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Introduction

Can We Decarbonize?

1.1 CAN WE DECARBONIZE?

Passed in August 2022, the Inflation Reduction Act (IRA) is the first federal law to confront climate change explicitly. The Congressional Budget Office estimated that the IRA would reduce the deficit by some $305 billion over a ten-year time horizon, and the estimated $390 billion in expenditures for decarbonization is to be paid for by some $700 billion in annual revenue from savings and other revenue collection.[1] Other observers, however, noted that much of the IRA's spending is in the form of uncapped tax credits for renewable energy technologies. The successful uptake of those technologies could result in tax spending of $1 trillion over the ten-year budgeting period.[2]

About a year after the Act's passage, the Environmental Protection Agency (EPA) and the National Academies of Sciences, Engineering, and Medicine conducted studies attempting to determine the amount of decarbonization the IRA would induce. Both studies found it to be highly open-ended. The EPA modeling, for instance, estimated that the IRA would spur "substantial emission reductions from the electric sector of 49 to 83% from 2005 levels in 2030."[3] The study attributed the rather open-ended prediction to the indeterminacies of "implementation."[4] Similarly, the NAS study examined several models of the emission reductions expected from the IRA. It concluded that those models indicated that "with effective implementation of the provisions of the IRA, the United States is likely to be close

[1] CBO, "Estimated Budgetary Effects of Public Law 117–169, to Provide for Reconciliation Pursuant to Title II of S. Con. Res. 14" (2022), www.cbo.gov/publication/58455 (accessed October 12, 2024).

[2] John E. T. Bistline, Neil R. Mehrotra, and Catherine Wolfram, "Economic Implications of the Climate Provisions of the Inflation Reduction Act," *Brookings Papers on Economic Activity* (Spring 2023): 77–157, www.brookings.edu/wp-content/uploads/2024/01/16653-BPEA-SP23_WEB_Bistline-et-al-session_print.pdf (accessed March 18, 2024).

[3] EPA, "Electricity Sector Emissions Impacts of the Inflation Reduction Act: Assessment of Projected CO_2 Emission Reductions from Changes in Electricity Generation and Use" (2023), p. 9.

[4] See ibid., p. 15.

to the trajectory required to achieve the 2050 emission reduction targets set by the White House. However, there are significant risks."[5]

Further, significant headwinds have arisen. In *West Virginia v. EPA*, the Supreme Court introduced the novel "major questions doctrine" and relied upon it to strike down the EPA's Clean Power Plan, the Obama administration's attempt to regulate greenhouse gas from stationary sources.[6] The doctrine is highly favorable to incumbent interests, who are relying upon it to attack a suite of environmental regulations, many of which seem to be very much authorized by the "plain" text of the statute.[7] Judges across the country may now use this open-textured and indeterminate doctrine to strike down otherwise statutorily authorized and beneficial climate rules.

Similarly, although America's offshore wind resources are extensive, several projects have been canceled, despite the generous tax credit offered by the IRA. Citing "high inflation, rising interest rates and supply chain constraints, particularly a vessel delay," Orsted canceled its New Jersey offshore wind project in October 2023.[8] Many pinned the blame for the lack of vessels on the Jones Act, a 1920 protectionist law that prohibits vessels from shipping cargo between US ports unless they are American-flagged, American-built, and crewed by Americans.

In 2023, the only prospective Jones Act–compliant vessel, the *Charybdis*, was under construction at Brownsville, Texas. Curiously enough, the construction costs of the *Charybdis* are to be covered, in the first instance, by the customers of Dominion Energy, one of Virginia's two main electrical power companies. In 2020, when Democrats had controlled all three branches of government, Virginia had passed the Virginia Clean Economy Act (VCEA). The Act declared up to 5,200 MW of offshore wind to be in the "public interest" (a legal term). The first stage of Dominion's offshore construction, called the Coastal Virginia Offshore Wind project, comprises 147 turbines, with a total capacity of about 2,500 MW. According to Virginia law, the Virginia State Corporation Commission (SCC) supervises Dominions' expenditures and rates. If the SCC certifies those expenditures as "prudent," then Dominion may pass those costs, along with a rate of return on capital, to

[5] National Academies of Sciences, Engineering, and Medicine, *Accelerating Decarbonization in the United States: Technology, Policy, and Societal Dimensions* (Washington, DC: The National Academies Press, 2023), p. 45, https://doi.org/10.17226/25931 (accessed March 18, 2024).

[6] *West Virginia v. EPA*, 597 U.S. 697 (June 30, 2022).

[7] Michael Burger and Cynthia Hanawalt, "The Major Questions Doctrine Is a Fundamental Threat to Environmental Protection: Should Congress Respond?," Climate Law: A Sabin Center Blog, October 19, 2023, https://blogs.law.columbia.edu/climatechange/2023/10/19/the-major-questions-doctrine-is-a-fundamental-threat-to-environmental-protection-should-congress-respond/ (accessed March 18, 2024). One lower court, for instance, relied upon the doctrine to throw out an EPA regulation of hydrofluorocarbons (HFCs) that required the appropriate transportation and tracking of HFCs. The court even acknowledged that the EPA had the authority to regulate HFCs.

[8] Orsted, "Orsted Ceases Development of Ocean Wind 1 and Ocean Wind 2," Press Release, October 31, 2023, https://oceanwindone.com/news-archive/2023/11/orsted (accessed March 18, 2024).

ratepayers. A critical aspect of US decarbonization, then, hinges upon the political disposition of the SCC's three commissioners.

By the law of Virginia, the House of Delegates and the Senate appoint the SCC commissioners. Virginia holds its state election in odd years, when there are no federal elections, and the turnout is usually dampened. Apparently riding a backlash against the Supreme Court's overturning of *Roe v. Wade*, Democrats took control of both houses of Virginia's General Assembly in the 2023 elections. While they did not hold a trifecta, state law provides no role for the governor in appointing commissioners. Hence, after years of multiple vacancies at the SCC, the same political coalition that passed the VCEA and the IRA shall sculpt the political disposition of the SCC for the duration of the first stage of the Coastal Virginia Offshore Wind project, seemingly securing the viability of the *Charybdis*.

The story of the *Charybdis* is one of thousands upon thousands of "implementation" decisions in need of a correct resolution if we are to secure the decarbonization benefits of the IRA. Coming in with a construction bill of upward of $650 million, 10 percent of which is covered by an IRA tax credit, *Charybdis* stands at the central node of a network of social actors confronting, for various reasons and with various degrees of vigor, the climate crisis: Dominion's shareholders, Dominion's customers, northern Virginia data centers, shipbuilders, nation-states, and the US Navy. The vessel is socially coded by its eco-modernism – the ability to channel the forces of mercantilistic capitalism toward decarbonization at the hazardous oceanic frontier of development.

At the other "end" of the spectrum, in the routine going-abouts of families and neighbors, America's Rescue Plan (March 2021) appropriated $100 million to the EPA for Climate Justice initiatives. The IRA greatly increased this funding, and the EPA granted $53 million of it to 132 enhanced air quality monitoring projects.[9] For the first time, nonstate social actors have in their hands equipment for monitoring the air they breathe, with some prospect of detecting and expelling the source of their aliments. Mostly small and local nonprofits, these social actors are also operating at their own frontier, with its own hazards. Ethnicity/race remains the number one predictor of excessive and disproportionate exposure to air pollution, and nothing in the IRA confronts this environmental racism directly. Whatever these nonprofits might detect with their monitoring, the federal and state governments retain authority to enforce air pollution laws. Many of these nonprofits, then, face the prospect of detecting the origin of their ailments, only to be left adrift, powerless to expel the environmental insult from their communities.

In short, while the amount of money the IRA invests is significant, linking those federal investments with decarbonization depends upon what we do with the rescrambling of opportunities provided by the IRA, along with other laws and policy.

[9] See Chapter 10.

Do those opportunities molder until, perhaps, a revanchist administration hollows them out? Or do we nourish them into a robust confrontation with the climate crisis?

This book is a little effort in support of the latter, a democratic decarbonization.

1.2 DECARBONIZATION AND SOCIAL THEORY

One of the main subarguments of this book is that the IRA introduced new social actors into the decarbonization effort and rescrambled opportunities for social action. The absolute amount of money that might be spent under the IRA, as well as whether that money actually induces decarbonization, depends upon how well social actors cultivate this new suite of opportunities.

The IRA contains a great variety of policies and programs. Each needs "implementation" by one or more administrative agency, in the context of statutory deadlines and an inherited set of rules. The Treasury, for instance, is responsible for administering the clean energy tax credits, while the EPA is administering the new Climate Justice grants programs. Each of the IRA programs will interact with other federal policies, such as the Clean Air Act (CAA) and the Federal Power Act, as well as subnational policies, such as each state's environmental and utility law. How might one conceptualize the relationship between these policies, at different levels of governance?

To approach this task, we develop four social theories and then "apply" each to one aspect of the IRA. Before, however, discussing what social theory is in the last part of this introduction, we consider three other common ways of grouping decarbonization policy. This offers a contrast to the sociological approach and allows us to get a lay of the land.

To begin with, we imagine listing each of the IRA policies, perhaps along with a two-sentence description, then grouping them. Along what principle could they be grouped? Three approaches are prevalent: a juridical framework, an economic sector framework, and a greenhouse gas inventory framework. Each of these is helpful in its own right and we rely upon them throughout.

1.2.1 *The Juridical Framework*

First, one could group IRA policies by the federal agency that is implementing them, such as the EPA, the Federal Energy Regulatory Commission, or the Department of Energy. This would provide a view of each agency's authority and responsibility. It might be the point of view one would take as the head of an agency, attempting to organize that agency's decarbonization efforts. It is also the point of view one might want to take in order to conceptualize the relationship between the decarbonization efforts of different agencies. This way of grouping policies centers what the law is, so we will label it the juridical framework.

The juridical framework facilitates very useful policy analysis. First, with this framework, one can "follow" the administrative implementation of IRA programs

(and others). The result would be a sort of database tracking the progress of implementing different aspects of the law. The Inflation Reduction Act Tracker developed by the Sabin Center for Climate Law and Environmental Defense Fund is an example.[10]

Second, with the juridical framework, one can do "deep dives" on decarbonization opportunities available to administration agencies. These analyses would assess the opportunities available under the law's different provisions. They would include how past administrations have interpreted the provision, how the courts have interpreted the provision, and how the provision might interact with other statutory laws. Law review articles and policy memos would advise on those opportunities, digging into the intricacies and advising on courses of administrative implementation. For instance, one might write about the interaction between a carbon price and various provisions of the CAA. The book *Legal Pathways to Deep Decarbonization in the United States*, for instance, provides such deep dives on what administrative implementation might be undertaken to facilitate decarbonization.[11]

Third, the juridical framework is also useful to identify gaps in regulatory authority that might need bridging through statutory revisions. The 116th Congress, for instance, established a Select Committee on the Climate Crisis. The committee's majority staff report, published in June 2020, was some 530 pages of recommendations to enhance or introduce new climate-oriented authority and programs across the federal government.[12]

Since law is the language of policy, and since this book is about decarbonization policy, this book relies upon the juridical framework. While we will undertake a few analyses from this point of view, as examples of the intricacies of implementation, one need not be a legal expert to understand them.

1.2.2 *The Economic Sector Framework*

Second, with the economic sector framework greenhouse gas emissions are categorized by the economic sector from which they originate. The conventional and overarching categories here are transportation, electrical power, industry, residential, and agriculture. These coarse categories can, in turn, be subdivided for increased granularity. One might subclassify agriculture emissions by whether they originate from cattle or from the use of fertilizer. One might subdivide residential emissions by whether they originate from single-family or multifamily residences.

[10] Sabin Center and the EDF, "Inflation Reduction Act Tracker" (2024), https://iratracker.org/ (accessed March 20, 2024).

[11] Michael Gerrard and John Dernbach, *Legal Pathways to Deep Decarbonization in the United States* (Washington, DC: Environmental Law Institute, 2019).

[12] House Select Committee on the Climate Crisis, Majority Staff Report, "Solving the Climate Crisis: The Congressional Action Plan for a Clean Energy Economy and a Health, Resilient, and Just America" (June 2020).

In the electrical power sector, one might distinguish between those from coal-fired and methane-fired plants.

The economic sector framework is one of main starting points to model decarbonization policies and decarbonization scenarios. For instance, Hal Harvey's *Designing Climate Solutions* and the associated online policy evaluator, the Energy Policy Simulator, use the economic sector framework to project the expected decarbonization resulting from different policies.[13] Similarly, the EPA's projection of the IRA's decarbonization was a synthesis of nine different models, each of which relied upon the economic sector framework. The EPA presented its results as a matrix summary. The NAS also analyzed the projected decarbonization impact of the IRA. Like the EPA study, the NAS report divided decarbonization by economic sectors. In addition to the anticipated mitigation, it relied upon the values of equity and fairness, health, employment, and public engagement to recommend policies that would enhance the IRA's implementation. As with the EPA analysis, the NAS presented a matrix summary of its policy recommendations.

Multiple administrative agencies and multiple policies might have jurisdiction over any one of the economic sectors. This jurisdiction, further, is at different levels – government, federal, state, or even local. For instance, through CAA Section §202, the EPA has jurisdiction over greenhouse gas emissions from mobile sources, that is, transportation emissions. The CAA prohibits most states from establishing their own mobile source standards, but because California had enacted its own clean air laws prior to the passage of the federal statute, the CAA allows it to establish more stringent mobile source emission standards than the EPA might establish. California's authority, however, depends upon receiving from the EPA a "waiver" approving its mobile source regulations (CAA §209). Once the EPA grants the §209 waiver, furthermore, any state in "non-attainment" for one or more air pollutants may opt-in to the California standards (CAA §177). To further complicate the overlap and rescrambling of jurisdictions, since electric vehicles (EVs) shall replace combustion engines, and EVs are a load on the electrical grid, state utility commissions, such as the Virginia SCC, also have jurisdiction over transportation emissions.

Grouping decarbonization policies by economic sector, then, is a useful approach to policy analysis. While this book makes abundant use of studies from the economic sector framework, it is not of that discipline, for two main reasons. First, economic-decarbonization models are populated with abstract social actors, such as "industry," or particular industries, such as "steel manufacturing." A model then projects the behavior of those social actors in response to some stimulus, such as IRA policies. The model's output is the projected results of that behavior, such as greenhouse gas abatement. Every model has indeterminacies (or "gaps") between input

[13] Hal Harvey, *Designing Climate Solutions: A Policy Guide for Low-Carbon Energy* (Washington, DC: Island Press, 2018); Energy Innovation, Policy & Technology LLC, "Modeling and Analysis" (2024), https://energyinnovation.org/policy-programs/policy-and-analysis/ (accessed March 20, 2024).

and output, of which modelers, to various degrees, are self-conscious. This book is about those indeterminacies, but not to fix them and thereby construct a perfect model. Rather, it is about them per se and, hopefully, about where social action can facilitate decarbonization.

Second, the economic sector framework has a status quo bias. It populates its models with currently existing social actors ("industry") whose behavior is usually assumed to be some sort of optimizing. Perhaps these social actors are assumed to be responding to price signals, for instance. In centering currently existing social actors, the models assume the repetition of those social actors and their motives. These models, for instance, assume that the automobile will continue to remain the main mobility modality in a decarbonized world, rather than, for instance, the bicycle within a bike-centric infrastructure. In contrast, one of the premises of this book is that new social actors have entered the decarbonization effort, whose activity might (and must) disturb the status quo to achieve decarbonization.

1.2.3 *Greenhouse Gas Inventory Framework*

Third, some greenhouse gases are more potent than others, so one might group the policies by the species of greenhouse regulated, such as carbon dioxide, methane, fluorinated gases, or black carbon. By identifying the source of the greenhouse gases, one has a method for building a greenhouse gas emissions inventory. These inventories can be quite granular. The annual US greenhouse gas emissions inventory, for instance, distinguishes between carbon dioxide emissions from lime production and cement production.[14]

A granular inventory of greenhouse gases by type and source is indispensable for decarbonization policy. Such inventories produce a sort of etiology of greenhouse gas pollution. The relationship between greenhouse gas inventories and policy is twofold. First, granular etiologies of pollution allow for the development of policies targeting those emissions. For instance, black carbon has two main sources, diesel trucks and open fires, such as cook stoves and forest fires. Unlike the other greenhouse gases, black carbon does not trap infrared wave lengths as they radiate from the earth's surface back into space. Rather, its dark color absorbs sunlight. It is also a "short term" pollutant because it does not accumulate in the atmosphere in the same way as the other greenhouse gases. However, global circulations of air currents also tend to draw black carbon to the Arctic, where its deposition on the snow hastens Arctic heating. With this etiology of black carbon, we can now begin to discuss modes of replacing cook stoves and diesel engines, perhaps starting with those sources where mitigation has the most cobenefits to human health.

[14] EPA, "Inventory of U.S. Greenhouse Gas Emissions and Sinks" (2024), www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks (accessed March 20, 2024).

Second, the development of those greenhouse gas inventories is itself a policy decision. The EPA produces the US greenhouse gas inventory, along with the monitoring and modeling work, to meet the US commitments under the United Nations Framework Convention of Climate Change, ratified by the US in 1992. Similarly, the EPA required stationary sources to monitor and report greenhouse gas emissions only in 2009, in response to two political developments: first, in 2007 the Supreme Court held in *Massachusetts v. EPA* that greenhouse gases are "air pollutants" for purposes of the CAA, thus enabling the EPA to monitor and regulation greenhouse gases, and second, the 2008 election installed an Administration willing to use this CAA authority over greenhouse emissions to require monitoring and reporting.

As with the juridical and economic frameworks, the greenhouse gas inventory framework is mission critical to decarbonization. Without etiologies of greenhouse gas pollution, we cannot determine what needs to be done to abate greenhouse gas emissions, nor can we know whether what we are doing is, in fact, abating these emissions. However, while greenhouse gas inventories display opportunities to decarbonize, they provide no conceptualization of the social actions needed to form decarbonization policies, nor what those policies might be.

In short, this book relies upon the juridical, economic sector, and greenhouse gas inventory frameworks in its analysis, but it is not an analysis from the perspective of any one of these frameworks. Instead, it develops social theories to articulate possible relationships between our inherited suite of polices and institutions. What, then, is social theory, and why might it be helpful for thinking about decarbonization policy?

1.3 WHAT IS SOCIAL THEORY, AND WHY RELY UPON IT FOR CLIMATE POLICY?

One of the other subarguments of this book is that the IRA rescrambles opportunities for decarbonization but that the three prevailing frameworks for classifying decarbonization policy are inadequate to conceptualize that rescrambling. While the juridical, economic sector, and greenhouse gas inventory frameworks are all useful, they all conceptualize the social world from within the prevailing ways of doing things. The juridical framework describes what the state is doing, the economic sector framework models the behavior of extant economic actors, and the greenhouse gas inventory framework describes past and current greenhouse gas emissions.

Social theory, in contrast, attempts to describe and explain the social world from a point of view exterior to that social world, what we shall call the "critical point of view." While "theory" is frequently used to mean speculative or ungrounded, for those who theorize, it has a straightforward meaning. Theorizing is the practice of developing general, abstract concepts to explain a chosen area of study. Abstracting also has a simple meaning. When a concept is "abstract" it captures what is the same

among two or more diverse cases. We use abstract concepts all the time and, indeed, have done so already. For the juridical framework, we relied upon the abstract concept of administrative jurisdiction. For the economic sector framework, we relied upon economic classifications, such as industry. For the greenhouse gas inventory framework, we relied upon the different species of greenhouse gases.

Of note, when we abstract to what is the same in a diversity of cases, we leave aside what makes those cases different. For instance, "homeowner" is an abstract concept, capturing what is the same about the dwelling patterns of one subpopulation of a society. "Homeowner" distinguishes one experience of dwelling from others, such as "renter." It also leaves aside the profoundly different experiences of African Americans and white Americans in the purchasing of and living in a home. The theorist can add more or less detail, more or fewer subdivisions, to social concepts. For instance, in the environmental justice (EJ) portion of this book, we discuss how the governmental policy of redlining restricted Black Americans' access to home financing, facilitating the segregated and exploitive living patterns that still characterize contemporary American society.

Social theory, then, aims to characterize human societies, or a particular human society, and to describe how different social actors interact with one another in those societies. It also aims to describe the affiliations and antagonisms between those different social actors, as well as the mechanisms by which societies both change and remain the same. In contrast to the three frameworks presented earlier, social theory takes a critical point of view.

This book's social theory is introductory, which is not to say it is easy. First, much of the social theory we will be working with was originally written in German and French. Sometimes the key concepts from these texts can be translated "directly" into English, but sometimes doing so changes the connotation and the context of those words. When this happens, a theorist must decide whether to keep the original word or rely upon a translation. Many theorists prefer to use the word untranslated. I'm usually in this camp, but in this book, I use only a few German words to express sociological concepts. In such instances, I do not assume that the reader has prior knowledge of these concepts.

Second, we rely on abstract concepts all the time, although we are not usually consciously aware of doing so. From the critical point of view, the theorist frequently finds that the abstract concepts used by social actors as they go about their daily routine are not adequate descriptions of that society. In particular, the contingency and constructedness of social relations is typically concealed to the social actors living those relations. Those social relations appear as "natural" and therefore outside the power of the social actors to control. For instance, that there is a thing called the "economy" that "grows" frequently appears to social actors within capitalistic societies as natural, similar to how we suppose that unsupported objects will fall. Sociologists sometimes call the social process that conceals the contingency of social relations "naturalization."

Naturalization is a key "strategy" for the maintenance of inherited social relations. To the degree that a society's social relations are unjust, unequal, or exploitive, naturalization conceals the power that some members of society hold over its other members. The critical point of view allows for the identification of these power relations. In particular, the linguistic absence of concepts that describe relationships of domination keeps those relationships outside our awareness. So hidden, those relationships cannot be confronted. To take a critical perspective and generate concepts that describe relationships of domination is a step toward confronting and undoing them.

For example, electrical power companies are frequently described as "natural monopolies," a phrase that explicitly naturalizes the political and social power that these companies hold in society. As I argue in Chapters 3–5, a utility's monopoly is quite artificial, emergent from a suite of laws that confer monopoly status upon a particular corporation. Taking the utility's monopoly as "natural" conceals the system of social relationships that support the operation of the utility and which, in turn, its operations reproduce. The naturalization of the utility's monopoly makes its operations opaque and, consequently, less susceptible to democratic decarbonization.

With this in mind, this book is divided into four parts. In each part, I develop a social theory and then analyze an aspect of contemporary US decarbonization policy from that perspective. Throughout, the development of social theory is aimed at revealing social relationships that, on the one hand, impede decarbonization and, on the other, facilitate the creation of decarbonization opportunities. I do not pretend to know which of these theoretical perspectives is "right." Rather, they are each an offering, which different readers will find more or less useful depending upon their position in the decarbonization effort.

The four theoretical offerings are: environmental economics, a theory of strategic action fields (SAFs) from the sociology of social change, political economy, and a critical theory of race and EJ. An overview of each follows.

1.3.1 *Environmental Economics*

Environmental economics is the incumbent mode of governing climate policy and we begin our inquiry here. The central theoretical concept for environmental economics is "market failure." According to this perspective, when markets work properly, they produce a socially efficient allocation of goods and services. When markets do not produce a socially efficient allocation of goods and services, economists say they have "failed" and might then prescribe policy interventions that "correct" the failure.

For the environmental economist, pollution represents one species of market failure. The harms of pollution fall on individuals and communities who were not a part of the transaction that produced the pollution. The price of the commodity or service exchanged will not, therefore, reflect those harms. Divergence between the market outcomes and the socially efficiency allocation of goods and services will result.

Economists call the policy of pricing pollution so as to realign markets with social efficiency "Pigouvian pricing," after its supposed originator, C. J. Pigou. When applied to greenhouse gas pollution, this policy is called "carbon pricing." Yet where Pigou discusses this idea, he reaches a different conclusion than contemporary environmental economists. Modern economics concludes that pollution ought to be priced, but Pigou indicates that the public ought to pay the polluter for the cost of purchasing abatement. This divergence between Pigou's prescriptions and those of the modern environmental economics is our access point for a critical inquiry into the limits of economic theory for confronting global warming and decarbonizing. In the second half of Chapter 2, we build on this inquiry with an examination of California's Cap-and-Trade program and the Regional Greenhouse Gas Initiative, the two settled US-based systems of carbon pricing.

In Chapter 3, from the economic perspective, we examine how carbon pricing interacts with other market failures prevalent in the discussion of climate policy. These market failures include split incentives, the lack of free entry and exit from markets, and public goods. The objective of this exercise is twofold. First, we present some of the main decarbonization policies that are now settled features of our inherited policy terrain. These polices form a "field" of social action. That field delimits the range of opportunities for decarbonization.

Our second conclusion from the perspective of economic theory is about the adequacy of the concept of the "market failure" for analyzing decarbonization policies and planning courses of action. In this regard, we press the critique that economic theory does not account for power differentials between different social actors or how some social actors use that power to sculpt the social world to their benefit. To segue to social theories that do provide an account of differential social power, we introduce the general concept of "social striation." The notion of social striation acknowledges that individuals are differentially positioned within the social world and that the social world delimits the range of social action available to individuals.

In each of this book's three remaining parts, we develop a different conceptualization of social striation, all with an eye to decarbonization. Our first conceptualization of social striation comes from the sociology of social movements. This discipline asks, under what conditions can and do subaltern populations successfully challenge the status quo to create social change? The central theory we develop is that of SAFs.

1.3.2 *The Sociology of Social Movements: The Theory of SAFs*

A sociology of social movements is relatively new. Responsive to the Civil Rights and protest movements of the 1960s, this discipline emerged only in the early 1970s.[15]

[15] The origin of this discipline is recounted in the introduction of Doug McAdam and Hilary Schaffer Boudet, *Putting Social Movements in Their Place: Explaining Opposition to Energy Projects in the United States, 2000–2005* (New York: Cambridge University Press, 2012).

Prior to this, a structural functionalist approach characterized the few studies of social movements. Under this theory, modern society "was akin to a well-ordered, functional machine, comprised of an interdependent and mutually reinforcing set of institutional parts."[16] From this perspective, social movements arise "on those rare occasions when the normative order has been undermined by rapid social change, prompting those subject to the change processes to engage in a form of reactive collective behavior."[17] Movements then "are but a psychological expression of the underlying strain in society rather than a meaningful response to it."[18] Indeed, Doug McAdam, one of the founders of the discipline, recounts how as an undergraduate (1969–70), he was unable to find any courses on social movement taught by either political science or history departments. Disappointed he would not be able to study his topic of interest, he later stumbled across social movements in a course on abnormal psychology. "Having always seen himself as reasonably well-adjusted, he was surprised … to learn that movement participation was viewed not as a form of rational political behavior but as a reflection of aberrant personality types and irrational forms of 'crowd behavior.'"[19]

In Part II, I rely upon McAdam and Fligstein's 2012 book, *A Theory of Strategic Action Fields*, as a synthesis of the sociology of social movements. From this perspective, the social world is composed of SAFs. Three general types of social actors populate each field: incumbents, challengers, and internal governance units. For the most part, the incumbents of each field are able to manage the field to their longer-term benefit, ensuring that change is incremental and to their benefit. Nonetheless, SAFs are characterized by an ambient turmoil and are susceptible to destabilization. When a field is destabilized, opportunities are rescrambled and the field's challengers might contend for a reordering of field relations. Challengers and their vision might win out, securing a resettlement of the field.

The electrical power company is one of the central social actors in the decarbonization project. The other chapters of Part II present the electrical power company as an incumbent social actor within the electrical power SAF. In Chapter 5, I present a schematic periodization of the development of the electrical power SAF. The operation of the electrical power company is usually concealed behind the notion of "natural monopoly," and in this chapter I show how incumbent utilities have managed the development of field relations to secure their long-term incumbency. The effort here is to demystify the electrical power company and make it "legible" to democratic governance so as to enroll this social actor in the decarbonization effort.

One important theoretical concept introduced in Part II is the "constitutive rules of exchange." In short, constitutive rules are rules that make a particular sort of activity socially recognizable in the first place. They "constitute" the activity. The rules of

[16] Ibid., 11.
[17] Ibid.
[18] Ibid.
[19] Ibid., 4.

games are one example of constitutive rules. Without those rules, the actions of the game would not be possible. Laws are a second type of constitutive rules. They enable certain types of economic exchanges. With this concept ready to hand, I argue that the constitutive rules of the electrical power SAF have been organized around the characteristics of fossil fuels and, consequently, decarbonizing requires a reconfiguration of those rules around the characteristics of zero-carbon energy resources.

The most recent resettlement of the electrical power SAF is New York's Reforming the Energy Vision (REV). Underway since 2012, REV attempts to align the constitutive rules of exchange for the electrical power SAF with the decarbonization imperative. One subargument of this book is that state-level REV-like reforms are essential to meet the decarbonization imperative. Consequently, the whole of Chapter 6 is dedicated to presenting five overarching elements of REV.

1.3.3 *Political Economy*

From the political economy perspective, the inner dynamo of capitalistic societies is the constant accumulation of capital. The central inquiry of Part III, then, is whether the inner dynamo of constant accumulation can be realigned with the decarbonization imperative. The IRA is mostly a spending bill, and its gambit seems to be that capital can, indeed, be greened. After developing the notion of constant accumulation, we introduce the notion of fossil capital, as presented by Andreas Malm in his book of the same name. Malm categorizes the different forms of "natural" energy: that which flows, such as wind, water, and sunshine; that which is animate, such as animals and humans; and that which is buried sunshine, such as coal, petroleum, and methane. Humans harvest each of these energy sources in different ways, and the question of decarbonization hinges on whether the harvesting of the flow can be made into a zone of differential capital accumulation that crowds out investment that extracts hydrocarbons.

The second chapter of Part III (Chapter 8) applies these political economy concepts to analyze the IRA's various tax credits, rebates, and loan guarantees and the Greenhouse Gas Reduction Fund. The question here is, how does this spending reconfigure capital investment toward decarbonization, if at all. Will the IRA's spending code capital accumulation as green?

The IRA also prioritized decarbonization investments in Low-Income and Disadvantaged Communities (LIDACs), and the fourth and last Part examines the IRA's EJ provisions.

1.3.4 *EJ*

Excessive and disproportionate vulnerability to environmental pollution is one of the key concepts of EJ. That excessive and disproportionate vulnerability is, however, not random: It contours along our inherited racialized social striations. Race,

for instance, remains the leading predictor of whether a community is excessively exposed to air pollution. Similarly, in the United States, access to electrical power is nearly ubiquitous, with the notable exception of Native American communities.

To contextualize the racialized distribution of vulnerability to environmental insults, the first chapter of Part IV (Chapter 9) relies upon the notion of dispossession to develop a theory of institutional racism. In this chapter, we focus on the US Constitution's racialized assignment of political power. One of those assignments of political power enhanced the power of the slave states in the federal government, facilitating the dispossession of Black Africans of their labor through the institution of slavery. The other racialized assignment of political power in the US Constitution is the establishment of a "fiscal-military" state aimed at conquering Native American tribes and dispossessing them of their land. This racialized assignments of political power in the Constitution established an inertial social striation – an inherited suite of racialized relationships of domination that will repeat themselves, with modification, unless explicitly confronted.

To focus the presentation of institutional racism, I trace a line through two racialized property relationships prevalent in the decarbonization effort. The first is redlining. In short, redlining designates the federal government's New Deal policy of subsidizing white people's access to home mortgages while denying mortgage subsidies to Black people and other minorities. We might say redlining is the federal policy that racially codes access to capital for homeownership. Among other things, redlining is a proximate explanation of the current vast difference in wealth between white Americans and Black Americans.

The second racialized property relation I trace is "allotment." By the end of the Civil War, the US fiscal-military state had confined Native Americans to reservations. In the 1880s, the federal government set about eliminating Native American culture and assimilating "Indians" to the ways of white people. A part of this effort was the opening of reservations to white colonial property relations. With the Dawes Act of 1887, the federal government allowed for reservation land to be surveyed, divided into lots (hence, allotment), and sold. Through this mechanism, white colonists intruded on reservation land so that, to this day, reservation lands are checker-boarded by a complicated suite of property types and ownership. This complicated property arrangements hinder economic development, including of decarbonization efforts.

In the second of the EJ chapters (Chapter 10), I develop a descriptive model of EJ policy. I originally built this descriptive model for my students. Given the absence of an EJ statute, I found that my EJ lessons had become lists of one racialized exposure to environmental pollution after another, each left unaddressed by the government. The descriptive model aimed to provide students with some general characteristics of EJ policy that they could use for their policy analyses.

The descriptive model of EJ policy has four components, analytically separate but iterative in practice. On this model, the overarching objective of an EJ policy is the confrontation and overcoming of the inertial state of excessive and disproportionate

vulnerability to environmental pollution. The first "step" is the development of a general method to identify overburdened communities. These methods are synoptic epistemologies – ways of knowing – and EJ screening tools are their main modes. EJ screening tools, however, do not provide the granularity needed to make effective policy or program interventions. For this, a method for the identification of the sources and types of pollution is needed, an etiology of environmental pollution, which is the second step. Third, once local sources are identified, an EJ policy channels resources toward the abatement of the pollution. Fourth, as the excessive and disproportionate exposure is but one aspect of institutional racism, EJ policy facilitates capacity building both in communities and in state agencies administering environmental policy. From the point of view of EJ, this capacity building aims at empowering communities to expel environmental pollution from their community and resist further incursion of environmental insults.

During the mid 2010s, after decades of research and patient advocacy, EJ groups started to earn legislative success. One of these is California's Assembly Bill 617, called the Community Air Protection Program, and it serves as the chief example of EJ policy in presenting the descriptive model. After presenting the descriptive model, I apply it to the IRA's EJ programs. The effort in this "application" is neither to prove the model nor to show that the IRA got it right (or wrong). Rather, the IRA's EJ programs and the EPA's implementation of those programs introduce a new suite of social actors to the decarbonization effort. In relying upon the descriptive EJ policy model, I aim to provide a way to conceptualize the relationship between those new social actors and the decarbonization effort.

1.4 STRATEGIC PRESENTATION OF POLICY ANALYSES

One challenge of writing this book is that I was writing about policies whose full contours were being developed by administrative agencies while I was writing. For instance, I wrote the sections on the Greenhouse Gas Reduction Fund in the fall of 2023, but the EPA announced the recipients of all three funds in March 2024. Those recipients commenced their own implementation while this book was in production. These are all important policies, however, and publication could not wait until everything about them was known.

Hence, my strategy for engaging with policies in development was twofold. First, I present social theories that reveal, or aim to reveal, the terrain of decarbonization policy. Readers, then, can use those theories to position developing policies within that terrain. Second, I present the intricacies of a few policies as examples of the many thousands of implementing decisions that agencies, businesses, households, and other social actors must undertake in order to meet the decarbonization imperative. These examples, I hope, shall provide readers with some guidance, or hints, about the sort of other intricacies toward which they might orient their decarbonization efforts.