Overcoming Gridlock: An Analysis of U.S Federalism and Collaborative Leadership within

Climate Change

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Executive Summary

Background

The national policy environment on climate change is primarily set by a global framework published by the United Nations International Panel on Climate Change (IPCC) and acted on by the United Nations Paris Agreement (United Nations, 2023). Its focus is to reach the collective goal of reducing greenhouse gas emissions and improve local communities' resilience against the forces of global warming. Climate change has resulted from a political economy that engages in economic activity that is environmentally unsustainable. It is important to understand that policy in the 21st century needs to reflect that some economic activities are so destructive to the environment that those activities diminish long term economic potential. Current economic models account for this activity as an externality cost. Which is defined plainly as an unaccounted-for cost within economic models (IMF, 2024). Addressing these cost externalities outside of principal cost models leaves the political economy in a vacuum. The largest question driving this issue is, "What is the exact cost of this activity and who is responsible to pay it?" This question leaves policy makers with the responsibility to establish a comprehensive policy model that capture costs, integrate costs into economic models, and implement measures that mitigate future damages and reconcile past damages that will negatively affect economic activity.

In response to national leadership and recognizing the need for action, Governor Murphy passed Executive Orders No. 100 and No. 28, which NJ has used to reduce its impact in contributing to global warming. Executive Order No. 100 and No. 28 sets targets that pursue an 80% emission reduction below 2006 levels by 2050. This emission reduction objective is known as the "80x50" goal. These initiatives include a conversion of energy infrastructure that will be 100% "clean energy" by 2050. Furthermore, the State has passed the Global Warming Response Act (GWRA) to support its New Jersey Energy Master Plan (NJEMP). Authorities were also granted to state organizations to take necessary introductory action via the Solar Act of 2021 and the Clean Energy Act (CEA) of 2023. This legislative background established a comprehensive platform essential to achieving its 80x50 goal. It is important to note that this current framework will need to be expanded on as developments continue within NJ's political economy.

The GWRA report provides an essential review of the current implementation of the NJEMP and provides a quantitative policy pulse as to what programs work and what needs to be improved within the State. The NJEMP and GWRA report deliver the critical review necessary for the State to understand its current energy systems though production, uses, and management in a way that is consistent with future economic, climate, and societal demands. It defines clean energy generation as 100% carbon-neutral by 2050, with maximum electrification of the transportation and construction sectors. The transportation and construction sectors are the largest contributors to Green House Gas (GHG) emissions within the state, followed by electricity generation (State of New Jersey, 2024; NJ DEP, 2022).

New Jersey leadership has recently established a base of legislation that enables local government to take positive action in addressing climate change adaption and mitigation. NJ has passed multiple pieces of legislation such as the Global Warming Response Act of 2007, Solar Act of 2021, and the Clean Energy Act of 2023. These statutes set the stage for New Jersey to take leadership in financing activities as well as providing formal direction for local governments to follow. New Jersey's leadership out of Trenton has allowed for local governments to not only understand the larger landscape of climate change, but also understand how they can adapt their communities to assist in achieving State, National, and Global goals. Climate change is a multi-disciplined complex issue that requires action throughout all economic, academic, and government activity. Therefore, it is paramount that State initiatives are used to guide and support local activity through opening channels of Federal and State funding, as well as providing administrative resources.

Scope

The largest environmental externality that threatens the political economy is from greenhouse gas emissions (GHG). GHGs occur naturally in the atmosphere and are also released into the atmosphere through human activity. GHGs absorb radiation from the sun that is reflected off the earth's surface. The most common GHGs are carbon dioxide (CO_2) and methane (CH_4). When GHG concentrations are in balance it allows the planet's ecosystems to remain sustainable to support human economic activity. However, if GHG concentrations fall out of balance it causes effects within ecosystems that create instabilities, which pose a threat to national economic interests and national security. The best basis for policy makers to frame there understanding on

developing comprehensive political economic models to combat this issue is to understand the relationship of GHG to Gross Domestic Product (GDP). GHG concentrations on the planet are influenced by sources and sinks. The primary sources of GHG emissions include manufacturing, construction, energy supply, transportation, agriculture, and waste management. The primary natural sinks for GHG are the ocean, forests, and soil. If the GHG expenditure is greater than the collection capacity of sinks the current economic activity is unsustainable and carries a premium for over consumption. If increase in GDP growth outpaces efficiency of GHG use for economic activity climate change will progressively reach destabilizing levels effecting future economic efficiencies (IPCC , 2023).

To achieve the 100% clean energy goals within NJ's aims there needs to be comprehensive reforms and bold action in a space that has been historically difficult to significantly influence. NJ needs to foster the rapid acceptance of electric vehicles, electrification of commercial and residential heating ventilation and cooling (HVAC) systems/ decarbonization in construction methods, and elimination fossil fuels in electricity generation. The NJEMP and GWRA report present two common problems within clean energy sourcing, EV adoption, and green building initiatives. They demand timely action to achieve their goals and require robust support in public opinion and end-users. The GWRA 80x50 report acknowledges that the current framework in place offers a noteworthy start for the green economy transition, but at best leave the state missing its 2050 target by a magnitude of 300% (NJ, 2020). Moreover, the report asserts that significant emission reduction will not decrease without additional policy adoption that builds upon the current framework. There is an obvious demand for continued leadership that sponsors extensive deployment of alternative clean energy technologies and clean economy processes (Barr, et al., 2020). t

To achieve NJ's 100% clean energy goal and the GWRA 80x50 goal NJ must focus its principal effort in clean energy generation, clean energy transportation, and climate change education. New Jersey has recently positioned itself to receive $156 million through the EPA's Solar for All program, offer $80 million through the New Jersey Economic Development Authority's (NJDEA) NJ Clean Energy Loans (NJCEL) program and received $364 million of broader funding from the Regional Greenhouse Gas Initiative (RGGI) to support its goals (EPA, 2024) (State of New Jersey,

2024) (RGGI Inc, 2024). NJ has also engaged in educational programs that give a base of knowledge for current and future societal participants.

Federal Regulatory Review

Critical Federal Regulation

Multiple legislative works have been passed to advance the United States capabilities in regulating environmentally destabilizing economic activity. The Clean Air Act (1990), Clean Water Act (1972), National Environmental Policy Act (1970), the Comprehensive Environment Response, Compensation and Liability Act (1980), and the Inflation Reduction Act (2022).

The Clean Air Act (1990) addresses topics of climate change, ozone conservation, air visibility, acid rain, air pollution, and air quality. It allows for the regulation of emissions at all sources of economic activity and is aimed to promote the health and welfare of citizens. The Clean Air Act (CAA) commissions government regulatory activity through establishing authority of permit issuance for operation and develops enforcement authority in overseeing the production of hazardous air pollutant quantities. This has improved air quality and reduced a significant amounts of carbon dioxide released per vehicle. However, the criticism of this legislation is that it does not go far enough to combat the volume of fossil fuel powered vehicles on the road that emit CO_2 (EPA, 2024) (BOEM, 2024). The Clean Water Act (CWA) establishes the basis of forming regulation that monitors the release of pollutants into surface waters at point sources and non-point sources within industry. This legislation is important in maintaining water quality that supports habitats of animals that contribute to the ecosystem's carbon sinks such as forests and wetlands (EPA, 2024).

The National Environmental Policy Act (NEPA) is a power piece of legislation that covers a range of activities that requires all public and private entities to assess the environmental consequences of their actions before they begin conducting any action. This legislation covers the use of permit application, adopting federal land management action, and include constructing highways and publicly owned facilities. This legislation serves to ensure that detailed assessments are conducted which are commonly referred to as Environmental Impact Statements and Environmental Assessments (EPA, 2024). NEPA has been used to support information driven decision-making when it comes to undertaking projects that are resilient to natural disasters, which is in-line with

the US strategy to climate change resilience strategies. NEPA also served as the first step in the US legislative action taken that incorporated environmental, economic, and social concerns to drive modern policy development (Council on Environmental Quality, 2024).

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) is known as the Superfund legislation that gives the federal government authority to respond to hazardous substances released into the environment. Though this fund federally currently does not employ direct action against climate change at the federal level, many state governments are using its framework to model their own "polluter pays principle" legislation. This is important because if adopted it will allow for economic participants that are fossil fuel user to be responsible for the non-source and source point GHG emissions they release into the atmosphere. This can be critical to implementing comprehensive policy that removes externalities from economic models and incorporates the use of fossil fuels into the cost structure of producers. The premium of these additional costs can reduce demand to sustainable alternatives as well as generate funding in models for mitigation solutions (Peter H. Howard & Xu, Ph.D, 2022).

The Inflation Reduction Act (2022) was one of the largest investments conducted by the American government geared toward energy security, climate mitigation and adaptation funding, and the economy. It looks to utilize tax incentives to spur investment in clean energy and manufacturing. It also takes into consideration the need for US policy to create and support for early adopters of technology and methods markets that generate environmentally sustainable economic models to significantly materialize change (Department of the Treasury, 2024).   The bill contained $400 billion in spending and tax breaks that is aimed to substantially lower the nations carbon emission by 2030 to align with US strategic decarbonization reductions. It focuses on developing decarbonization pathways through supply chains, emerging technologies, policy innovations, workforce training, and metric development. This is a critical bill in providing the initial kickstart to drive sustainable economic activity that will prevent detrimental to long term impacts to economic longevity (McKinsey & Company, 2022).

State Policy Review

Critical State Legislation and Programs

New Jersey currently utilizes state and regional programs to accomplish its clean energy targets. The most significant initiatives are the Regional Greenhouse Gas Initiative (RGGI) and the New Jersey Clean Energy Program (NJCEP). The RGGI collaborative is a market-based solution among states within the northeast region. It uses a cap-and-trade system, which caps emission allotments and issues permits that influences the power sector to reduce its CO2 emissions. Moreover, this initiative represents the first cap-and-invest regional program in the United States (RGGI, Inc , 2023). New Jersey's other notable initiative, NJCEP, utilizes the New Jersey Board of Public Utilities (NJBPU) to administer the Successor Solar Incentive (SuSI) Program. Under the authority of the Clean Energy Act of 2018 and Solar Act of 2021, the SuSI program provides incentives that enable solar energy development throughout the state (NJBPU, 2022). SuSI serves as the umbrella program for the Administratively Determined Incentive (ADI) and the Competitive Solar Incentive (CSI). These programs work alongside NJCEP's SREC Registration Program (SRP) to foster decentralized clean energy throughout the State.

RGGI

RGGI uses individual CO2 Budget Trading Programs (BTP) within sponsored states. Through independent state regulations, each state issues CO2 allowances and participates in regional CO2 allowance auctions. Additionally, allowances can be bought and sold through secondary markets between permit owners after initial state auctions. States are also encouraged to reinvest its auction proceeds toward consumer benefit programs that improve the adoption of renewable energy technologies. Generally, RGGI proceeds have been used to benefit local businesses, low-income neighborhoods, industrial parks, and individual homes throughout the region (RGGI, Inc , 2023).

New Jersey has utilized $187.2 million from RGGI proceeds from 2020 through 2022 to fund strategic initiatives within the State. These funding initiatives include catalyzing clean and equitable transportation ($162.8M); promoting blue carbon in coastal habitats ($16.8M); and enhancing forests and urban forests ($6.7M). This was achieved through the administrative action of NJ Board of Public Utilities, NJ Department of Environmental Protection, and NJ Economic Development Authority (NJ EDA, 2022; NJ DEP, 2022). This program presents an excellent political economic model that captures the supply-side GHG emission externality, while generating financing opportunities that fosters investment through proper public action channels. Supply-side GHG emission externalities are created from carbon inefficient energy production

from producers. Demand-side GHG emission externality is created from carbon inefficient sourcing demands and excess consumption behavior. Addressing the externality from both ends streamlines decarbonization within energy supply chains. When considering what establishes a comprehensive clean energy policy, this is a vital mechanism to incorporate within the clean energy investment policy prescription. It is also important to recognize the less government intervention is involved in establishing competitive market solutions to address correcting these externalities the more efficient the solution will be.

Administratively Determined Incentive (ADI)

The Administratively Determined Incentive (ADI) Program provides an administratively set incentive value for net-metered residential projects, non-residential projects, and community solar projects under 5 Megawatt Hours (MWh) or 5,000 kilowatt hours (kWh). Instrumental to this program is the use of the Solar Renewable Energy Credit- II (SREC-II). The SREC-II is a clean energy credit that is a tradable credential used for indicating conformity with the NJ Utility Renewable Portfolio Standard (RPS). RPS requires 35% of the energy sold in the State comes from qualifying energy sources by 2025 and 50% by 2030. Producers of 1000 kWh receive one SREC, which is offered independently of net-metering benefits offered to customers. Net-metering credits customers with solar systems or other renewable energy generators that reduce demand during the monthly billing cycle with any excess generation being credited at retail rates on the following month's bill. This is a great platform for fostering strategic source diversification within energy grids and employ clean energy production. However, the economics that support this program require a capacity block, which limits solar energy investment to maintain the SREC market. It is important to note that this program does provide adequate opportunity for early adopters, however, it restricts the rapid adoption over the long-run that is required within the 80x50 goal.

Community Solar Energy Program (CSEP)/ Competitive Solar Incentive (CSI)

The Community Solar Energy Program (CSEP) operates within ADI and follows similar program principals. The variation of programs is the integration of community solar investment strategies such as: rooftops; carports and canopies; floating solar; contaminated sites and landfills. Moreover, cap limits are controlled by electric distribution companies. Once the company reaches its MWh limit it closes its registration for program applicants (NJBPU, 2023). This program

increases the advancement of community solar projects but runs similar long-rung risks associated with capping investment opportunity, similar to ADI. The CSI program is also guided by similar models used in the ADI program. The deviation between initiatives is the focus on larger solar facilities within the SuSI portfolio. CSI is open to eligible solar facilities that support the grid through non-residential net-metered solar installations. The installation needs to have capability that exceeds five megawatts and can provide energy delivery/ storage. It utilizes 5 tranches within its application process that is applied to a range of clean energy solutions. The tranches are broken into basic grid supply, built environment grid supply, contaminated site grid supply, non-residential net-metering applications, and storage applications (NJBPU, 2023). This program is important for its surgical application of targeting otherwise overlooked opportunities of investment in clean energy applications. Conversely, it runs into the principal economic long-run issues of capped investment opportunities due to administrative restrictions.

Green Bank (Green Fund)

The New Jersey Economic Development Authority (NJEDA) has been exploring the opportunities associated with establishing a Green Fund. The NJEMP states that this fund will look to mobilize strategic funding initiatives similar to the activity conducted under RGGI. The fund will reduce GHGs and promote a clean energy through providing necessary capital to proven clean energy technologies with less restrictive loan provisions. The Green Fund will follow the green bank model in other states and will specifically work on projects that are cost effective through the use private/ public funding. Moreover, The Green Fund will help leverage loan programs for small contractors to access the resources they need to compete for projects in New Jersey's clean energy space and allow contractors to undertake retrofit work without waiting for "performance periods" under pay for performance programs. This greater access to capital will assist in rapid energy efficient building construction (NJEDA, 2023). This approach fosters a nearly fully private economic solution in support of competitive market solutions, while developing investment expertise within the clean energy economy. These are the vital components in sustainable economy stewardship that the government should be facilitating. The employment of a Green Fund is well aligned with both the initial stewardship of markets that can keep pace with the 80x50 report expansion requirements.

<p align="center">**Local Implementation Cases**</p>

Local Policy Action Review

3 local municipality actions will be highlighted within this review of local steps taken to support the framework provided by NJ to support clean energy initiatives and electric vehicle infrastructure development. Review will conclude with a climate change education campaign conducted by Rutgers Climate & Energy Institute. New Brunswick and Trenton have been implementing investment opportunity plans to engage in solar projects and EV initiatives. Jersey City have taken charge in improving EV infrastructure through public charging station installations and updating local ordinances to support EV adoption. Lastly, the Rutgers Climate & Energy Institute has developed education training resources for teachers to integrate within their curriculums.

New Brunswick and Trenton

New Brunswick incorporated spending plans within its budget to use public funds that are focused on using solar panels on top of public structures such as schools, district offices, and Adult Learning Centers. They are looking to expand their city investment plans to include community solar projects that will allow residents to tap into solar panel energy sources located on carports and other public spaces. Currently, their solar energy infrastructure reduces local grid burden through over 8 public instillations (City of New Brunswick, 2024). The City of Trenton has published a Sustainable Design Guidelines and Rating System. It currently expresses the demand for photovoltaics within building construction amongst climate resiliency designs. However, the city has not specifically published explicit plans to integrate solar panel instillation within their city plans but have listed plans for incorporating EV charging stations (City of Trenton). Within both cities there is no public information available that explicitly states participation in New Jersey's Clean Energy Programs (NJCSEP) CSEP, CSI, or ADI. Exploring administrative and community engagement opportunities through these state initiatives could strengthen their commitment to their initiatives of cleaning their energy portfolio.

Jersey City

Jersey City has taken public measures to improving its vehicle fleet through deploying public EVs for municipal use and waste management services. It stated that it has utilized grants to add 37 electric vehicles to the city's municipal fleet and built 27 charging stations at locations throughout the city. The funding came from NJDEP that is a categorical grant focused on removing diesel

trucks. The city was also able to secure an additional $1 million dollars from the DEP for its EV charging initiative. The city has stated that it is committed to further aligning its planning through the 2021 Jersey City Climate and Energy Action Plan to meet the goals outlined in the NJ Energy Master Plan and the GWRA 80x50 report (Jersey City, 2023). This initiative is certainly a positive step in the right direction, however, to meet the claim as, "the National Alternative Energy Leader" the city can make larger investment initiatives through accessing state funds outlined in NJDEA Clean Energy Loans and utilize partnerships with LEED and NJSBI to integrate more comprehensive sustainable city designs.

Policy Conclusion

The US policy environment directed at addressing climate change is supported by a legislative basis that has two principal functions. The first function is to define the environmental standards that foster sustainable economic activities and enforce methods of sustainable activity. The second function is to address market failings that don't account for costs associated with ignoring fundamental environmental processes that can destabilize the economy as whole if left uncorrected. This legislative basis is crucial for a policy environment that can leverage all levels of government to implement climate change polices from the national to local level. The federal government has set forth overarching climate goals, however, it is up to states and local governments for implementing the policies required to meet national commitments of the Paris Climate Agreement. The most promising solutions involve fostering competitive market solutions that allow for economic forces to employ new technologies and practices efficiently across all sectors of the economy. It is also crucial that the policy environment ensures regulation that employes climate change adaptation and mitigation strategies across all actors of the political economy.

This requirement requires coordination not only across government organizations in different sectors of the economy, but also bilaterally within different levels of government. Therefor the planning to achieve this goal needs to come directly from a central location within the Federal government that other agencies will meet to support through specialized initiatives at all levels of government. There needs to be a reliance on government relationships and modifications to bureaucracies within this space that can be determined as prohibitive to progress. Leadership on this issue is paramount for working between agencies, levels of government, varying academic

fields, and key private partnerships. Deliberate efforts must be made of the government to review the administrative capacities and efficacy of the systems in place to ensure funds and energy are being used as efficiently as possible to address the urgency required to reduce negative effects. Being that this issue is so comprehensive and requires multi-level government support it is important that this remains a partisan issue. As this solution needs continual and progressive support it is important that bureaucratic channels are emplaced placed to overcome prohibitive bi-partisan politics.

New Jersey must focus on capturing supply side and demand side externalities in current market designs that contribute to the overconsumption of GHGs. New Jersey has shown that it can implement policies, which can readily support local communities to take action that have global impact. What is critical is that it makes these programs known and available to local municipalities and businesses. Moreover, it is imperative that all policy initiatives are supported by policy framework principals found within RGGI and NJEDA's Green fund. These principals incentivize decarbonization within economic activity through recognizing costs of carbon sourced energy and re-directs capital to sustainable energy technologies and practices. Wide reaching policy initiatives that can be implemented at the State level to support local action to meet national GHG reduction goals is the implementation of carbon sourced utility taxes and carbon sourced value added taxes. These taxes can support policy mechanics like RGGI and NJEDA's Green fund. The revenue from this broad instrument can support program expansion for local municipalities and businesses to engage in clean energy technology solutions while disincentivizing carbon-based energy use.

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