Note. Before is 2014. After is 2020 for the Energy Mix variable and 2021 for the CO2, Coal, and Research variables.

For the gender variable, Figure 6 shows that men and women had similar levels of support for climate policies in this sample. Women had varying shifts depending on the policy variable, with support for the Research policy decreasing and for the Energy Mix policy increasing, from before to after the initiative implementation. Although the preferences in relation to the respondent’s education level is obscure compared to other control variables, there is a positive trend for those with less than a high school education or more than a Bachelor’s degree, and a mixed trend for those with a high school diploma or college degree (Figure 7). Analyzing the income variable showed that higher income groups had higher levels of support for climate policies, and the lowest income group had a negative trend of support (Figure 8).

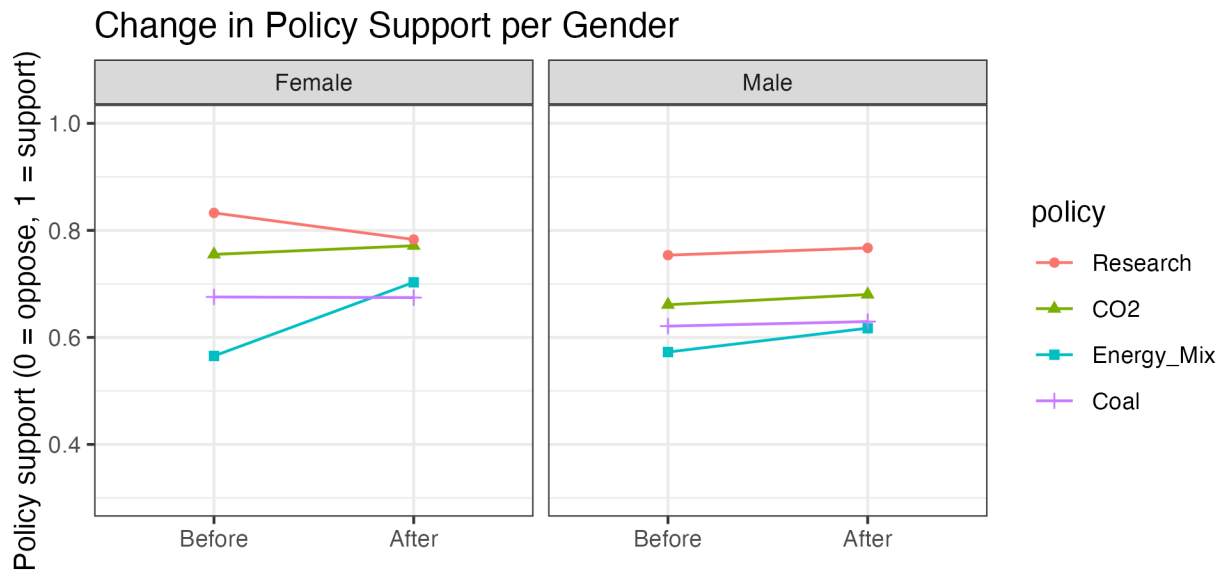


Figure 6. *Gender and Climate Policy Preference*

Note. Before is 2014. After is 2020 for the Energy Mix variable and 2021 for the CO2, Coal, and Research variables.

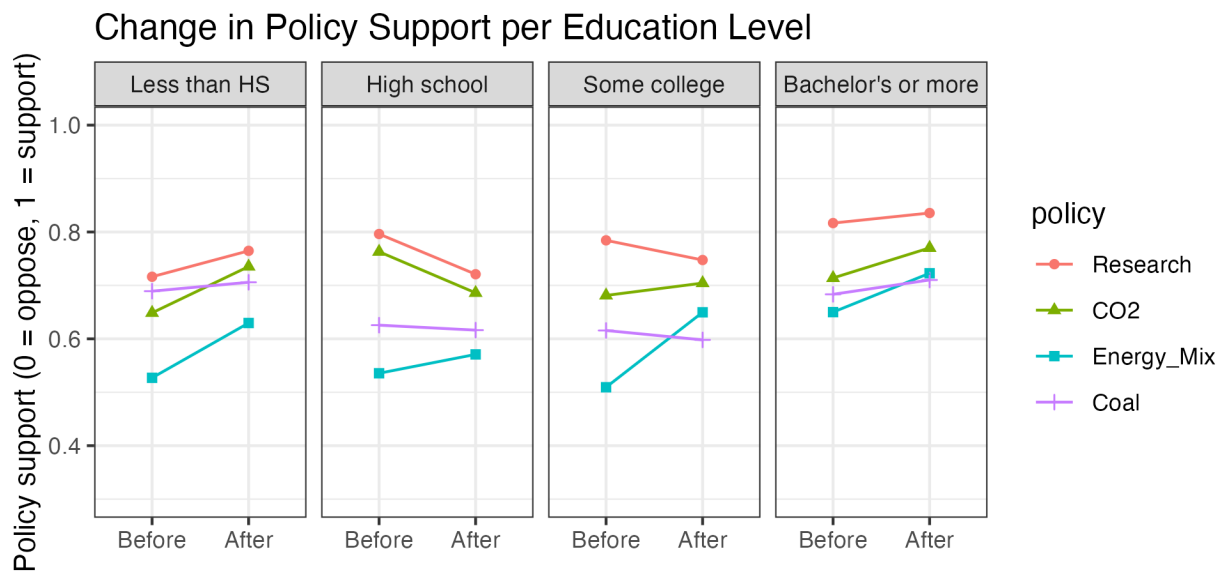


Figure 7. *Education Level and Climate Policy Preference*

Note. HS: High school. Before uses 2014 for all variables. After is 2020 for the Energy Mix variable and 2021 for the CO2, Coal, and Research variables.

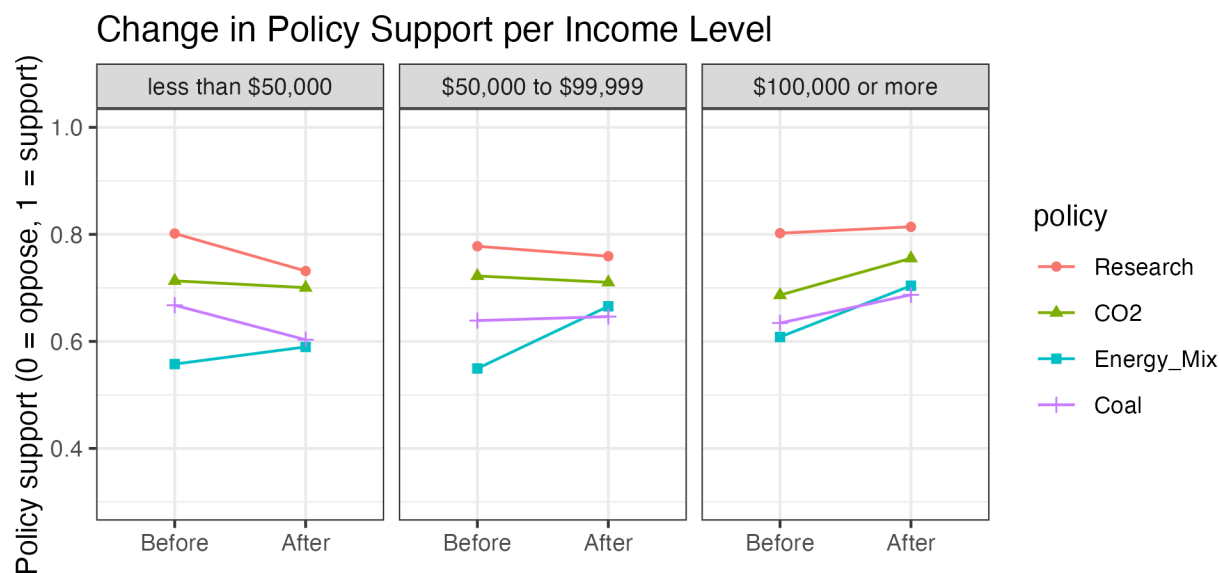


Figure 8. *Income Level and Climate Policy Preference*

Note. Before is 2014. After is 2020 for the Energy Mix variable and 2021 for the CO2, Coal, and Research variables.

3.2. Regional Differences for Policy Preference Change

Following the findings from the descriptive results, this section presents the results from analyzing the policy preference change from before to after just transition initiatives were implemented. The analysis method is two-fold, as explained in Section 2.4.4. First, logistic regression analyses were used to test the effects of the independent variable (regional funding level) on the dependent variable (climate policy preferences). Second, using these results, I compared the difference in policy support change between regions targeted by the initiative and others. A positive and statistically significant difference in policy support change among regions could suggest a regional difference when categorized based on just transition initiative funding level. Four models were created for each policy variable, and the complete results are included in Appendices B and C. Overall, a negative association was found between the initiative funding level and the Energy Mix variable, and the other policy variables did not have statistically significant results, while controlling for the effects of political affiliation, gender, education, and income.

First, support for the Energy Mix policy variable was associated with the regional just transition initiative funding category. The Energy Mix policy questionnaire asked whether citizens would support the increase of renewable energy in the energy mix, even if it entailed an additional cost.

The odds of supporting the policy increased from before to after the initiative implementation by a factor of 2.38 in low-funded regions, 1.13 in medium-funded regions, and 1.5 in high-funded regions, as shown in Figure 9. The difference in change when comparing regions showed that the odds for policy support increase was 2.11 times higher for low-funded regions than medium-funded regions ($p < 0.01$, 95% confidence interval [CI] = 1.26, 3.53) and 1.59 times higher for low-funded regions than high-funded regions ($p < 0.05$, 95 CI = 1.01, 2.51). The comparison between the medium and high-funded regions did not yield statistically significant results.

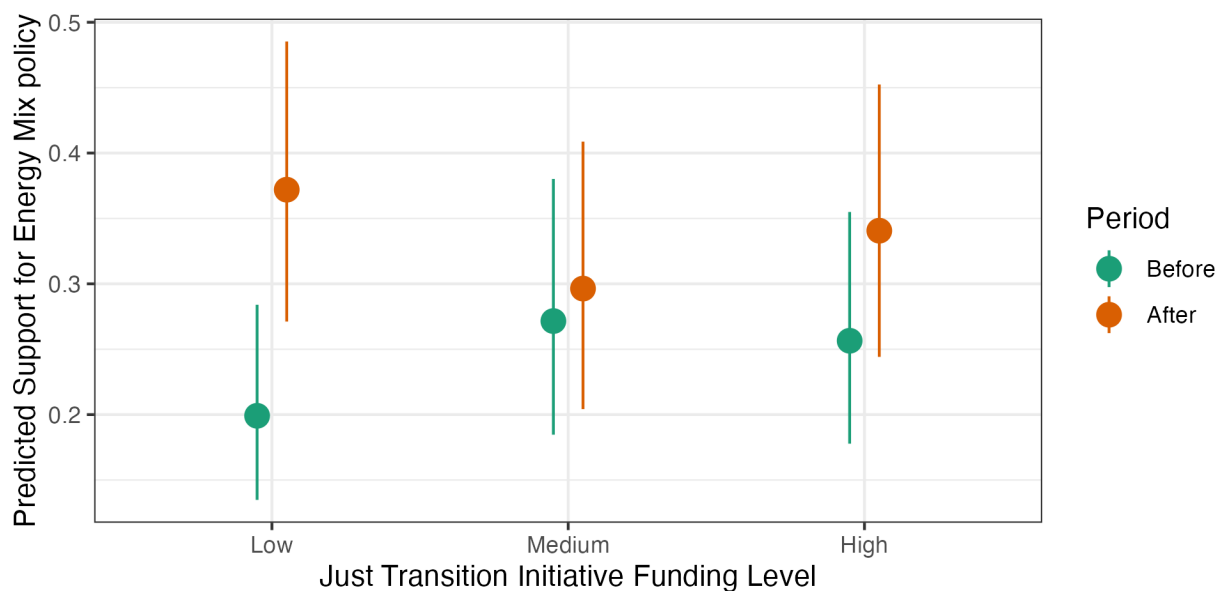


Figure 9. *Just Transition Initiative Funding’s Effect on Support for the Energy Mix Policy*

Note. The difference in change was statistically significant for the comparison between (1) low-funded regions and medium-funded regions, and (2) low-funded regions and high-funded regions.

As for the other policy variables, none of the results were statistically significant. Therefore, the results are presented as an extension of the descriptive results to deepen the discussion in the following section. Figures 10-12 offer two insights for my research question, by illustrating the comparison of policy preferences for the CO₂, Research, and Coal policy variables depending on the regional just transition initiative funding level categorization. First, in most cases, the low-funded regions have the lowest level of policy support in the before-measurement but reach a similar or higher level of support in the after-measurement. Second, the medium and high-funded

regions' support level over time decreases the most for the Research policy variable. These results will be further discussed in the following section.

As for the control variables, the regression results showed some insight into their roles. The party affiliation variables showed consistently statistically significant effects, with Democrats, Independents, and non-affiliated individuals having a higher likelihood of supporting the climate policies. Democrats had as high as 10.5 times the log odds of Republicans, indicating a large gap in the support level, complementing previous research about partisanship on climate policy. The gender variable had a statistically significant effect on two policy variables. For the Research and CO2 policy variables, women had 33 and 59 percent higher odds of support for these variables than men, respectively. As for the respondent's education level, a positive effect is statistically significant for those with higher education levels. Compared to those with less than a high school education, those with a Bachelor's degree or higher had higher odds of support for the CO2, Energy Mix, and Research policy variables. The income level's effect was less visible, as only the Energy Mix policy model showed a statistically significant effect for any of the groups. Here, the highest income group had 38 percent higher odds of support compared to the lowest income group.

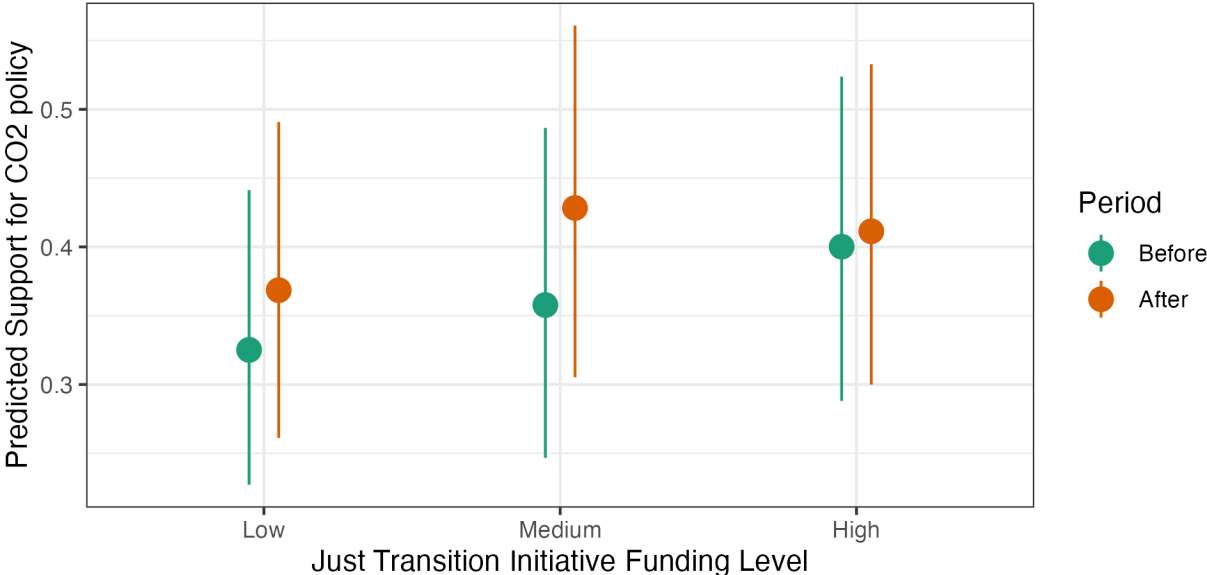


Figure 10. *Just Transition Initiative Funding's Effect on Support for the CO2 Policy*

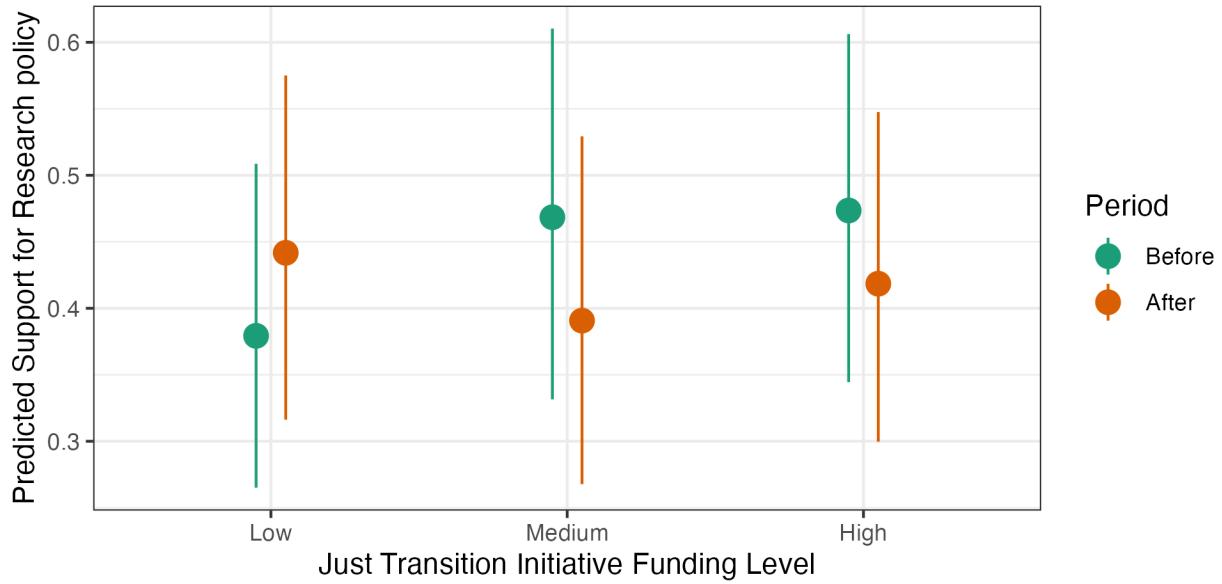


Figure 11. Just Transition Initiative Funding’s Effect on Support for the Research Policy

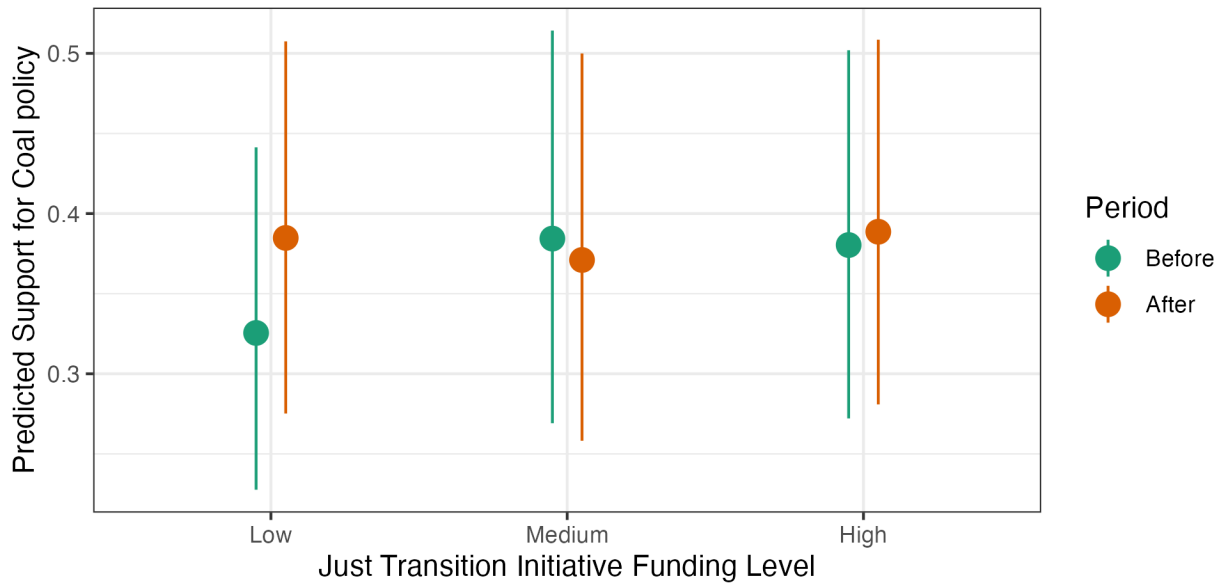


Figure 12. Just Transition Initiative Funding’s Effect on Support for the Coal Policy

3.3. Discussion

This thesis set out to examine how just transition initiatives influence citizens’ climate policy preferences in the U.S. Drawing on logistic regression analyses and temporal comparisons on the

CCAM dataset and just transition initiative funding data, the results offer several insights into the effectiveness of just transition initiatives to overcome grievances experienced in fossil fuel communities during a green transition. The analysis resulted in some association between initiative implementation and citizens' support for climate policies. While support for climate policy increased over time in general, the increase in targeted regions was relatively small or negative compared to non-targeted regions. In particular, low-funded regions experienced a much larger increase in support compared to medium and high-funded regions, with the results being statistically significant for the Energy Mix policy variable. This section will explore the theoretical and practical implications of these findings.

3.3.1. Just Transition Initiatives as a Counter Strategy—Yet to be Seen

While some previous studies (e.g., Bergquist et al., 2022; Gazmararian, 2024; Mundaca et al., 2018; Wang & Lo, 2021) have suggested the potential of highlighting justice to overcome climate policy opposition in fossil fuel communities, whether this materializes at a large scale is yet to be seen. This study examined initiatives totaling 950 million dollars over about half a decade, only a fraction of the U.S.'s multi-trillion annual fiscal budget (The U.S. Department of the Treasury's Bureau of the Fiscal Service, 2025). The expectation was for climate policy support to increase at a statistically significant level in regions receiving a high level of just transition initiative funding compared to regions receiving less funding. However, while not indicative of a causal relationship, this study's results show that regions targeted by these initiatives experienced a smaller increase in policy support compared to others. The results contrary to the literature could indicate insufficient funding, backlash to just transition initiatives and their intentions, unmet expectations, or unsuccessful initiative delivery.

Still, it is notable that highly funded regions had a larger increase in support than medium-funded regions. This may suggest that the amount of funding matters: high amounts of funding were more effective in overcoming climate policy opposition than medium amounts of funding. Additionally, it is possible that the initiatives influenced the targeted regions by minimizing the decline in climate policy support. Although this was beyond the scope of this thesis, future studies could examine this by utilizing different datasets that would specifically compare fossil fuel communities that received funds and those that did not. Another way is to examine the change in policy support by keeping the four categories for the dependent variable (strongly oppose, somewhat oppose,

somewhat support, and strongly support). By doing so, one could analyze whether the initiatives eased communities that initially strongly opposed the policy to somewhat oppose it, even if they do not necessarily reach the category of support.

3.3.2. Type of Climate policy: Proactive or Reactive

The second hypothesis regarding the policy type was partially supported, which stated that support for proactive policies, which create new assets (e.g., renewable energy) in communities, are more likely to change in reaction to just transition initiatives, than support for reactive policies, which remove existing assets (e.g., fossil fuel energy) in communities. The results showed that one of the proactive policies (the Energy Mix policy variable) had a pattern of association with the level of just transition initiative funds the region received, while none of the reactive policies (the CO₂ and Coal policy variables) were associated at a statistically significant level. The second proactive policy (the Research policy variable), albeit not at a statistically significant level, showed a weak pattern similar to the Energy Mix policy variable.

By dividing policies into those that add or remove assets in the community, the results could suggest that citizens hold stronger opinions about restrictive policies than about proactive policies. Furthermore, the questionnaire's wording may influence how citizens perceive the policies. While the reactive policies emphasize restrictive measures on fossil fuel communities, implying a concentrated and unfair punishment, the proactive policies are more assistive measures to invest in new assets, and the additional costs are imposed equally on all households. In this light, policymakers and climate activists may have a higher chance of shifting the support level for proactive policies, especially when combining them with just transition initiatives to appropriately communicate the shared burdens. It should also be noted that the CO₂ and Coal policies relate to public health outcomes by limiting emissions and improving air quality. As studies have found that rural communities support climate policies that reduce pollution more than other policies (Diamond et al., 2020), it could be the case that public health concerns outweigh just transition initiatives to influence support for reactive policies.

3.3.3. Further Observations and Speculative Interpretations

Beyond the core findings of this study, several contextual factors emerged during the analysis. While these are not central to the research question, they may be relevant for future studies

exploring the relationship between just transition initiatives and public support for climate policy. The first is the effects of the COVID-19 pandemic. Support for some climate policies appeared to decline in the after-measurement of 2020 and 2021. One plausible explanation is the impact of the COVID-19 pandemic, which shifted public priorities toward immediate health and economic concerns. It is possible that climate issues were temporarily deprioritized during this period, contributing to reduced enthusiasm for climate-related measures.

The second is the decline in support for the Research policy variable. While support for most climate policies increased over time in regions targeted by the just transition initiatives, though not as much as in the non-targeted regions, the Research policy variable experienced a decrease in medium and highly funded regions. Although the reasons for this are not fully clear, one possible interpretation is that growing anti-science sentiment or distrust in expert-driven policy may have played a role. This trend may reflect the incumbent's success in mobilizing the countermovement population using informational tactics, as discussed in section 1.1.2. The varying trends depending on the climate policy merit closer examination in future research.

Finally, the exclusion of recent initiatives implemented by the Biden administration should be noted. From 2021 to 2024, several large-scale just transition initiatives were introduced, such as the Coal Communities Commitment in the American Rescue Plan Act (ARPA) and the Interagency Working Group (IWG) activities on Coal and Power Plant Communities and Economic Revitalization. While these initiatives could not be examined in this study, due to the lack of data, they may have a meaningful impact on public attitudes in the near future. Future studies may benefit from assessing how these newer programs, alongside the broader green policies introduced since 2021, affect public support for climate transition policies across different regions.

3.3.4. Limitations of the Results

While the findings offer important insights, several limitations should be acknowledged. Here, I outline considerations for interpreting the results within broader political and social contexts. The first limitation concerns the precision of some of the estimated effects. For example, while the odds ratio for the initiative's association with the Energy Mix policy variable was statistically significant ($p < 0.01$) when comparing low and medium-funded regions, the associated 95% confidence interval was wide (1.26, 3.53). This indicates a degree of uncertainty about the true magnitude of the effect. Although the lower bound is above 1, the wide range implies that the effect

range could vary substantially. This may be due to sample size limitations, response variability, or underlying heterogeneity within the population. Future research with larger or more targeted samples could help provide more precise estimates.

Secondly, this study's assumption, that just transition initiatives are targeted at fossil fuel communities with economic and cultural grievances that are susceptible to being mobilized by the incumbent, should be accepted with reservations. While the initiatives are generally targeted towards this population, the outcome is sometimes misaligned. For example, a report on the POWER initiative finds that 33 percent of grants were directed to non-coal communities (Shelton et al., 2022). This may result in a mismatch between actual fossil fuel communities and fund recipients. Future studies could overcome this potential discrepancy by limiting the scope to initiatives explicitly targeting coal communities, like the AMLER initiative, by referring to discussions about recognition justice in Section 2.2.2.

Conclusion

The purpose of this thesis was to contribute an empirical examination of whether just transition initiatives could overcome citizens' resistance to climate policies. It focused on just transition initiatives targeting energy communities (i.e., fossil fuel workers and communities), one of the most politicized and successful counter-movement communities to climate change politics. To explore the main research question, "How do just transition initiatives influence citizens' preferences for climate policy?", I established two hypotheses. The first hypothesis was that just transition initiatives positively influence citizens' climate policy support, with the higher the level of funding in a region, the higher the policy support increase. The second was that support for proactive policies, which create new assets (e.g., renewable energy) in communities, is more likely to change in reaction to just transition initiatives than support for reactive policies, which remove existing assets (e.g., fossil fuel energy) in communities. The hypotheses were built on previous literature about climate change politics, just transition, and determinants of climate policy preferences, as discussed in detail in the first chapter.

The second chapter outlined the research design for this study. The research was designed by distinguishing between U.S. regions targeted and not targeted by federal just transition initiatives, and then analyzing the change in each region's citizens' policy preferences over time. The expected results were to see a positive and statistically significant difference between the change in support in targeted regions and non-targeted regions. The amount of funding received in each region through the two initiatives, the POWER and AMLER initiatives, was based on data collected and compiled for this study. Policy preferences were measured through the Climate Change in the American Mind (CCAM) dataset, a representative dataset collected by the Yale Program on Climate Change and Communication and the George Mason University Center for Climate Change Communication. Previously established control variables—political affiliation, gender, education level, and income—were included to isolate the initiatives' effects as much as possible.

The empirical results, presented in the third chapter, showed that regions targeted by just transition initiatives experienced a smaller increase in support for climate policies compared to non-targeted regions. In particular, the only policy variable that had statistically significant results in relation to the regional just transition funding level was the Energy Mix policy variable. This variable was based on a questionnaire asking whether the respondent would support requiring electric utilities

to increase the percentage of renewable energy sources in their energy mix, even if it resulted in an additional cost for households. While the overall policy support increased in most regions for most policy variables, the influence of just transition initiatives is yet to be seen, rejecting the first hypothesis for this study. The second hypothesis was partially supported, as one of the proactive policy variables (the Energy Mix policy variable) was associated with the funding level through just transition initiatives, while none of the reactive policy variables (the CO₂ and Coal policy variables) were.

The results have two implications for future studies and policy designs. Firstly, the amount of funding may matter, as the analysis results show that medium-funded regions had more negative results than highly funded regions for citizens' policy preferences. This implication should be further explored in future studies through more narrow data from fossil fuel communities. Secondly, the differing results based on the distinction between proactive and reactive policies suggest the importance of prioritizing and framing. Citizens may have a more flexible attitude toward proactive policies, implying new assets, over reactive policies that may remove existing jobs and facilities. Policymakers and climate activists should prioritize more receptive policies to create positive sentiment in fossil fuel communities before pushing reactive policies with more negative connotations.

However, due to constraints on the study design, the results should not be interpreted as proof of causality, but rather as a guide for further research. Three main limitations should be noted. First, citizen preferences and initiative funding are aggregated at the nine U.S. census regions, while the funding is usually received at smaller community levels. Although the aggregation ensures the necessary survey sample size, it makes the results less concrete for the purpose of this study. Second, the just transition initiatives' effects may not have materialized yet. The analysis period in this study is six to seven years between before and after the initiative implementation. As policy impacts are expected to materialize over a long time, the analysis period could create limitations. Third, the initiative funding could be received by non-fossil fuel communities, creating a misalignment between this study's assumption about just transition initiatives' targeted regions. Fund recipients, especially for the POWER initiative with a competitive selection process, may not fully align with this study's definition of the countermovement population.

Nevertheless, this study aimed to fill the gap in just transitional studies and contributed by conducting an empirical examination of the effects of implemented initiatives on citizens' climate change policy preferences. The findings should guide future studies with a narrower focus on the type of policy or in a different country or regional context. Additionally, in the American context, more recent green policies and just transition initiatives would require a close examination as the effects unfold. Faced with one of the most significant societal transitions in history, we must acknowledge and address the transitional pain felt in communities that have supported economic development thus far. Understanding how justice enables societal transitions will not only be fruitful for the climate crisis, but also for other challenges in the future.

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Appendices

Appendix A. Just Transition Initiative Funding Per 1,000 Inhabitants (USD) and Categorization

Region	POWER	AMLER	Total	Category
Pacific	23	0	23	Low
West-South Central	80	0	133	Low
New England	104	0	587	Low
West-North Central	157	0	3,460	Low
East-North Central	1080	857	3,983	Medium
Mountain	966	1310	4,662	Medium
Mid-Atlantic	1490	3151	8,242	High
South Atlantic	2237	2754	9,540	High
East-South Central	6871	9082	21,094	High

Note. Rounded to the nearest dollar and sorted by the total funding received through initiatives from lowest to highest. Source. Funding data for the POWER initiative (Shelton et al., 2022); Funding data for the AMLER initiative (U.S. Department of the Interior, n.d.); Population data to find the funding amount per 1,000 inhabitants (U.S. Census Bureau, Population Division, 2019).

Appendix B. Regression Results

Just transition initiative's effect on citizens' policy preferences

	CO2	Energy Mix	Research	Coal
<i>Predictors</i>	<i>Log-Odds</i>	<i>Log-Odds</i>	<i>Log-Odds</i>	<i>Log-Odds</i>
Intercept	-0.968 *** (0.261)	-1.477 *** (0.244)	-0.638 * (0.278)	-0.823 ** (0.259)
Medium funding	0.145 (0.203)	0.405 * (0.186)	0.366 (0.227)	0.258 (0.200)
High funding	0.325 (0.180)	0.328 * (0.163)	0.387 * (0.197)	0.241 (0.175)
After-measurement (excl. Energy mix)	0.192 (0.176)		0.258 (0.192)	0.259 (0.172)
Democrats	2.207 *** (0.140)	1.821 *** (0.117)	2.358 *** (0.166)	2.332 *** (0.129)
Independent	0.438 ** (0.169)	0.466 ** (0.172)	0.510 ** (0.180)	0.460 ** (0.165)
No party	1.108 *** (0.205)	1.201 *** (0.197)	1.331 *** (0.234)	1.297 *** (0.195)
Gender (ref: female)	0.466 *** (0.112)	0.170 (0.102)	0.285 * (0.121)	0.186 (0.108)
High school	0.492 * (0.231)	0.085 (0.219)	0.474 (0.245)	-0.042 (0.230)
Some college	0.427 (0.226)	0.326 (0.216)	0.631 ** (0.242)	-0.024 (0.226)
Bachelor's degree or higher	0.494 * (0.233)	0.607 ** (0.221)	0.806 ** (0.251)	0.199 (0.233)
Medium income	0.187 (0.140)	0.216 (0.128)	0.089 (0.149)	0.149 (0.135)
High income	0.176 (0.150)	0.324 * (0.138)	0.249 (0.164)	0.138 (0.146)
Medium - after (excl. Energy mix)	0.105 (0.289)		-0.576 (0.313)	-0.316 (0.280)

Appendix B Continuation

High - after (excl. Energy mix)	-0.145 (0.251)		-0.481 (0.273)	-0.224 (0.243)
After-measurement (Energy Mix)		0.868 *** (0.167)		
Medium - after (Energy Mix)		-0.746 ** (0.263)		
High - after (Energy Mix)		-0.464 * (0.234)		
Observations	1975	1982	1975	1975
R ² Tjur	0.167	0.163	0.149	0.210

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Appendix C. Regional Comparison for the Change in Policy Preferences Over Time

Compared Regions	Odds ratio	Standard error	P-value	Lower confidence limit	Upper confidence limit
Regional Differences in Support Change for the CO2 Policy Variable					
Low / Medium	1.11	0.32	0.717		
Low / High	0.86	0.22	0.562		
Medium / High	0.78	0.23	0.391		
Regional Differences in Support Change for the Energy Mix Policy Variable					
Low / Medium	0.47	0.12	0.005	0.28	0.79
Low / High	0.63	0.15	0.047	0.40	0.99
Medium / High	1.33	0.35	0.282		
Regional Differences in Support Change for the Research Policy Variable					
Low / Medium	0.56	0.18	0.065		
Low / High	0.62	0.17	0.077		
Medium / High	1.10	0.35	0.763		
Regional Differences in Support Change for the Coal Policy Variable					
Low / Medium	0.73	0.20	0.259		
Low / High	0.80	0.19	0.356		
Medium / High	1.10	0.31	0.744		

Note. The 95% confidence interval is shown only for results with a p-value lower than 0.05.

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