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A BETTER NEW ENGLAND REGULATORY FRAMEWORK FOR MITIGATING CLIMATE CHANGE

A preliminary research report to inform stakeholder workshops in all New England states

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Synapse Energy Economics, Inc.

Preface

Dear Workshop Participants,

The questions you are looking at, based on the Brown University/Synapse/Climable assessment, are pragmatic. In my view this is a high compliment: pragmatism is an out-growth of the thinking of two New Englanders, Ralph Waldo Emerson and John Dewey. Pragmatism privileges practical reality and what works. The enormous importance and critical timeliness of the work you are undertaking is a function of its context: climate change issues must be addressed tangibly now and public utility commissions have a key role in having this happen.

Yet public utility commissions are essentially new to this kind of work.

Public utility commissions are a product of the Progressive era—think of Teddy Roosevelt and Woodrow Wilson. Think of the need to get a handle on geographically based monopolies, electricity, wires-based telephone systems, trolleys, and drinking water supplies. Public utility commissions were set up as quasi-judicial entities, and as they evolved rate-making was a core concern. Their formation during the second industrial revolution was driven by electrification and internal combustion engines, which together shaped the modern life of the twentieth century. The operating paradigm in the second industrial revolution was centralized/concentrated production of a good or service, and then distribution on a "one-way street" out to the end consumer. Consumers paid the bill. The function of these commissions was to assure reliability and continuing viability of the utility service, with rates that were adequate and affordable to consumers. In fact, the impacts on consumers were established as a primary concern, with great sensitivity to near-term rate increases. Short-term thinking became nearly predominant.

But we are now in the third industrial revolution, the digital age of "information and communication" (Robert Gordan's definition) characterized by its pivotal years from 1994–2004. Now smart grids are possible, two-way flows to and from consumers are readily facilitated, and distributed generation can be accommodated (and in some instances can alleviate the need for additional electrical distribution capacity).

The period 1990 through 2015 was also a time of a profound shift in electrical generation capacity from nuclear power, oil, and coal being dominant to natural gas meeting more than half of the generating capacity need. This brought power plant emissions down, especially from coal-fired plants. But natural gas is a fossil fuel, and it too must be retired if greenhouse gas emission reduction goals are to be met.

The shift away from natural gas could well involve fundamental systems change. Such a shift could be characterized as fracturing the "equilibrium" of the energy system that evolved during the fossil fuel era. A new equilibrium, with net zero greenhouse gas emissions, needs to be achieved.

For public utility commissions, development of the new equilibrium—with its own processes of continuing evolution—could in effect constitute regime change. This would be a sharp movement from

the second industrial revolution basis of thought into a new one organized on third industrial revolution capabilities.

This is the challenge now faced by New England, a region that for a good century or so has considered energy issues on a regional basis. The early 1970s saw the organization of the New England Power Pool Generation Information System (NEPOOL GIS). ISO-New England came into being the latter 1990s to run the electrical grid, and it began functioning as a "regional transmission organization" in 2005.

Yet in key respects, there isn't one New England: there are three. First, there is a northern New England of rural poverty, especially in Maine. Second is the New England of old industrial cities which no longer have a powerful and vibrant manufacturing base, and which now have diverse immigrant populations. And third, there are the knowledge economy and financial powerhouses of the Boston and the New York metropolitan areas. At the street level, it often appears that these three New Englands understand each other little and communicate with each other almost not at all. Each has its own tempo of daily life and value systems. The latter of the three is immensely rich and powerful, even by global standards.

This reality, such as it is, makes the issue of environmental justice much more than something to be defined primarily as procedural fairness. Substantive fairness and equity are basic issues, as are identity and the reality of different communities; these must be recognized and honored and a full respect for their agency must be established.

Public utilities commissions have their own distinct political culture. They are comfortable dealing with the entities they regulate: utilities. They speak the same language. In many respects, this is a natural outcome and a good thing. But it can also anchor thought and decision-making processes in the present.

Law professors Brooks, Jones, and Virginia in their classic book *Law and Ecology* observe how fundamentally different ecology and environmental law and policy are. The former seeks to understand interdependencies in nature, while the latter is pragmatic and built on incremental decisions by courts, legislatures, and agencies. The professors ask: "*How can these two very different disciplines be joined within one ecosystem regime*" (page 365).

The questions posed by the Brown University/Synapse/Climable assessment, at their core, ask you to participate in this joining of disciplines, and do this in a context that faces climate change realities. The report and these workshops are much needed; they provide us a rare opportunity to bring a range of voices to this transformative task of building a new equilibrium with net zero greenhouse gas emissions. Yours is exciting work!

With best wishes,

Kenneth F. Payne, President
Civic Alliance for a Cooler Rhode Island

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Executive Summary

Climate change is no longer a concept, relegated to a future generation to solve or deal with. The costs of climate change due to damaged property, resources, and lives from increasingly volatile and severe weather are a significant annual impact. A remarkable amount of change is needed to avoid rapidly approaching and irreversible tipping points. However, the inertia of institutional and cultural norms and practices from a previous era – especially among energy regulators - are powerful in counteracting the dedication, mobilization, and coordination required to affect this change.

Climate action by New England states has recently ramped up, but it remains far short of efforts needed to achieve their 2030 goals. One key difficulty lies in the mandates of the public utility commissions (PUC)[1] that regulate the electricity and gas utilities of each state. Many of these PUC missions —as set forth by the legislatures— do not explicitly address climate change. Or in practice, the missions treat meeting climate goals as secondary to reliable and affordable energy provision. As a result, many PUCs have not been explicitly given the authority or directive to address climate change, nor are they held responsible for not addressing it. Because of this, states may be missing key opportunities to reduce greenhouse gas emissions and address the impacts of a destabilized climate system.

Brown University engaged Synapse Energy Economics and Climable to embark on a collaborative, public effort to assist New England states in identifying roadblocks to climate action and brainstorming ways to overcome them. The effort includes this background report which summarizes research to inform stakeholders about barriers, opportunities, and best practices around the region. The team will then support a series of public workshops in all New England states that are designed to gather stakeholder input and facilitate collaboration on solutions. A final report of the project will commemorate lessons learned, action items, and next steps from the workshops.

> No state is on track to achieve its 2030 greenhouse gas emission reduction targets.

Based on our background research, we identify and characterize four key areas of best practice including: (1) clarity and transparency in climate legislation, (2) PUC authority, (3) promoting equity and environmental justice, and (4) strengthening interdepartmental and interagency collaboration. Table ES-1 on the following page provides an overview of state progress on specific best practices related to each area, which we describe in more detail in the full report.

We find:

- Many states (Connecticut, Maine, Massachusetts, Rhode Island, and Vermont) have legislative mandates across all sectors of the economy to address climate change though greenhouse gas emission reduction targets. Other supportive policies include the Renewable Portfolio Standards requirements, energy efficiency savings targets, and energy storage procurement targets. No state is on track to achieve its 2030 greenhouse gas emission reduction targets.
- Many states (Connecticut, Maine, Rhode Island, and Vermont) have formed councils for coordination of climate change mitigation efforts between their local state agencies and other relevant stakeholders. However,

Table ES-1. Summary of Climate Action Best Practices in New England States

Best Practice	CT	ME	MA	NH	RI	VT
Setting and achieving economy-wide, legally binding greenhouse gas emission reduction targets and other supportive policies	◑	◑	◑	○	◑	◑
Requiring PUC to address climate change in its mission and decision-making	○	●	●	○	○	○
Enacting environmental justice legislation and policies and defining environmental justice	○	●	●	○	◑	○
Establishing a Climate Change Coordinating Council and collaborating on action	●	●	○	○	◑	●

Legend: ● = achieving best practice; ◑ = partially achieving best practice; ○ = not achieving best practice

questions remain about the performance of these councils. Organizational structures where PUCs, energy offices, and environmental offices report directly to state departments of environmental protection or an executive office related to energy and the environment have proven successful at aligning goals and progress.

- Some states (Connecticut, Maine, and Massachusetts) have established environmental justice legislation, policies, and definitions. Maine and New Hampshire offer financial assistance for stakeholder participation. No states offer translation services. Only one state (Connecticut) requires consideration of convenient meeting times for stakeholders.
- A few states (Maine and Massachusetts) have clear PUC mandates to consider climate change impacts in their decision-making processes and identify these mandates in their mission statements. No states have penalties for PUC non-compliance with goals.

We also identify and characterize barriers, including but not limited to:

1. lack of a clear legal mandate for the PUC to address greenhouse gas emissions;
2. no accountability for PUC non-compliance of legal mandates;
3. lack of funding to support implementation of climate policies;
4. leadership changes and instability;
5. inequitable Environmental Justice participation in the regulatory process;
6. insufficient coordination with and between state agencies; and
7. lobbying, conflicts of interest, and/or utility control issues.

Table ES-2 highlights some of the barriers to climate action that New England states face.

Table ES-2. Barriers to Climate Action in New England

Barrier	CT	ME	MA	NH	RI	VT
Lack of a Clear Legal Mandate for the PUC	Y			Y	Y	Y
No Accountability for PUC Non-Compliance	Y	Y	Y	Y	Y	Y
Lack of Funding and Capacity					Y	Y
Leadership Changes and Inconsistencies				Y		
Inequitable Environmental Justice Participation	Y	Y	Y	Y	Y	Y
Insufficient Coordination with and between State Agencies			Y	Y	Y	
Lobbying, Conflicts of Interest, and/or Utility Control Issues	Y	Y	Y			

We find:

- States without a PUC mandate and/or penalties for non-compliance may be suffering from a reluctance to act on climate change. Only two states, Maine and Massachusetts, have mandates for their PUCs in place.
- Official climate coordinating councils could facilitate necessary interaction between decision-makers and stakeholders; however, their performance is in question at this time.
- Excessive influence by utilities, conflicts of interest, and lobbying against climate initiatives and programs across several New England states appear to be impeding clean energy and climate progress in many cases.
- Inequitable participation by environmental justice communities is broadly relevant. Some states do not have environmental justice policies and/or definitions. Only Maine and New Hampshire offer financial assistance to stakeholders for participation in events. No translation services are offered in any state. Only Connecticut attempts to hold meetings at convenient times.
- Two states, Vermont and Rhode Island, report a lack of funding to support climate policy implementation. However, other states may be experiencing similar issues, as limited capacity is often mentioned in the smaller states.
- Only one state reports experiencing issues with leadership changes and instability; however, other states may experience similar issues.

Figure ES-3. Climate Action Decision-Makers and Stakeholders and their Interaction

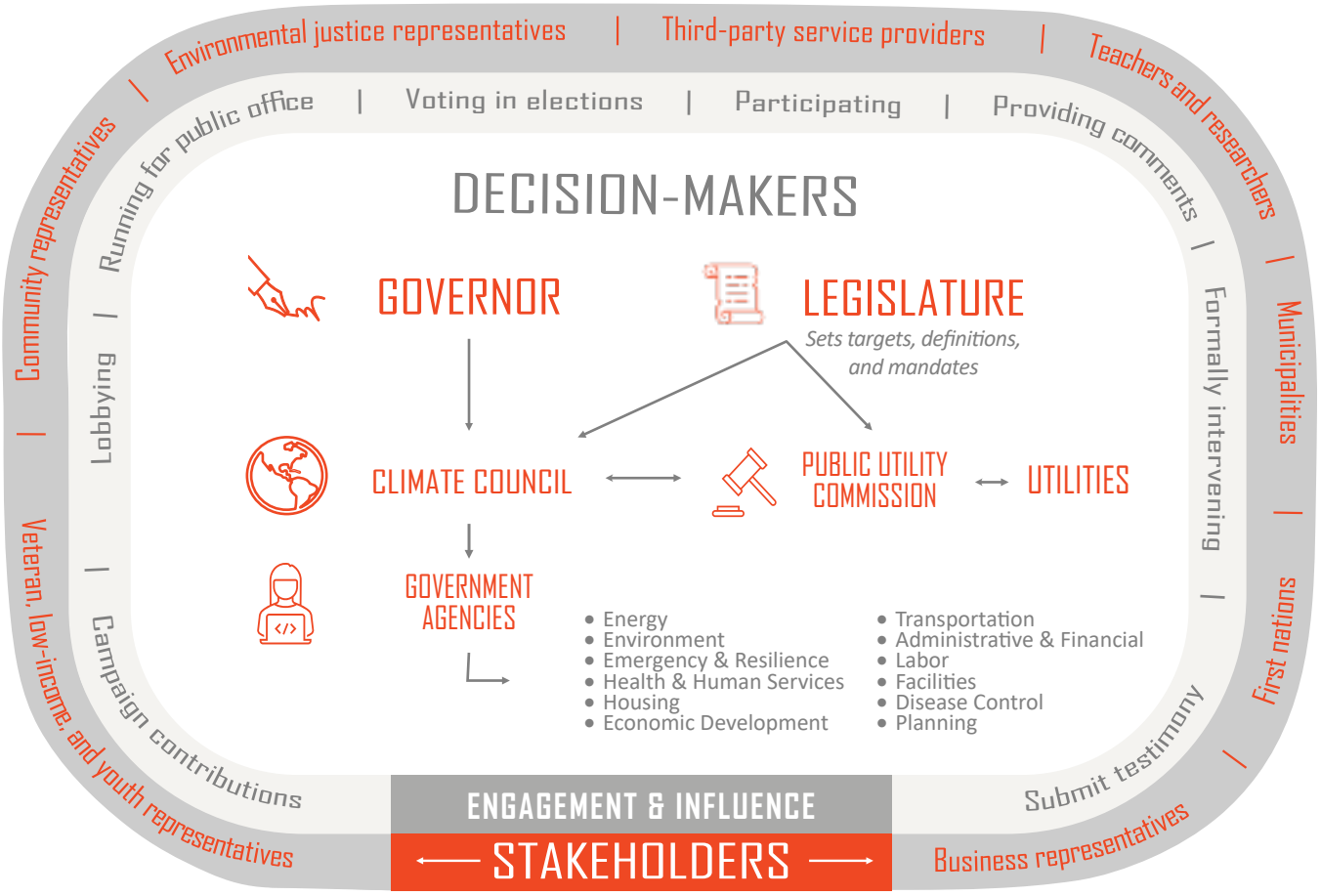

Figure ES-3 provides an overview of the types of decision-makers and stakeholders involved in climate action in New England states. Within the internal circle labeled Decision-Makers, we find:

- The Governor, which forms the climate council in states with a climate council and runs the local government agencies and the climate council;
- The Legislature, which sets the climate targets and mandates for the climate council and PUC;
- The Climate Council (in states where one exists), which is comprised of government agencies, the PUC, and other types of stakeholders which appear in the outer circle;
- The state's Investor-Owned Utilities, which report to the PUC; and,
- Stakeholders, who can engage with and influence decision-makers by lobbying, providing campaign contributions, running for public office, voting in elections, participating in hearings, workshops, and technical conferences, providing comments, formally intervening, and/or submitting testimony.

In summary, each New England state can improve, though some more than others. The research raises key questions. Stakeholder workshops in each New England state in 2022 will provide the opportunity for further discussion and action. We encourage stakeholders to consider these questions in advance of the workshops and come ready to actively participate.

Key questions for further consideration and discussion include:

1. What does "meaningful and equitable climate action" mean? How should we define it? How should we measure it?
2. What are the characteristics of strong climate policies and programs? What policies and programs need to be in place to support the development of equitable utility regulation and climate action in each New England state?
3. What are the most impactful steps that states can take in the near term? What steps are more difficult and/or time consuming to accomplish and why?
4. Are these steps equitable? If not, how do we make them equitable?
5. What needs to be done to enforce policies and practices? Are penalties appropriate and if so, what types?
6. How do we address issues of lobbying, conflicts of interest, and utility influence?
7. How important are climate councils in ensuring meaningful progress is made? Do they have enough authority to make progress? What barriers do they face?
8. What are the key barriers to getting different kinds of stakeholders involved in the development of meaningful and equitable climate policy? What characterizes effective stakeholder engagement in the case of PUCs?

Introduction

Since the 1980s, when leading climate scientists began to publicly advocate for sharp greenhouse gas emission reductions to combat climate change, progress towards reducing emissions has been slow. The pace has picked up in recent years as legislatures in most New England states have passed ambitious targets for reducing their greenhouse gas emissions. Several states have established climate councils comprised of many government agencies to coordinate and find cost-effective ways to achieve these targets. A key focus for every state is the energy sector. Electric and natural gas investor-owned utilities are central players in climate and clean energy efforts, given their major role in the production of greenhouse gas emissions. While states have set targets for the renewable energy share of electricity sources (called Renewable Energy Standards or Renewable Portfolio Standards), they are not achieving their broader emission reduction targets. What explains this difficulty? It is crucial at this key moment to investigate institutional and regulatory barriers to achieving state climate goals.

One key difficulty lies in the mandates of the states' public utility commissions (PUC)[2] that regulate the electricity and gas utilities. Many of these PUCs' missions, as set forth by the legislatures, are focused on affordable and reliable energy and do not explicitly address climate change. However, climate change is no longer the fate and responsibility of future generations. The annual costs of climate change due to damaged property, resources, and lives from extreme and less predictable weather events are substantial. Energy regulator dedication, mobilization, and coordination to affect change is hampered by the inertia of institutional and cultural norms and practices from a different era.

Brown University teamed up with Synapse Energy Economics and Climable for a collaborative, public effort to help New England states identify roadblocks to climate action and then brainstorm ways to overcome them. The team created this initial report with background research to feed into stakeholder discussions about areas of progress, barriers, and opportunities through a series of public workshops throughout New England. Those stakeholder workshops will serve as the basis for a final report detailing lessons learned, action items, and next steps. Many of those next steps may require new legislation, agencies, or task forces, and so we seek to convene the appropriate stakeholders to look beyond the status quo to discover meaningful and equitable solutions—solutions that may be beyond the scope of any one individual or group.

The purpose of this report is to summarize our background research to develop and support the upcoming workshops. The background research includes summaries of each New England state's climate actions and barriers, and best practices from across New England. We categorize the best practices as:

- Clarity and Transparency in Climate Legislation
- Public Utility Commission Authority
- Promoting Equity and Environmental Justice
- Strengthening Interdepartmental and Interagency Coordination

We describe each best practice in more detail below and provide examples from other states across the country. We also identify barriers and provide examples of how states can address them.

Clarity and Transparency in Climate Legislation

Policies must have clear targets to be effective. For states to successfully and equitably reduce greenhouse gas emissions, lawmakers should pass climate legislation which has specific, measurable, and time-bound binding targets that can be revised as necessary based on evolving scientific consensus on climate change.

States also need a transparent process in place for measuring, reporting, and verifying whether utilities and states are on track for achieving the specified climate targets. Transparent data and analysis help address these issues and reduce the burden on intervenors and other stakeholders to access the information and understand the effectiveness of various solutions at achieving the goals. Utilities traditionally do not provide this information unless required, which prevents transparency and can increase public mistrust. Transparency could be promoted by making greenhouse gas emission measurements publicly available on a website, providing the utility data online for public viewing and analysis, or having a neutral third party have access to utility data to conduct an independent and public energy and emissions assessment. For example, the New York Department of Public Service issues an annual "State of Storage" report on progress towards the statewide goal of 3,000 megawatts (MW) storage by 2030.[3]

Finally, it is important to ensure compliance with the specific and time-bound clean energy targets. Compliance will need to be encouraged with incentives or enforced with penalties.

PUC Authority

The actions that PUCs can take to address climate change are largely subject to what they are allowed to do under state law. Also, when mandates are applied to the entire economy, PUCs and utilities sometimes struggle to identify what the utility role is relative to other sectors. PUCs will be more effective at addressing climate change if state legislatures mandate that their PUCs consider climate change in their decisions and direct their PUC to take efforts to mitigate it as part of their primary responsibilities. For example:

- New York State amended its state energy plan in 2019 to require the Public Service Commission to implement the clean energy program and technology goals stipulated in the *Climate Leadership and Community Protection Act*.[4]
- Michigan directed its PUC to ensure that state-owned facilities use 100 percent renewable energy by 2025.[5]
- Washington D.C.'s 2019 *Clean Energy Omnibus Act* has a specific provision for the Public Service Commission to consider "the preservation of environmental quality, including effects on global climate change and the district's public climate commitments."[6]

Additionally, some PUCs are currently developing social costs of greenhouse gas emissions. Consideration of social costs is key to internalizing the externalities of climate change and environmental degradation. For example:

- Washington's *Clean Energy Action Plan* (RCW 80.29.405) requires the Commission to establish a social cost of carbon and to incorporate the cost into regulatory impact analysis.[7]
- In Oregon, the Commission has begun work focusing on incorporating the costs of greenhouse gas emissions into long-term planning processes for its regulated utilities.

Promoting Equity and Environmental Justice

There are a variety of actions that both state legislatures and PUCs can take to make climate and energy policies more equitable. The first step is to adopt a legal definition of environmental justice. Ideally, a federal definition would allow for environmental justice progress comparisons across states and regions. However, in the absence of an adequate federal definition, a state definition allows for in-state progress reports on environmental justice initiatives. It also enables PUCs to instruct utilities to explicitly consider environmental and energy equity issues in their project proposals. Lack of a definition creates ambiguity, which often leads to inaction.

States across the United States are addressing equity in their climate and energy policies. For example:

- Washington's 2019 *Clean Energy Transformation Act* (SB 5116) charges the PUC with "[e]nsuring that all customers are benefiting from the transition to clean energy…[t]hrough the equitable distribution of energy and non-energy benefits and the reduction of burdens to vulnerable populations and highly impacted communities."[8]
- Oregon's 2020 executive order (E.O. No. 20-04) required the PUC to conduct stakeholder outreach and to develop interagency workplans, with a focus on climate-burdened communities, to achieve them.[9] The Oregon Senate also passed the *Oregon Energy Affordability Act* (HB 2475), which authorizes the PUC to consider differential energy burden and other inequities of affordability in rates.[10] More specifically, it authorizes the PUC to allow utilities to provide rate discounts for low-income or other underserved customers to help reduce their energy burdens.[11] In support of these objectives, the Oregon PUC recently hired a program director for Diversity, Equity and Inclusion—a new position focused on coordinating and conducting stakeholder outreach to better engage and serve low-income and vulnerable populations.
- California has created specific advisory groups, policies, programs, and metrics to further its objective of promoting energy equity and environmental justice in its energy plans.[12] It "adopted several statutes directing the California Public Utilities Commission (CPUC) to incorporate environmental and social justice objectives into various types of decisions, including prioritizing disadvantaged communities in integrated resource planning (SB 350, 2015) and implementing new approaches to reach communities affected by commission decisions (SB 512, 2016)."[13] The CPUC has extensive programs aimed at expanding access for low-income and environmental justice communities to energy and electrification programs.[14] For example, the *Building Initiative for Low-Emissions*

Development (BUILD) program, one of the CPUC's two building decarbonization pilot programs,[15] dedicates $80 million to new, all-electric, low-income residential buildings.[16] The CPUC also created an Equity Metrics Working Group, which has been tasked with developing equity metrics for energy efficiency programs for customers of regulated utilities.[17]

- In 2021, Colorado Senate Bill SB 21-272 mandated the Colorado PUC to adopt rules for all its work to consider how best to provide equity, minimize impacts, and prioritize decarbonization benefits for historically marginalized environmental justice communities.[18]
- In the same year, the New York Public Service Commission expanded its *Low-Income Energy Affordability Program* to deliver economic relief to over one million low-income households so that residents spend no more than 6 percent of their household income on energy.[19] Moreover, New York's *Climate Leadership and Community Protection Act* (S6599, 2019) has multiple energy justice provisions, including a "requirement to direct at least [35–40 percent] of the program's benefits to historically disadvantaged communities."[20]

Having input from the communities most affected by these policy decisions would prove especially useful in proceedings. Broad and robust stakeholder outreach and engagement through a communication plan is a critical step in considering the impact of climate change policies on a given community and achieving more equitable outcomes. The communication plan should address language barriers and disabilities for example, through translation for written materials and interpretation services at in-person and virtual events.

Reducing barriers to the equal participation of intervenors in regulatory proceedings can increase opportunities to address climate change. To intervene, an organization must have significant funds, time, and expertise available; this may not be realistic for smaller organizations working in frontline communities. Intervenors are often state consumer advocates, large businesses, trade groups, or large nonprofits like Conservation Law Foundation, Acadia Center, the Sierra Club, or the Union of Concerned Scientists. These organizations may consult with environmental justice organizations, communities, and vulnerable customers, but they often do not have the same opinions and lived experiences.

Providing financial or technical assistance to environmental justice organizations, public interest groups, and community members could help reduce barriers to their participation in proceedings and allow them to engage more meaningfully. Alternatively, the PUC could institute rules which automatically grant intervenor status for specific public interest groups and community organizations.

Several states have begun providing financial assistance to environmental justice organizations to help reduce barriers to their participation in regulatory proceedings. For example:

- The Oregon *Energy Affordability Act* expands the state's existing intervenor funding program. This program ensures the organizations that represent the people most impacted by energy burden such as low-income customers, environmental justice communities, and their advocates will be able to access funding to participate in regulatory proceedings. It authorizes public utilities to provide financial assistance (up to $500,000 annually) to organizations that represent the interests of low-income residential customers

who are members of environmental justice communities. The funding is earmarked for Black, Indigenous, and People of Color (BIPOC) communities and community-based organizations.

- California has an intervenor compensation program in which the relevant utilities involved in a proceeding must pay the cost of intervenor participation. However, the process for an intervenor being awarded financial assistance is bureaucratic, and the utility can ultimately pass the costs to its ratepayers.

Lastly, as the transition to clean energy accelerates, it will be critical for states to evaluate how equity is treated in every program and policy it adopts, to ensure that people with higher energy burden are not negatively impacted.

Strengthening Interdepartmental and Interagency Coordination

Effective interdepartmental and interagency coordination and cross-sectoral (e.g., electric, gas, transportation, building) planning are needed to achieve state greenhouse gas emission reduction mandates for 2030 and beyond. Several states have legislated the creation of a climate change coordinating council to help ensure that programs and initiatives are well-coordinated among the PUC and the state's local agencies. For example, in Executive Order 89 of 2019, the New Jersey Governor established the Interagency Council on Climate Resilience, comprised of the Board of Public Utilities and 16 other state entities, which published a Climate Change Resilience Strategy together in October 2021.[21]

Addressing Barriers

In addition to state and local lobbying, national lobbying is having an impact on policies and practices regionwide. For example, the New England Ratepayers Association, a group with undisclosed donors and links to the oil and gas industry,[22] filed a petition with the Federal Energy Regulatory Commission to roll back net metering and other solar incentives across New England. Lobbying by utilities with multi-state service territories is also impacting several states. States could consider implementing policies that limit the amount of influence that utilities have over PUCs and legislators. States could require utilities to report how much money they spend on lobbying the PUC and require PUCs to disclose contact with utility officials and any monetary or in-kind support received.

According to the Acadia Center's RESPECT report, one of the main conflicts of interest with investor-owned utilities is that they have both planning and owner roles.[23] This means utilities have a financial interest in the outcome of system planning. This results in proposals that are reasonable for their investors, but which may be at odds with some stated public policy objectives. The Acadia Center outlines multiple benefits of creating a statewide planning entity that works in conjunction with or as an extension of the PUC. These benefits include the opportunity for more stakeholder engagement earlier in the process, greater planning oversight, the ability to set criteria in alignment with public policy goals, reduced conflicts of interest (e.g., utility planning), and reduced difficulty in planning decisions and prioritizing dockets.

Innovative regulatory processes can also help level the playing field between intervenors. For example, in Hawaii, facilitators from Rocky Mountain Institute led a series of workshops on Hawaii's performance-based regulation proceeding. The PUC decided the agenda while the utility's role was merely as a participant. Rocky Mountain Institute designed the workshops to ensure all participants could efficiently participant in the complex discussions in an informed and thoughtful way. The design allowed the participants to attempt to reach consensus in a way not often possible in more traditional regulatory settings.[24]

The remainder of this report provides our review of New England state policies and practices. We start by reviewing each state individually. Then, we summarize our key findings across states. Lastly, we pose several questions for consideration and further discussion by stakeholders in workshops scheduled in all New England states in 2022.

New England State Climate Actions and Barriers: Connecticut

Connecticut decision-makers have acted on climate change by passing new climate legislation and developing substantial climate programs. In recent years, Connecticut legislators increased the state's Renewable Portfolio Standard and increased mandatory reduction targets for greenhouse gas emissions. Lawmakers also strengthened Connecticut's environmental justice law by requiring greater communication with environmental justice communities. Connecticut's Public Utilities Regulatory Authority (PURA) initiated and made progress on several aspects of the *Equitable Modern Grid Initiative*, an initiative that incorporates environmental, equity, and resilience goals into other PUC goals such as cost-efficiency, rate stability, and reliability.[25]

Despite this progress, Connecticut faces challenges as it continues to address climate change. The state, like most others, must navigate the impact of lobbying.[26] Efforts to build a regional *Transportation and Climate Initiative* of 14 states to address transportation-related climate issues fell through because of successful lobbying to oppose it.[27] This exacerbates another challenge Connecticut faces: it is not on track to meet its targets to reduce greenhouse gas emissions.[28]

Connecticut Climate Goals

Greenhouse Gas Emissions Reduction Goals	Baseline	2001
	By 2030	45% (act. 14% in 2018)
	By 2050	80%
Renewable Portfolio Standards		40% (by 2030)
Energy Efficiency Savings Targets (% of Total Sales)		1.1% (2019-2021)
Energy Storage Requirements		1,000 MW (by 2030)

See Table 2 for full details.

Climate Legislation and Policies

Connecticut's legislature passed the landmark *Global Warming Solutions Act* in 2008, establishing a legally binding, economy-wide greenhouse gas emission reduction target of 10 percent below 2001 levels by 2020 and 80 percent by 2050 (Public Act 08-98).[29] In recent years, it has passed several additional large pieces of climate legislation. In 2018, *An Act Concerning Connecticut's Energy Future* (Public Act 18-50) extended the state's Renewable Portfolio Standard from 20 percent of electricity being provided by renewable sources by 2020 to 40 percent by 2030. In the same year, *An Act Concerning Climate Change Planning and Resiliency* (Public Act 18-82) added another milestone to the greenhouse gas emissions reduction target of 45 percent below 2001 levels by 2030.[30] Within the same Public Act 18-82, the legislature explicitly integrated greenhouse gas emission reductions into Connecticut's Comprehensive Energy Strategy and integrated resource plan.[31]

Connecticut Governor Ned Lamont recently enacted Public Act No. 21-53, establishing a goal to deploy one gigawatt (GW) of energy storage resources by 2030 to support carbon reduction goals. Public Act No. 21-53 also set interim storage

deployment targets of 300 MW by the end of 2024 and 650 MW by the end of 2027. Additionally, the Act directs the state's PUC —the Public Utilities Regulatory Authority (PURA)—to pursue the development of rate designs and programs that support and incentivize the deployment of energy storage resources. Finally, the Act gives Connecticut's Department of Energy and Environmental Protection (DEEP) the authority to procure energy storage projects that are shown to be cost-effective.[32]

Connecticut has a Governor's Council on Climate Change, which includes 23 members from state agencies, quasi-public agencies, businesses, local governments, and nonprofits. This council is working to address mitigation strategies to reduce greenhouse gas emissions and to consider adaptation and resilience in the face of climate change impacts. Also, Connecticut's PUC, Energy Office, and Environment Office are all under the Department of Energy and Environmental Protection (DEEP).

Environmental Justice Legislation and Policies

In a policy issued in 1993 by DEEP, Connecticut adopted one of the first policies regarding equity which set forth a definition and goals.[33] The state's first environmental justice law was enacted in 2008. The intention behind the law is to increase public participation in decisions regarding the siting and expansion of facilities such as power plants, waste treatment facilities, and more.[34] The law requires applicants seeking to site a facility in an environmental justice community to submit a "meaningful public participation plan" and to consult with local officials to determine whether there is a need for a community environmental benefit agreement. However, environmental justice advocates—such as the Connecticut League of Conservation Voters—note that the law lacks significant penalties for polluters who ignore it.[35]

In 2020, Connecticut lawmakers strengthened the environmental justice law by requiring facility owners to improve their communication with the public as well as to provide funds to mitigate environmental impacts on communities surrounding facilities. Specifically, facility owners must actively engage with the members of environmental justice communities through public hearings.[36] There is no requirement for the hearings to include language translation services, although there is a requirement that the time and location of the meeting be convenient for residents.

The PUC and its Climate-Related Regulatory Actions

PURA is housed within DEEP as a part of the energy branch.[37] PURA is responsible for regulating the rates and services of the state's investor-owned electricity, natural gas, water, and telecommunication companies. PURA is also responsible for balancing the public's right to safe, adequate, and reliable utility service at reasonable rates with the provider's right to a reasonable return on its investment.[38] PURA's decisions are statutorily guided by Connecticut's energy strategies and plans, including its Clean Energy Standard, Integrated Resource Plan, and Conservation and Load Management Plan. Both the Clean Energy Standard and Integrated Resource Plan are required, per Public Act 18-82, to focus on the ways in which Connecticut will achieve its binding climate targets within the *Global Warming Solutions Act* (Act 08-98).

PURA recently took several significant regulatory actions to address climate change, with the largest

being the *Equitable Modern Grid Initiative* (Docket No. 17-12-03). Within this proceeding, PURA states it is pursuing regulatory action that enables economy-wide decarbonization, advances energy affordability,[39] and supports the growth of a green economy. The proceeding contains 11 areas of focus called "tracks," each with its own docket. The 11 tracks include *Energy Affordability*, *Zero Emission Vehicles*, and *Distributed Energy Resource Analysis* and *Program Reviews*, among others.

Within the *Equitable Modern Grid Initiative*, PURA issued a final decision implementing a statewide electric storage program that offers incentives and programs in support of the state's goal of deploying 1 GW of energy storage resources by 2030.[40] However, the state's interconnection rules exclude storage, which hinders streamlined connection to the electricity grid.[41] PURA also issued a final decision for a statewide electric vehicle charging program that set electric vehicle charging deployment targets and developed an incentive structure to encourage electric vehicle charging deployment.[42]

Barriers to Climate Action

Despite its progress and successes, Connecticut faces several barriers to climate action. One such barrier is the presence of lobbying. Connecticut faces lobbying against climate programs like the *Transportation and Climate Initiative* from the Yankee Institute for Public Policy and the Koch family, among others.[43] Utilities are also major lobbying entities. In 2020, Eversource spent the second largest amount on lobbying within the state.[44,45] While utilities can favor or oppose different types of climate action, it is important for PURA and state lawmakers to ensure that utility lobbying efforts do not give undue weight to utility interests at the expense of customers' interests or environmental goals. Stakeholders representing customer, environmental justice communities, and environmental interests do not have the ability to meaningfully compete with coordinated and well-funded lobbying efforts, which can result in disproportionately greater utility influence at PURA and at the legislature.

Connecticut will also need to continue to innovate to meet its climate goals. Earlier this year, DEEP reported that the state is not on track to meet its targets to reduce greenhouse gas emissions.[46] DEEP notes, "significantly reducing transportation emissions—and meeting the state's overall emission goals—will require not only strategies to further improve fuel economy, especially by boosting adoption of zero-emission vehicles, but also strategies to reduce vehicle miles traveled." While the *Equitable Modern Grid Initiative* is a means through which PURA and other state agencies can develop programs to better align with state targets, it will likely need additional support to reduce transportation-sector emissions. Addressing climate change will need to be elevated to a priority on par with PURA's other imperatives such as affordability and reliability.

New England State Climate Actions and Barriers: Maine

In recent years, Maine increased its Renewable Portfolio Standard to 80 percent renewable supply of electricity by 2030 and established a Maine Climate Council to chart a course to meet the state's carbon emission reduction goals. In addition to its existing responsibilities to ensure system reliability and resource adequacy, the Maine PUC is now explicitly required to consider the state's greenhouse gas emission reduction goals and energy burdens and environmental impacts on environmental justice communities. At the same time, Maine faces obstacles in meeting its climate goals including the presence of lobbying and legislative challenges.

Climate Legislation and Policies

Maine decision-makers introduced several pieces of substantial climate legislation in recent years. In June 2019, Governor Janet Mills signed legislation that increased Maine's Renewable Portfolio Standard to 80 percent by 2030, as well as introducing a goal of 100 percent by 2050.[47] The same legislation requires Maine's PUC to support these goals by obligating investor-owned transmission and distribution utilities to procure long-term contracts for new clean energy generation by specific deadlines.[48] In 2019, *An Act to Promote Clean Energy Jobs and To Establish the Maine Climate Council* created an entity charged with leading Maine's efforts to meet its greenhouse gas emission reduction goals of 45 percent below 1990 levels by 2030 and 80 percent below 1990 levels by 2050.[49] The Maine Climate Council, an assembly of scientists, industry leaders, local and state officials, and engaged citizens, is tasked with charting a path for meeting these goals while also promoting jobs and economic benefits during the ongoing transition to a lower carbon economy.[50] The Council tracks and regularly publishes reports on its progress and documents public feedback on its website.[51]

Maine Climate Goals

Greenhouse Gas Emissions Reduction Goals	Baseline	1990
	By 2030	45% (act. 18% in 2017)
	By 2050	80%
Renewable Portfolio Standards		80% (by 2030) 100% (by 2050)
Energy Efficiency Savings Targets (% of Total Sales)		2.3% (2020-2022)
Energy Storage Requirements		300 MW (by 2025) 400 MW (by 2030)

See Table 2 for full details.

More recently, Governor Mills signed into law a bill establishing a goal of deploying 300 MW of energy storage capacity by 2025 and 400 MW by 2030.[52] The bill also directs the PUC to explore rate designs such as time-of-use rates that might help to support these energy storage goals by incentivizing the development of storage projects.

Environmental Justice Legislation and Policies

An Act to Require Consideration of Climate and Equity Impacts by the Public Utilities Commission, enacted in 2021, adds environmental justice considerations to the existing responsibilities of the Maine PUC.[53] The Maine PUC can order a

utility to provide financial compensation for stakeholder participation in PUC proceedings.[54] Also, the Maine Climate Council has an equity subcommittee.[55]

The PUC and its Climate-Related Regulatory Actions

Maine's PUC is responsible for ensuring that Maine citizens have access to safe and reliable utility services at rates that are just and reasonable for customers and public utilities, while also helping achieve reductions in state greenhouse gas emissions.[56,57] Legislation from 2019 required the procurement of long-term contracts for new clean energy generation.[58,59] Most importantly, legislation in 2021 required the PUC to be held accountable for climate action.[60] Ultimately, this purpose was codified in the PUC's mission statement.[61]

In addition to its clean energy procurement efforts, the PUC has several ongoing proceedings. In its investigation into the design and operation of Maine's electric distribution system,[62] the PUC will consider how to accommodate increasing amounts of renewable energy alongside load growth from the heating and transportation sectors. Currently, the states' interconnection rules exclude storage—a resource viewed as critical to achieving high penetrations of renewables.[63]

Barriers to Climate Action

While Maine decision-makers have made progress on climate action through legislative and regulatory initiatives, the state faces challenges to its efforts. As with most states, Maine experiences lobbying and legislative challenges. For example, there is an ongoing debate over whether to pursue the New England Clean Energy Connect (NECEC) project, a transmission project that would bring hydropower from Quebec to New England. The project faces considerable lobbying both for and against it, including from utilities such as Central Maine Power, conservation groups, and natural gas industry-funded groups.[64]

New England State Climate Actions and Barriers: Massachusetts

Massachusetts is acting on climate change through the passage of new legislation that mandates the Department of Public Utilities (DPU) consider climate change as part of its official mission.[65] It also requires the DPU to develop official state language on environmental justice and classify environmental burdens. Despite legislative progress, fossil fuel and utility lobbying pose challenges to the advancement of climate and environmental justice action throughout the state. In addition to lobbying, conflicts of interest and utility control over the identification and selection of solutions and solutions providers are barriers to creating a climate resilient Massachusetts.

Climate Legislation and Policies

The Global Warming Solutions Act and *The Green Communities Act,* both signed in 2008, were the first legislation to require climate action by a state PUC. They established three divisions–energy efficiency, renewable energy development, and green communities–within the Department of Energy Resources (DOER) that are mandated to coordinate with the DPU.[66] Pursuant to the *Global Warming Solutions Act of 2008,* which provided concrete steps to achieve emissions reductions, the secretary of the Executive Office of Energy and Environmental Affairs (EEA) set greenhouse gas emissions limits for 2030 and 2050 at 45 percent and 85 percent of 1990 levels, respectively.[67,68] In 2021, *An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy* (2021 Roadmap Bill) changed the 2030 limit to 50 percent and the 2050 limit to 100 percent or net zero.[69]

Massachusetts Climate Goals

Greenhouse Gas Emissions Reduction Goals	Baseline	1990
	By 2030	50% (act. 22% in 2018)
	By 2050	100%
Renewable Portfolio Standards		40% (by 2030)
Energy Efficiency Savings Targets (% of Total Sales)		2.7% (2019-2021)
Energy Storage Requirements		1,000 MWh (by 2025)

See Table 2 for full details.

The 2021 Roadmap Bill also explicitly mandates the DPU to consider climate impacts as part of its official mission.[70] It establishes a new precedent specific to regulation of gas utilities that directs the DPU to expand its existing priorities of system safety, security, reliability, and affordability to include equity and reductions in greenhouse gas emissions. In addition to expanding the DPU's mission to include equity and emissions reductions goals, the bill raises the required percentage of Massachusetts electricity that comes from renewable sources. It requires the Renewable Portfolio Standard to increase three percent annually from 2025 to 2029 to reach 40 percent by 2030.[71]

Environmental Justice Legislation and Policies

Environmental justice considerations were introduced in Massachusetts legislation in 2002 with the *Environmental Justice Policy of the Executive Office of Environmental Affairs.* This policy was informed by the Massachusetts Environmental Justice Advisory Committee (MEJAC) composed of local community groups, industry, the faith community, academia, and the indigenous community.[72] The policy reinforced the importance of community involvement in environmental decision-making and defined multiple key environmental justice terms to inform the work of the EEA and its subsidiary divisions. In 2002, the DPU was not yet integrated with the EEA. The integration of the DPU under the EEA's purview enabled application of the policy to the DPU's directives.

The *Executive Order on Environmental Justice* (No. 552), issued by former governor Deval Patrick, directed the Secretary of EEA to "determine whether activities undertaken to comply with state regulations and efforts disproportionately impact low-income communities."[73] It created a Director of Environmental Justice position, and established a Governor's Environmental Justice Advisory Council and an Interagency Working Group. With passage of the 2021 Roadmap Bill, Massachusetts defined an "environmental justice population" and expanded the definition of "environmental burden" to include climate change for key permit reviews.[74]

The PUC and its Climate-Related Regulatory Actions

Massachusetts was the first state in New England to combine energy and environmental agencies under one cabinet secretary: the Department of Public Utilities (DPU), Department of Energy Resources (DOER), Department of Environmental Protection (MassDEP), and the Energy Facilities Siting Board (EFSB) are overseen by the Executive Office of Energy and Environmental Affairs.[75] This integration was an important step in improving coordination between environmental, energy, and economic regulators.[76]

The Massachusetts' DPU is responsible for ensuring that customers of regulated utilities are protected and that utility companies are providing reliable, low-cost service.[77,78] The DPU's mandate also includes promoting greenhouse gas emission reductions, overseeing transportation and natural gas pipeline safety, and supervising the energy facilities siting process.[79] The DPU has recently undertaken grid modernization directives in line with the 2021 Roadmap Bill. The DPU required each electric distribution company to submit an updated grid modernization plan, as well as a plan to achieve full-scale deployment of advanced metering infrastructure (Docket 21-80, Docket 21-81, and Docket 21-82). Eversource, National Grid, and Unitil submitted separate plans that included a 10-year grid modernization vision, a five-year strategic plan, and a four-year investment plan (covering 2022–2025).[80] Electric vehicle charging infrastructure proposals have also been a key focus with Eversource, National Grid, and Unitil requesting approval for programs (Docket 21-90, Docket 21-91, and Docket 21-92, respectively).[81]

Most recently, the DPU opened an investigation into the future of the natural gas industry in Massachusetts.[82] The DPU acknowledged the transition would require new policies to protect ratepayers and significant changes to local distribution company planning processes and business models.[83]

Barriers to Climate Action

Despite adoption of ambitious climate and environmental justice legislation in Massachusetts, there are still impediments to meaningful action. Coalitions of utilities, fossil and chemical companies, real estate companies, and fossil fuel power generation companies frequently oppose climate and clean energy bills through legislative lobbying and active involvement in DPU regulatory proceedings.[84] Findings from a recent research report indicate that clean energy advocates are outspent by utilities on lobbying by a factor of more than 3.5 to 1. As a result, utility companies are often better positioned for success throughout the legislative process.[85]

Conflicts of interest may be contributing to barriers to climate action in the state. For example, in 2019 the DPU ordered an audit of National Grid (DPU 18-150). The winning bid for $1 million went to FTI Consulting with two former National Grid employees acting as key players in the audit.[86] The process for investigating the future of gas may also present some cause for concern. Local distribution companies are responsible for developing a scope of work to respond to the decarbonization goals, issuing the related request for proposals, and selecting independent consultants.[87] By allowing utilities to select and manage the consultants, DPU may be giving the utilities too much autonomy, limiting transparency and participation, and stymieing significant industry change.

New England State Climate Actions and Barriers: New Hampshire

The volatile political climate in New Hampshire makes it challenging for the New Hampshire Public Utilities Commission (NHPUC) to take a more consistent and long-term view on clean energy and environmental policy. Over the past 13 years, the state has spent eight years under a Democratic governor and five years under a Republican governor and has twice oscillated between Republican and Democrat majorities in the legislature. This political volatility is exacerbated by the fact that New Hampshire is one of just two states with two-year rather than four-year gubernatorial terms. The process of passing environmental legislation often outlasts the tenure of policymakers constructing the policies, so the NHPUC seems reluctant to take a strong stance on environmental issues as the eventual reversal of those policies could cause regulatory uncertainty and confusion. The state's lack of clear legislative or gubernatorial mandates to expand clean energy provides scant motivation for change for the PUC, which has been reluctant to act on climate change through energy regulation. In fact, the NHPUC has expressed its role as an economic rather than environmental regulator.[91] Faced with a variety of dockets whose outcomes have a substantial impact on the state's carbon emissions, the NHPUC's discourse and decisions have remained quite rigidly focused on economic issues.[88]

Climate Legislation and Policies

In January 2021, the state legislature introduced House Bill 172, which would establish a climate action plan, set greenhouse gas emission reduction goals for the state, and authorize the Department of Environmental Sciences to report on greenhouse gas emissions on an annual basis.[89]

New Hampshire Climate Goals

Greenhouse Gas Emissions Reduction Goals	Baseline	None
	By 2030	
	By 2050	
Renewable Portfolio Standards		25% (by 2025)
Energy Efficiency Savings Targets (% of Total Sales)		0.6% (2022 est.)
Energy Storage Requirements		None

See Table 2 for full details.

The House Science, Technology, and Energy Committee recommended rejecting the bill in an 11-10 vote.[90] As a result, New Hampshire is the only New England state without any greenhouse gas emissions reduction goal. In August 2021, legislators passed Senate Bill 86 prohibiting any type of restriction on new natural gas hookups.[91]

Environmental Justice Legislation and Policies

New Hampshire does not have an official definition of environmental justice or any related policies or laws. However, the state does offer financial compensation for stakeholder participation in PUC proceedings.[92]

The PUC and its Climate-Related Regulatory Actions

According to its mission statement, the main purpose of the NHPUC is to ensure safe, reliable service at reasonable rates by balancing the interests of the utilities and their customers.[93] The NHPUC has a constitutional mandate that includes maximizing energy efficiency, protecting public health and the physical environment, considering utility financial stability, and prioritizing reliable and diverse energy sources.[94] In 2008, the NHPUC staff created a sustainable energy division, which has become increasingly effective at addressing renewable energy issues.[95] However, as climate change and clean energy have gained momentum as a regulatory issue in New Hampshire, the NHPUC has resisted adopting and directly impeded progress on environmental policies. For example, the state has lagged in adopting a Renewable Portfolio Standard (RPS) and an Energy Efficiency Resource Standard (EERS).

In the past five years, the NHPUC has had the opportunity to regulate a range of issues directly related to climate change, including net-metering,[96] grid modernization, and energy efficiency. With regards to net-metering, electric utilities argued that the net-metering tariffs unfairly shifted costs to non-participating customers and recommended reducing compensation for net-metering in response to the May 2016 House Bill 1116.[97,98] The NHPUC decided that, given low distributed generation penetration levels, there was little evidence of cost-shifting to customers without solar photovoltaic systems and left the original tariff in place.[99]

Regarding grid modernization, the NHPUC recommended that utilities integrate grid modernization considerations into least-cost integrated resource planning (LCIRP) and established a Grid Modernization Stakeholder Group (GMSG) to facilitate the utilities' distribution system planning process through LCIRP's.[100] However, the NHPUC suspended the GMSG when Eversource, one of four electric utilities in the state, filed a motion arguing that the GMSG process should be excluded from most resource planning for technical and legal reasons. This suspension undermined and stalled the prospects for grid modernization progress in New Hampshire.[101]

Regarding energy efficiency programs, New Hampshire historically has received the lowest score of the New England states on energy efficiency efforts. In recent years, the state has steadily improved its position due to the NHPUC-approved development of energy efficiency programs.[102] In 2016, the NHPUC approved the concept of an Energy Efficiency Resource Standard (EERS) in Docket No. DE 15-137. However, on November 12, 2021, in a radical departure from the state's prior stance on energy efficiency, the NHPUC issued an order that would cut budgets for utility energy efficiency programs nearly in half by 2023 compared to 2020 levels.[103] This action disregarded a settlement agreement among all the formal parties to the proceeding, including the state's electric utilities, the New Hampshire Consumer Advocate, and several non-profit organizations. In the absence of clear direction and an assignment of climate responsibility from the legislature, the NHPUC seems unwilling to expand its role beyond that of an economic regulator or to lead on ambitious climate and energy policy.

Barriers to Climate Action

The issues under the NHPUC's purview are increasingly interconnected with climate. However, the NHPUC has neither the mandate to

act on climate nor any real authority to implement climate mandates.[104] As a result, the NHPUC has proven inconsistent in its framing of environmental responsibilities, hesitant in its regulation of environmental matters, and disinclined to advance and adopt policies without explicit direction from the legislature.

While the lack of legislative guidance may be a key barrier for more ambitious climate governance at the NHPUC, New Hampshire's political volatility also plays a considerable role in the state's relative reluctance to act on climate and energy policy. Additionally, New Hampshire’s strong libertarian priorities, which often include opposition to regulation and taxes, can lead to reluctance towards adopting clean energy and environmental policies.[105]

New England State Climate Actions and Barriers: Rhode Island

Rhode Island passed its first legally binding legislation mandating the reduction of greenhouse gas emissions in April 2021. All departments, agencies, commissions, councils, and initiatives or other instruments of the state are now obligated to address the impacts of climate change. Created by Executive Order of Governor Lincoln Chafee in 2013, the state's Executive Climate Change Coordinating Council (the EC4) is tasked with implementing a climate plan with an equitable transition that centers on environmental justice and public health.[106] Originally written in 2016 under precursor legislation, this climate plan will be updated by 2022 and every five years moving forward.

Climate Legislation and Policies

In April 2021, Rhode Island adopted the *Act on Climate* (2021-H 5445) which set legally binding limits for greenhouse gas emissions of 45 percent below 1990 levels by 2030, 80 percent by 2040, and net-zero by 2050.[107] This act builds off the *Resilient Rhode Island Act* (2014-H 7904), which provided a framework for the state government to adaptively plan for and manage climate change impacts, led by the EC4.[108] Rhode Island's Executive Climate Change Coordinating Council is composed of 12 state agencies and assists in incorporating climate change impacts into the duties of all state agencies to meet the state's greenhouse gas emission reduction targets.[109] The EC4 structure includes an Advisory Board and a Science and Technology Advisory Board, both of which include members outside state government. The *2021 Act on Climate* directs the Rhode Island Public Utility Commission (RIPUC) to oversee and enforce the Renewable Energy Standard and Long-Term Contracting Standard for Renewable Energy, and it asserts that the RIPUC is "statutorily responsible" for the execution of both. It also requires the administrator of the Division of Public Utilities and Carriers (DPUC or Division) to serve on the Climate Change Coordinating Council.[110]

Rhode Island Climate Goals

Greenhouse Gas Emissions Reduction Goals	Baseline	1990
	By 2030	45% (act. 12% in 2016)
	By 2050	100%
Renewable Portfolio Standards		39% (by 2035)
Energy Efficiency Savings Targets (% of Total Sales)		2.5% (2018-2021)
Energy Storage Requirements		None

See Table 2 for full details.

The RIPUC has two rules—*Long-Term Contracting Standards for Renewable Energy* (810-RICR-40-05-1) and *Implementation of a Renewable Energy Standard* (810-RICR-40-05-2)—that have directed renewable energy retailers since 2007 to supply eligible renewable energy resources, with targets to increase the percentage with continual review.[111] In 2020, former Governor Gina Raimondo issued *Advancing a 100% Renewable Energy Future for Rhode Island by 2030* (Executive Order 20-01) that instructed the RIPUC and the DPUC to support the Office of Energy Resources (OER) in developing policies and programs to

reach 100 percent renewable energy by 2030.[112] While the order explicitly directed DPUC, RIPUC, and the Department of Environmental Management (DEM) to support OER in the effort, bills proposing a 100 percent renewable energy standard (RES) have not yet passed, and there was no language making the 2030 renewable energy target binding.[113]

Environmental Justice Legislation and Policies

Rhode Island has very little in statute related to environmental justice[114] and no singular, dedicated, public-facing office, council, or position for environmental justice (the Governor's FY2023 proposed budget does include an environmental justice position in the RI Department of Environmental Management). According to R.I. Gen. Laws §42-140-3, one of the Office of Energy Resources' statutory purposes is to promote the provision of energy resources "in a manner that enhances economic well-being, social equity, and environmental quality."[115] OER's mission is to lead the state toward an equitable energy future and OER has a Program Manager for Energy Justice.[116]

The Department of Environmental Management has the *Policy for Considering Environmental Justice in the Review of Investigation and Remediation of Contaminated Properties*,[117] which acknowledges disparities in the location of contaminated sites under the authority of the Department of Environmental Management, but does not provide guidance on how to address these issues. The EC4 climate plan must include an "equitable transition to climate compliance for environmental justice populations, redress past environmental and public health inequities"[118] and meaningfully involve the interests of and people from "populations most vulnerable to the effects of climate change and at risk of pollution, displacement, energy burden, and cost."[119]

The PUC and its Climate-Related Regulatory Actions

The RIPUC's mandate is to regulate rates, tariffs, tolls, and charges, and the sufficiency and reasonableness of facilities and accommodations of utilities in the state.[120] In other words, it must ensure the affordability and reliability of energy. The Division of Public Utilities and Carriers is a distinct regulatory body housed within RIPUC[121] supporting the Commission's directives.[122] The Office of Energy Resources, the Department of Environmental Management, and the DPUC are all member agencies of the coordinating council EC4, and collaboration between the departments is encouraged in developing a regulatory framework for a cleaner, more affordable, and reliable energy future.[123] There are a number of clean energy policies and programs in place, including a renewable energy standard and procurement plan, energy efficiency efforts, long-term renewable energy contracting, a Renewable Energy Growth program, and a net metering program. The state received the fourth highest score on its energy efficiency programs in 2020, just below California, Massachusetts, and Vermont in national rankings.[124] The RIPUC has taken up multiple dockets concerning the implementation of "community-choice aggregation"[125] programs in targeted communities. In March 2021, four cities received approval from RIPUC to expand access to renewable energy electricity at competitive rates through community-choice aggregation.[126] However, Rhode Island has reduced its funding for heating electrification through its energy efficiency programs in recent years.[127] Also, as with other states, Rhode Island is missing an opportunity to

facilitate installation of storage because its interconnection rules exclude this resource.[128]

Barriers to Climate Action

Despite having a climate coordinating council (EC4), questions remain about its effectiveness in taking meaningful steps toward climate action in Rhode Island. The latest assessment by Civic Alliance for a Cooler Rhode Island (CACRI) concluded for the third time that the EC4 was making insufficient progress.[129] One problem with the EC4 is that it lacks the authority, staff, and funding to effectively achieve the state's climate reduction targets. Although the EC4 has access to powerful tools and comprehensive datasets and numerous climate adaptation and mitigation studies and reports have outlined what needs to be done, the state agencies' efforts to aggressively pursue decarbonization and adaptation measures have been hampered by limited financial investments and technical capacity. There is also a lack of accountability regarding which state agencies should act on the recommendations, since some studies, like the Resilient Rhody strategy, fail to prioritize climate actions and to assign agency responsibilities.[130] Finally, despite talk about the importance of equity and public participation in Rhode Island's climate efforts, the EC4 continues to meet during times that are inaccessible to the working public.

New England State Climate Actions and Barriers: VERMONT

Vermont has a reputation for leadership and innovation regarding its legislation of climate policies and implementation of renewable energy and energy efficiency programs.[131] Vermont lawmakers have adopted ambitious environmental goals on aggressive timelines. The recent passage of the *Global Warming Solutions Act* (Act 153 of 2020) put Vermont among U.S. states that have adopted statutory greenhouse gas emissions targets.[132] However, Vermont is not on track to achieve its 2030 goals, having reduced greenhouse gas emissions by two percent below 2005 levels and increased emissions by 13 percent since 1990. Vermont is particularly challenged by the fact that the largest consumers of fossil fuels and carbon emitters are the transportation and heating sectors.[133] Wood and wood waste remain a major source of electricity generation and home heating. In collaboration with other state entities, the Vermont Public Utilities Commission (VT PUC) implemented successful state-legislated renewable energy and energy efficiency programs. However, the PUC's *2020 Annual Report* noted that Vermont lacks the public funding necessary to meet its greenhouse gas emission reduction commitments.

Currently, there is no environmental justice policy for Vermont. Senate Bill S.148, introduced in 2021, would (if passed) require state agencies to incorporate environmental justice into their work and create an Advisory Council on Environmental Justice.[134,135]

CLIMATE LEGISLATION AND POLICIES

The state legislature has an overarching goal of supporting renewable energy development according to the state's energy policy.[136] In 2005,

Vermont Climate Goals

Greenhouse Gas Emissions Reduction Goals	Baseline	1990
	By 2030	40% (act. 113% in 2016)
	By 2050	80%
Renewable Portfolio Standards		75% (by 2032)
Energy Efficiency Savings Targets (% of Total Sales)		2.4% (2018-2020)
Energy Storage Requirements		None

See Table 2 for full details.

the Vermont General Assembly established the Vermont Clean Energy Development Fund (CEDF) through Act 74 (30 V.S.A. § 8015) to increase the development and deployment of cost-effective, renewable energy and combined heat and power resources in Vermont.[137] In 2009, pursuant to 30 V.S.A. § 8005a, it created the Standard Offer Program, a feed-in-tariff program to encourage the purchase of renewable power.[138] The Renewable Energy Standard (RES) program, established in 2015 under Act 56, requires retail electricity providers to be 55 percent renewable in 2017, rising 4 percent every three years to 75 percent in 2032.[139] They must also reduce fossil fuel use by their customers by an amount equivalent to 2 percent of retail electric sales in 2017, rising 0.67 percent per year to 12 percent by 2032. Vermont has nearly met its 2025 goal of 67 percent renewable energy for the electric sector,

pursuant to its Comprehensive Energy Plan. Further, its goal of 25 percent renewable energy across the transportation, thermal, and electric energy sectors by 2025 is within reach.

In September 2020, the Vermont Legislature passed the *Global Warming Solutions Act* (Act 153 as Enacted), a climate-action accountability framework that created legally binding emission reduction targets to reduce greenhouse gas pollution to 26 percent below 2005 levels by 2025, 40 percent below 1990 levels by 2030, and 80 percent below 1990 levels by 2050.[140] However, Vermont's current greenhouse gas emissions reductions of 2 percent below 2005 levels[141] are well below the reduction goals in the Clean Energy Plan and emissions have increased 13 percent since 1990.

Vermont is uniquely challenged by its transportation and thermal fuel (e.g., natural gas, propane, fuel oil, biomass, electric heat) sectors, which are responsible for more than 70 percent of Vermont's greenhouse gas pollution.[142] Seventeen percent of Vermont's electricity generation comes from biomass, including wood, which can sometimes cause problems of air pollution and deforestation.[143] Also, the state's interconnection rules exclude storage.

In October 2020, the State appointed 23 members to the Vermont Climate Council[144] which leads development of the state's Climate Action Plan. An initial plan was adopted on December 1, 2021. The Climate Action Plan includes strategies to reduce carbon emissions to achieve 80 percent greenhouse gas emissions reduction (compared to the 1990 baseline) by 2050 across all sectors, to build and encourage climate adaptation and resilience, and to reduce energy burdens for rural and marginalized communities in Vermont.[145]

Environmental Justice Legislation and Policies

In 2016, the Vermont Department of Environmental Conservation (DEC) decided to incorporate environmental justice into all its programs.[146] DEC staff formed a team in 2018 to define exactly how to address environmental justice through collaboration with external stakeholders and other state agencies.[147] The 2020 *Global Warming Solutions Act* included a focus on "reducing energy burdens and minimizing negative impacts on rural and marginalized communities, as well as rebuilding and growing the [s]tate's economy while protecting public health, enhancing community resilience and carbon capture and sequestration."[148]

In 2021, Democratic Senator Kesha Hinsdale introduced Senate Bill S.148 to establish an environmental justice policy for the state that would (1) require state agencies to incorporate environmental justice into their work,[149] (2) create an Advisory Council on Environmental Justice within the Agency of Natural Resources to advise on environmental justice issues and (3) require the creation of an environmental justice mapping tool.[150] The bill is currently under review by the Senate Committee on Natural Resources and Energy.[151]

The PUC and its Climate-Related Regulatory Actions

The VT PUC is tasked with adopting the rules needed to allow it and the Department of Public Service to implement and supervise the Renewable Energy Standard and Clean Energy Development Fund programs. The VT PUC also regulates the construction and operation of net-metering[152] systems (Rule 5.100) and reviews and approves utility net-metering tariffs, which govern

the terms and conditions of net-metering service.[153] Over the past 20 years, under the legal authority of the state legislature, the VT PUC has regulated greenhouse gas emissions, renewable energy programs, net-metering operations, and energy efficiency. Two energy efficiency utilities in Vermont, Burlington Electric Department and Efficiency Vermont, currently deliver the electric efficiency programs and services in the state.[154,155] The Department of Public Service evaluates the efficiency programs delivered by energy efficiency utilities to ensure that claimed savings are achieved.[156]

The Department of Public Service (DPS), the public's advocate, provides long-range planning for the state's energy needs through the Comprehensive Energy Plan in conjunction with other state agencies and the Climate Council. The plan is updated every six years and was last updated in January 2022. The plan sets goals for greenhouse gas emission reduction, energy consumption and sources, renewable end use by sector, and transportation.[157] The DPS obtains stakeholder input to update the Comprehensive Energy Plan. This process allows reflection on what is working, identification of unmet targets, and identification of where more aggressive action is needed.

Barriers to Climate Action

Vermont has made steady progress toward more renewable energy, reduced greenhouse gas emissions, and increased building efficiency. But the state is falling short of its greenhouse gas emissions reduction goals, particularly in the two sectors that consume the most energy and emit the most greenhouse gases—the transportation and thermal energy (heating) sectors.[158,159] In addition to limited funding sources and high-upfront costs, another impediment to reducing emissions from unregulated fossil-fuel sectors includes a lack of trained and certified clean energy workers.[160]

Climate Action Best Practices and Barriers Across New England

New England states are making varying degrees of progress toward addressing climate change. We categorize the best practices as:

- **Clarity and Transparency in Climate Legislation:** Setting and achieving economy-wide, legally binding emission reduction targets and other supportive policies,
- **PUC Authority:** Requiring the PUC to address climate change in its mission and decision-making,
- **Promoting Equity and Environmental Justice:** Enacting environmental justice legislation and policies and defining environmental justice, and
- **Strengthening Interdepartmental and Interagency Coordination:** Establishing an *effective* Climate Change Coordinating Council and collaborating on action.

Table 1 provides an overview of the best practices in New England states to address climate change which we discuss in more detail in the following sections.

Clarity and Transparency in Climate Legislation

Connecticut, Maine, Massachusetts, Rhode Island, and Vermont have economy-wide legislative mandates to address climate change though greenhouse gas emission reduction targets. Massachusetts and Rhode Island plan to achieve net-zero greenhouse gas emissions by 2050. New Hampshire is the only state with no mandate. No state is on track to achieve its 2030 greenhouse gas emission reduction goals.

All New England states have a Renewable Portfolio Standard (RPS) requirement. Rhode Island has an existing Executive Order calling for 100 percent renewable electricity by 2030, but this is based on net consumption—the state may still include gas-fired power plants feeding into the New England power grid. Maine is aiming for 100 percent renewable generation by 2050.

Most New England states have electric and natural gas energy efficiency savings targets as a percent of sales Massachusetts, Maine, Rhode Island, and Vermont have electric energy efficiency targets above 2 percent. Connecticut's electric energy efficiency target is closer to 1 percent. We

Table 1. Summary of Climate Action Best Practices in New England States

Best Practice	CT	ME	MA	NH	RI	VT
Setting and achieving economy-wide, legally binding greenhouse gas emission reduction targets and other supportive policies	◑	◑	◑	○	◑	◑
Requiring PUC to address climate change in its mission and decision-making	○	●	●	○	○	○
Enacting environmental justice legislation and policies and defining environmental justice	○	●	●	○	◑	○
Establishing a Climate Change Coordinating Council and collaborating on action	●	●	○	○	◑	●

Legend: ● = achieving best practice; ◑ = partially achieving best practice; ○ = not achieving best practice

estimate New Hampshire targets at 0.6 percent based on budget cuts relative to 2020 spending.

Connecticut, Maine, and Massachusetts have specific energy storage procurement targets. Connecticut appears to have the highest goal but allows more time (until 2030) to reach it.

Table 2 shows New England state climate goals and achievements, including greenhouse gas emission reductions, Renewable Portfolio Standards, energy efficiency savings targets, and energy storage requirements.

Table 2. New England state climate goals and achievements

Climate Goals		CT	ME	MA	NH	RI	VT
Greenhouse Gas Emissions Reduction Goals[i]	Baseline	2001	1990	1990	None	1990	1990
	By 2030	45% (act. 18% in 2018)[ii]	45% (act. 18% in 2017)[iii]	50% (act. 22% in 2018)[iv]		45% (act. 6% in 2017)[v]	40% (act. 0% in 2017)[vi]
	By 2050	80%	80%	100%		100%	80%
Renewable Portfolio Standards[vii]		40% (by 2030)	80% (by 2030) 100% (by 2050)	40% (by 2030)	25% (by 2025)	39% (by 2035)	75% (by 2032)
Energy Efficiency Savings Targets (% of Total Sales)[viii]		1.1% (2019-2021)	2.3% (2020-2022)	2.7% (2019-2021)	0.6% (2022 est.)	2.5% (2018-2021)	2.4% (2018-2020)
Energy Storage Requirements		1,000 MW (by 2030)[iv]	300 MW (by 2025) 400 MW (by 2030)[x]	1,000 MWh (by 2025)[xi]	None	None	None

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PUC Authority

Only Maine and Massachusetts have clear PUC mandates to consider climate change impacts in their decision-making processes and these mandates are identified in their mission statements. PUCs in Connecticut, Rhode Island, and Vermont are acting on the state climate change legislation; however, they are not legally mandated to do so and it is not reflected in their mission statements. It does not appear that the New Hampshire PUC is addressing climate change, corresponding with the absence of state climate policy.

Promoting Equity and Environmental Justice

Connecticut, Maine, and Massachusetts have established environmental justice legislation, policies, and definitions. Rhode Island lacks an environmental justice definition, and as a result, its Climate Change Coordinating Council appears to have difficulty implementing its plans for an equitable climate transition in support of marginalized communities. The state also has no environmental justice legislation or policies. Vermont and New Hampshire do not have environmental justice definitions or policies yet, though Vermont's policy is under development.

Additionally, a PUC mandate like the one in Connecticut that requires utilities to conduct public hearings in a time and place convenient to the target population and to publicize meetings well in advance, creates the beginning of a pathway for dialog and community input. We found no instances of requiring language translation services at public hearings in any of the New England states; although notably, one of the criteria for being an environmental justice population in Massachusetts is lack of English proficiency. Lastly, missing from all states is a comprehensive evaluation of how equity is treated in every program and policy and an effort to address shortcomings of existing programs and policies.

Missing from all states is a comprehensive evaluation of how equity is treated in every program and policy and an effort to address shortcomings of existing programs and policies.

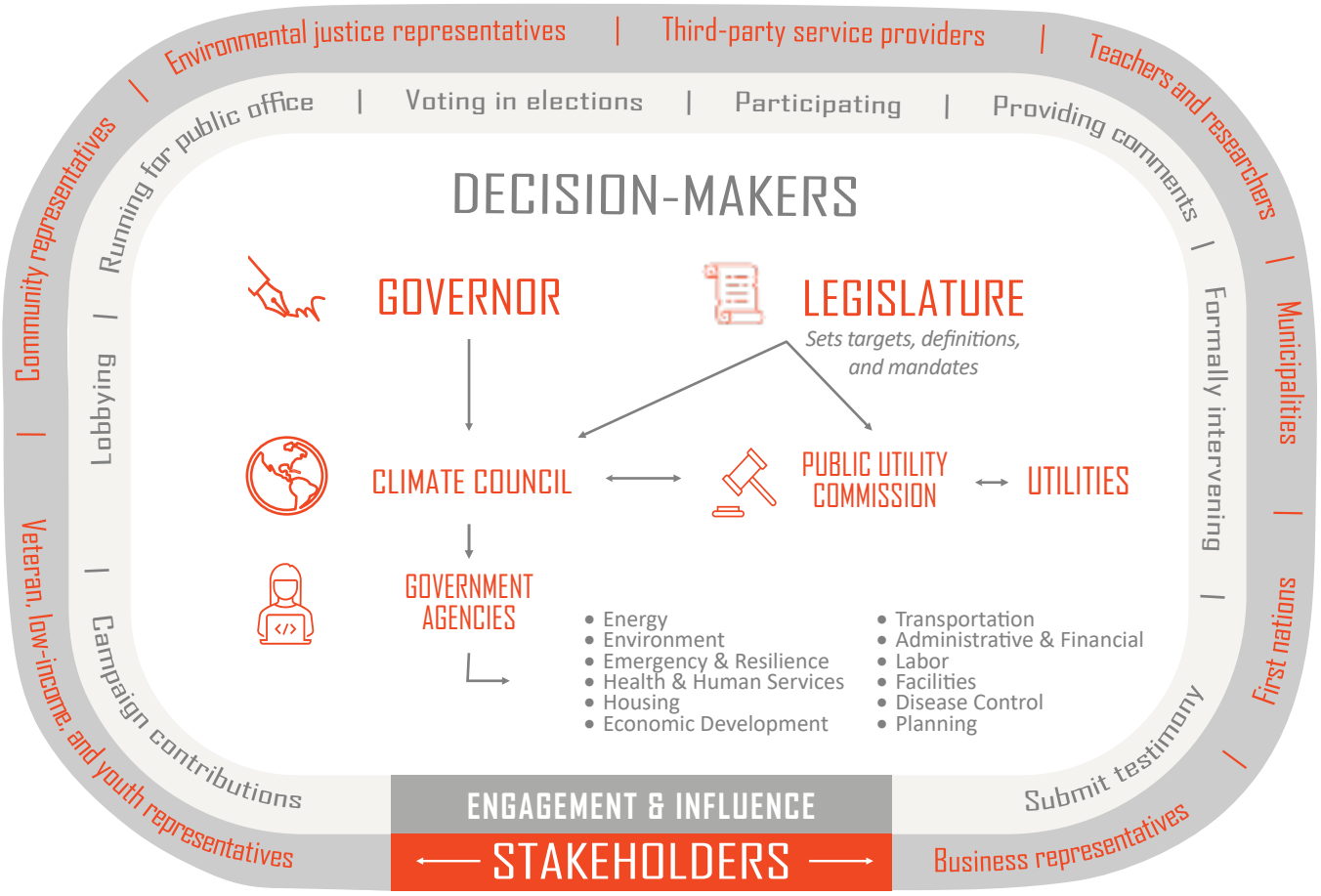
Strengthening Interdepartmental and Interagency Coordination

Connecticut, Maine, Rhode Island, and Vermont have councils in place for coordination of climate change mitigation efforts between their local state agencies and other relevant stakeholders. However, there are questions about the effectiveness of the council in Rhode Island. Massachusetts and New Hampshire do not have councils.

Figure 3 provides an overview of the types of decision-makers and stakeholders involved in climate action in New England states. Within the internal circle labeled Decision-Makers, we find:

- The Governor, which forms the climate council in states with a climate council and runs the local government agencies and the climate council;
- The Legislature, which sets the climate targets and mandates for the climate council and PUC;
- The Climate Council (in states where one exists), which is comprised of government agencies, the PUC, and other types of stakeholders which appear in the outer circle;
- The state's Investor-Owned Utilities, which report to the PUC; and,
- Stakeholders, who can engage with and influence decision-makers by lobbying, providing campaign contributions, running for public office, voting in elections, participating in hearings, workshops, and technical conferences, providing comments, formally intervening, and/or submitting testimony.

Figure 3. Climate Action Decision-Makers and Stakeholders and their Interaction



Despite progress in a few areas, New England states still face significant barriers to timely climate action. These barriers include, but are not limited to:

- lack of a clear legal mandate for the PUC to address greenhouse gas emissions;
- no accountability for PUC non-compliance of legal mandates;
- lack of funding and capacity to support implementation of climate policies;
- leadership changes and instability;
- inequitable participation of environmental justice communities in the regulatory process;
- insufficient coordination with and between state agencies; and
- lobbying, conflicts of interest, and/or utility control issues.

Regarding **greenhouse gas emissions**, Connecticut, New Hampshire, Rhode Island, and Vermont lack a clear legal mandate for the PUC, which may lead to a reluctance to act on climate change. No states with legal mandates have penalties to ensure **PUC accountability for non-compliance with legal mandates. Lack of funding and capacity to support climate policy implementation** was reported in Vermont and Rhode Island; however, other states may be experiencing similar issues.

Leadership changes and instability is a key issue in New Hampshire but appears less so in other states. **Inequitable environmental justice participation** is more broadly relevant with financial assistance or translation services unavailable in many states. Only Maine and New Hampshire offer stakeholder compensation for participation in PUC proceedings. Vermont and New Hampshire have no environmental justice policies or definitions currently, while Rhode Island has made limited progress.

An official climate coordinating council could help reduce **insufficient state agency coordination** by facilitating local government agency interactions on addressing climate change. Massachusetts and New Hampshire currently do not have climate coordinating councils. However, the climate council in Rhode Island is underperforming as it lacks the authority, staff, and funding to effectively achieve the state's climate reduction targets and is not accountable for reaching the climate goals. Organizational structures where PUCs, energy offices, and environmental offices report directly to state DEPs—or to an executive office related to energy and the environment—have been successful at aligning goals and progress.

Excessive influence by utilities, conflicts of interest, and effective lobbying against climate initiatives and programs across several New England states are impeding clean energy and climate progress in many of these states.

Table 3 summarizes the barriers to climate action that New England states face.

Table 3. Barriers to Climate Action in New England

Barrier	CT	ME	MA	NH	RI	VT
Lack of a Clear Legal Mandate for the PUC	Y			Y	Y	Y
No Accountability for PUC Non-Compliance	Y	Y	Y	Y	Y	Y
Lack of Funding and Capacity					Y	Y
Leadership Changes and Inconsistencies				Y		
Inequitable Environmental Justice Participation	Y	Y	Y	Y	Y	Y
Insufficient Coordination with and between State Agencies			Y	Y	Y	
Lobbying, Conflicts of Interest, and/or Utility Control Issues	Y	Y	Y			

Questions for Further Discussion

There is significant variation in the level of progress made in each New England state on climate action, but each one can improve. The purpose of this report is to characterize and summarize the best practices and barriers to highlight where each state is doing well, and where each state might improve. With this information in hand, stakeholders in each state can discuss how to bring about change.

Our stakeholder workshops in each New England state in 2022 will provide the opportunity for some of these conversations and actions. During these workshops, we anticipate discussing the following questions. We encourage stakeholders to consider these questions in advance of the workshops and come ready to actively participate.

1. What does "meaningful and equitable climate action" mean? How should we define it? How should we measure it?
2. What are the characteristics of strong climate policies and programs? What policies and programs need to be in place to support the development of equitable utility regulation and climate action in each New England state?
3. What are the most impactful steps that states can take in the near term? What steps are more difficult and/or time consuming to accomplish and why?
4. Are these steps equitable? If not, how do we make them equitable?
5. How do we address issues of lobbying, conflicts of interest, and utility control?
6. What needs to be done to enforce policies and practices? Are penalties appropriate and if so, what types?
7. How important are climate councils in ensuring meaningful progress is made? Do they have enough authority to make progress? What barriers do they face?
8. What are the key barriers to getting different kinds of stakeholders involved in the development of meaningful and equitable climate policy? What characterizes effective stakeholder engagement in the case of PUCs?

Endnotes

1. In practice, states have different names for their public utility commissions: Connecticut – Public Utilities Regulatory Authority, Maine – Maine Public Utilities Commission, Massachusetts – Department of Public Utilities, New Hampshire – New Hampshire Public Utilities Commission, Rhode Island – Rhode Island Public Utilities Commission, Vermont – Vermont Public Utilities Commission.

2. States have different names for their public utility commissions: Connecticut – Public Utilities Regulatory Authority, Maine – Maine Public Utilities Commission, Massachusetts – Department of Public Utilities, New Hampshire – New Hampshire Public Utilities Commission, Rhode Island – Rhode Island Public Utilities Commission, Vermont – Vermont Public Utilities Commission.

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