
ENVS 401 Community-Engaged Practicum
Middlebury College
Autumn 2018

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About the Authors

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Acknowledgements

Thank you to our community partners at EAN, Jared Duval and Sarah Wolfe, who helped shape this project and provided expertise and guidance along the way. This project would not have been possible without the support of Professor Dan Suarez and Diane Munroe, our community coordinator. Finally, we would also like to give a special thanks to our ES 401 classmates, who provided insightful comments and feedback throughout the semester.

Finally, we would also like to extend our gratitude to all of our interviewees, who were extremely generous with their time and candor. Specifically, we interviewed the following experts:

California


Matthew Harrison: Climate Investments Branch, California Air Resources Board

Vermont

Mary Sprayregen: Director, Public and Policy Affairs at VEIC

Brian Woods: Environmental Analyst, Dept of Environmental Conservations, Air Quality & Climate Division. Lead Staff person for RGGI in VT.

Linda McGinnis: Previous Lead Economist at World Bank, currently board member at EAN

Massachusetts

Bill Lamkin: Environmental Engineer - Massachusetts Department of Environmental Protection. Policy Design for RGGI.

Eric Friedman: Director, Leading by Example Program, Massachusetts Department of Energy Resources

New York

Jared Snyder: Deputy Commissioner, Office of Air Resources, Climate Change and Energy at NYSERDA

Anne Tarpinian: NYS Senate Energy and Telecom Sr. Counsel/Committee Director

Anonymous: Energy policy expert, New York State Department of Public Service
International

**Brittney White**: Policy Analyst, Climate Change, Nova Scotia Environment

**Adam Scott**: Senior Advisor at Oil Change International, currently based in the U.K.
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Vermont within the Greater Context of Climate Change

The state of Vermont has a well-earned, long standing reputation as a champion of environmentalism and progressive policy. However, in the face of the impending climate emergency, made evermore clear by the 2018 Special Report of the Intergovernmental Panel on Climate Change (IPCC), and compounded by many others like it detailing the reckless danger of current levels of burning fossil fuels, it is clear that modest achievements in climate policy are no longer enough.

While at a global level this seems like an insurmountable task, many U.S. states have made progress in reducing emissions. Between 1990 and 2014, seven U.S. states reduced their annual carbon emissions by 10% or more; over the same period, Vermont’s emissions rose by 7.1%.

![States with Double-Digit CO₂ Emission Declines, 1990-2014](image)

**Figure 1:** Emissions changes in selected U.S. states, 1990-2014. Reproduced from EAN’s 2017 Annual Report.

Granted, Vermont started with a lower-carbon mix of electricity supply than many other regions, thanks to the contributions of the Vermont Yankee nuclear plant and subsequently hydroelectric power imported from Québec. But if it is to reach the ambitious goals - most notably the target of meeting 90% of energy needs with renewable sources by 2050 - outlined in its Comprehensive Energy Plan (CEP), it will need to act more aggressively. With only 20% of that need being met by renewables as of 2017, a “business as usual” approach will not suffice, as shown in Figure 2.
Despite these challenges, Vermont has made major strides. The state has made substantial progress in bringing renewable sources onto its electric grid. But its transportation and thermal sectors, each of which consume substantially more total energy, have lagged behind (Figure 3). This discrepancy formed the original basis of our partnership with the Energy Action Network, which seeks to examine the successes of Vermont in the electric sector and of other states in the transportation and thermal sectors to identify possible high-impact courses of action to increase the share of renewable sources across all sectors.

Figure 3: Relative size and renewable share of energy use in three sectors and the total Vermont economy. Green indicates renewable sources. Reproduced from EAN’s 2017 Annual Report.
Introduction

Our partnership with Jared Duval and Sarah Wolfe, directors of the Energy Action Network (EAN), began at a pivotal moment in the organization’s trajectory. EAN recently established the Energy Futures Initiative, which gathers a subset of their existing membership to draw attention to lingering questions, tensions, and debates in Vermont’s energy arena. The Initiative’s stated aim is to leverage existing EAN networks and spark new collaboration among state energy leaders. The Initiative’s ultimate mission is to help transition Vermont’s energy system to 90% renewable by 2050 in an equitable fashion, thereby achieving goals laid out in VT’s Comprehensive Energy Plan. But, how can we do this? Multiple interviewees referred to this problem as the “million-dollar question.” This report neither provides, nor seeks to offer, a silver bullet to solve this problem. Rather, we hope it will contribute to the Initiative’s first steps as it embarks on this journey through the unpredictable labyrinth of energy policy.

In the Phase I of our partnership, Jared and Sarah identified New York, Massachusetts, and California as leaders in domestic energy policy with important lessons that Vermont could learn from. Specifically, they asked us to create individual State Profiles to succinctly display key metrics and describe policies driving this leadership. These snapshots reflect each state’s greenhouse gas (GHG) emissions and economic trends. Furthermore, each State Profile outlines one pertinent policy and delves into a brief political and economic analysis. To formulate these State Profiles, we conducted extensive data gathering, modelling, and document analyses.

Building on the State Profiles, Phase II of our project consisted of in-depth research and interviews with twelve private, government, and non-governmental leaders across Vermont, California, New York, Massachusetts and Canada. After delving into technical information in Phase I, we wanted to learn from policy experts who are neck-deep in these issues. To this end, we conducted semi-structured interviews with people across the states and provinces. In these conversations, we addressed a variety of topics as we grappled with what was important, what common themes appeared, and how we could take these perspectives and leverage them into something that would advance EAN’s efforts. As students, we were able to approach these interviews with little assumed bias, which set the stage for candid conversations.

In order to seed the Initiative’s ongoing dialogue and help inform the early stages of its work, this report relays the most compelling patterns and insights that arose from our conversations. Most notably, three key themes emerged: (1) green leadership requires cross-state collaboration; (2) a sector-by-sector approach streamlines coordination; and (3) the steps needed to reach long-term goals will require some short-term compromises.

Many of our interviewees independently expressed a notable level of excitement surrounding the Transportation Climate Initiative (TCI), which was established in 2010 by the Georgetown Climate Center and states in the Northeast and Mid-Atlantic. However, no concrete steps have been taken
and TCI is not getting the attention and resources that it needs to realize its potential to effect change. In our concluding remarks, we present TCI as an initiative that embodies cross-state collaboration using a sector-by-sector approach. Based on our conversations, we believe that TCI is one of the most salient opportunities for future coordination on the east coast to tackle transportation emissions. We recommend EAN, and the members of the Energy Futures Initiative, continue to explore avenues to leverage this existing policy framework and strengthen its tenets in the future.
Phase I: State Profiles & Policy Deep Dives

Our partners at EAN identified New York, California, and Massachusetts as key leaders in the energy space for policy and technological innovation. Our partners, Sarah and Jared, and provided parameters to conduct baseline investigations, which took the form of State Profiles (see Appendix). These two-page state summaries present a significant amount of economic and carbon emissions data in an easily digestible format. We produced these graphics using data we had gathered to expand and update existing EAN datasets. The State Profiles aim to contribute to EAN’s policy discussions by enhancing understanding of key trends and patterns. Below are the front pages of each State Profile. Full State Profiles, including the policy deep dives, are attached in the Appendix.

State Profiles

Attached below.
Economic size and political will allows CA to serve as an incubator for innovative and aggressive policy.

California

2015 PER CAPITA CO₂ EMISSIONS

9.3 tons per person
National average: 16.3 tons per person
National ranking: 2nd

CO₂ EMISSIONS BY SECTOR

CO₂ EMISSIONS DECOUPLING

CLEAN ENERGY JOBS

ENERGY COSTS

TOTAL CLEAN ENERGY JOBS: 519,158
Climate and economic powerhouse of the East possible by influential leadership and effective investment

New York

2015 PER CAPITA CO₂ EMISSIONS

8.5 tons/person
National Average: 16.3 tons/person
National Ranking: 1st (lowest emissions)

CO₂ EMISSIONS BY SECTOR

CO₂ EMISSIONS DECOUPLING

ENERGY COSTS

TOTAL CLEAN ENERGY JOBS: 148,453
NGO legal action incited stricter regulations under the Global Warming Solutions Act

Massachusetts

CO₂ EMISSIONS BY SECTOR

2015 PER CAPITA CO₂ EMISSIONS
9.7 tons per person
National average: 16.3 tons per person
National ranking: 5th

CO₂ EMISSIONS DECOUPLING

ENERGY COSTS

TOTAL CLEAN ENERGY JOBS: 117,669
Policy Deep Dives

In this section of the report, we provide extensions to the Policy Deep Dive sections of the State Profiles. Organized by state, we introduce each policy and why it is important, explain how it works, and highlight some of its achievements and challenges. Finally, we delve into a policy discussion based on reflections from our interviews.

California

California has a myriad of climate policies, but its cap-and-trade program, the Western Climate Initiative (WCI), is considered an “insurance policy” to meet the state’s legally mandated targets.¹ We chose to focus on WCI because of its recognized effectiveness and its readiness to join forces with other states, such as Vermont. For example, CA is a leading member of WCI and assists other jurisdictions by creating tools and frameworks, such as the Comprehensive Instrument Tracking System Service (CITSS) for tracking carbon emissions. As the 5th largest economy in the world, California’s membership to WCI will continue to strengthen the carbon market and legitimize it as an option for other states.

<table>
<thead>
<tr>
<th>Western Climate Initiative (WCI)</th>
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<tbody>
<tr>
<td><strong>Purpose</strong></td>
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<tr>
<td>The WCI is an international greenhouse gas cap-and-trade market, created to develop regional collaboration to identify, evaluate and implement strategies to reduce emissions across borders. It has a goal of reducing emissions to 15% below 2005 levels by 2020.² California has its own target of reaching 40% below 1990 levels by 2030 and has committed to the WCI until at least that year.³</td>
</tr>
<tr>
<td><strong>Background</strong></td>
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<tr>
<td>California legally authorized a cap-and-trade program when it passed the Global Warming Solutions Act (AB 32) in 2006.⁴ In 2013, the state joined the WCI, which is managed by WCI Inc., a nonprofit corporation with six full time staff and a board of representatives from the member jurisdictions.</td>
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<tr>
<td><strong>Timeline</strong></td>
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<tr>
<td>• 2007-2008: Several western states sign onto the Regional Climate Action Initiative and design the cap-and-trade program</td>
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<tr>
<td>• 2010: Completion of design for a cap-and-trade program that could be adopted independently by states and provinces, then subsequently linked</td>
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² http://www.co2offsetresearch.org/policy/WCI.html
• 2013: California and Quebec implement the cap-and-trade program separately
• 2014: California and Quebec formally link, forming the first international carbon market
• 2017: Ontario adopts the program and California extends its commitment to 2030
• 2018: Ontario links to CA and QC but drops out in July after the election of Premier Doug Ford. In May, Nova Scotia joined and began using WCI’s trading software but is not linked to the larger market.

Design
Initially, WCI regulated facilities that emit over 25,000 mtCO2e annually from electricity generation, commercial and industrial process emission sources. But in 2015, it expanded to include gasoline and diesel combustion from the transportation sector, as well as residential, commercial, and industrial fuel combustion facilities. Fuels used exclusively for aviation and marine purposes are not covered.

Detailed Information on the Emissions Trading System
Cap and Trajectory (measured in MtCO2e): the initial cap was set at 162.8 in 2013. After the scope expanded in 2015, it increased to 394.5 then decreases steadily to 334.2 in 2020, eventually reaching 193.8 in 2031.
Carbon Price per tCO2e: $15.06 (Q4 in 2017)
2018 Price Floor: $14.53, increases 5% annually plus inflation
Emissions covered: 85%
GHG covered: CO2, CH4, N20, SF6, HFCs, PFCs, NF3 and other fluorinated GHGs
Point(s) of Regulation: Electricity at the point of generation or upon delivery into the state. Large industrial facilities at the source. Transportation fuels prior to distribution.
Allowances: distributed by the California Air Resources Board (CARB) via quarterly auctions or free allocation.
Compliance and Enforcement: entities with emissions of at least 25,000 tCO2e per year must have their emissions data reports verified by an independent third-party. Others must implement internal audits for the data reported. Those who do not report properly can face serious penalties.

Linkages
Member governments negotiate linkage agreements after meeting certain requirements. Jurisdictions looking to join WCI must: (1) have emissions-reductions programs equivalent to or stricter than those of established members; (2) have the capacity to enforce regulations under the...

5 http://www.co2offsetresearch.org/policy/WCI.html
6 http://www.co2offsetresearch.org/policy/WCI.html
8 https://icapcarbonaction.com/en/?option=com_etsmap&task=export&format=pdf&layout=list&systems[]=45
linkage agreement; (3) have enforcement of program requirements equal to or stricter than member states; and (4) not impose significant liability on members for any failure associated with linkage.  \(^{11}\)

Achievements
Since 2013, WCI auctions have generated $6.4 billion of revenue—some of which returns directly to ratepayers on utility bills, with the rest going towards the Greenhouse Gas Reduction Fund. \(^{12}\) From there, the funds support projects such as clean transportation, high-speed rail, and other climate investments. By law, a minimum of 35% of proceeds must go towards low-income and disadvantaged communities, but in practice it reaches closer to 50%, a major success for social justice groups. \(^{13}\)

As of January 2018, California decreased its emissions by approximately 10% since 2004 and is ahead of schedule to meet its 2020 targets. \(^{14}\) While this is not solely due to the WCI, many of our interviewees attributed this momentum to the policy’s long-term goals and decreasing cap on carbon. Crucially, they were also able to decouple emissions from GSP growth; in fact, they lead the nation in GSP per capita and employ 500,000 residents in clean jobs, compared to 18,000 in fossil fuel generation. \(^{15}\) The 2017 legislative extension, which secures California’s participation in the WCI until at least 2030, affirms the successful implementation of this carbon market.

Discussion: WCI
One of the greatest strengths of WCI is a fundamental aspect to any cap-and-trade program: the cap puts a strict limit on emissions and provides predictability to industry and businesses. Since WCI is transparent with its cap trajectory, corporations can plan accordingly, and jurisdictions can rely on emissions reductions well into the future. For instance, Adam Scott, a senior advisor at Oil Change International, was very adamant about the benefits of long-term certainty. In his own words, “the longer-term the targets, the better.” \(^{16}\) He added that, “a substantial amount of the economy has options in the long run; with a well-designed program, most industries will stay intact. They can thrive if they are on the cutting edge of this because they will be rewarded for early investment in the area that the economy is headed”. \(^{17}\) In order to ensure long-term success, Scott stressed the importance of durability. In our dynamic political sphere with ever-changing leadership, he suggested that it would be crucial to engage with the public during policy discussions. With popular

\(^{11}\) https://olis.leg.state.or.us/liz/2017I1/Downloads/CommitteeMeetingDocument/149710
\(^{15}\) https://olis.leg.state.or.us/liz/2017I1/Downloads/CommitteeMeetingDocument/149710
\(^{16}\) Adam Scott, personal communication. November 2018
\(^{17}\) Adam Scott, personal communication. November 2018
support, he notes that policies can survive the change in government, making them durable in the long-run.\textsuperscript{18}

California successfully garnered support for WCI from various interest groups and stakeholders so that it gained this type of durability. In order to do so, supporters pushed the narrative of cost-effectiveness. We learned about the successful policy advocacy behind WCI by speaking with Thomas Erb, who works at the World Bank in the Carbon Markets and Innovations group. Certain interest groups and Republican representatives, who would typically oppose environmental policy, got on board with WCI because they viewed it as the most cost-effective solution compared to other policy options.\textsuperscript{19} In fact, “Big Oil, building trades, agriculture, clean technology, economists and Chambers of Commerce across California emphasized the importance of meeting emissions reductions goals while also growing a strong economy”.\textsuperscript{20} Therefore, WCI was able to pass with the support of diverse stakeholders and earn long-lasting support. As Erb explains, “an inclusive discussion led to a more substantial negotiation that ended with each party claiming victory—which minimized the potential for political backlash, lawsuits, and a referendum on cap and trade”.\textsuperscript{21} In the long run, he concluded that it was worth the effort to ensure that the groups on the “other side of the aisle” had a seat at the negotiation table.

Our interview with Matthew Harrison from the California Air Resources Board (CARB), the institution that provides administrative and management services to WCI, emphasized the additional benefits that arise from auction proceeds, especially in an equity sense. He explained that the programs are designed to respond to different state and stakeholder priorities, and noted the diverse landscape of investments across the state.\textsuperscript{22} For example, he cited transit programs designed to serve urban areas with low income communities, and carbon sequestration projects such as methane digesters in rural areas.\textsuperscript{23} In order to ensure funds are delegated to social justice projects, he noted that there was a big push from activist stakeholders. As a result, spending is responsive to community needs so that “investments are real and meaningful”.\textsuperscript{24} In other words, the economic benefits are not just a trickle-down effect—they go directly to the community. Harrison did highlight the tension between getting projects up and running quickly and taking the time to consider the equity portion. While this can pose a challenge, he offered advice to other institutions in this position: engage in community outreach early on and provide solid technical support.\textsuperscript{25} California’s effective investments of WCI-generated funds are crucial to the overall success of the program. It is a nuanced area of work that other states can learn from, whether or not they are part of WCI.

\textsuperscript{18} Adam Scott, personal communication. November 2018  
\textsuperscript{19} Thomas Erb, personal communication. November 2018  
\textsuperscript{20} Erb, Thomas. A Case Study in Environmental Pluralism. 69  
\textsuperscript{21} Erb, Thomas. A Case Study in Environmental Pluralism. 80  
\textsuperscript{22} Matthew Harrison, personal communication. November 2018  
\textsuperscript{23} Matthew Harrison, personal communication. November 2018  
\textsuperscript{24} Matthew Harrison, personal communication. November 2018  
\textsuperscript{25} Matthew Harrison, personal communication. November 2018
Ultimately, policy-makers involved in creating WCI were transparent and flexible with stakeholders on both sides of the aisle. This minimizes the potential for political backlash while accounting for the present and future needs of diverse communities.
New York

Our partners initially tasked us to explore regulations on delivered fuels in New York. As we began to investigate the status of proposed regulations, we realized that there is not much public information available, if any, as these conversations are currently underway. Given this situation, we turned our attention to the Regional Greenhouse Gas Initiative (RGGI). New York has been a member state of RGGI, a regional cap-and-trade system on electric sector carbon emissions, since it was launched in 2009. RGGI has been a key policy supporting and driving New York’s leadership in the energy arena and generates funds for investments in renewables and energy efficiency projects. RGGI has served as a springboard for Governor Cuomo’s Reforming the Energy Vision (REV) which began in 2014. REV builds on key tenets of RGGI, and together, these policies reflect what we believe are the most critical programs in New York.

Regional Greenhouse Gas Initiative (RGGI)

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<tr>
<td>The Regional Greenhouse Gas Initiative (RGGI), a program that puts a cap on carbon emissions from the electric sector, was launched in 2009 by a coalition of states and territories in the Northeast. These states include: Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, Delaware and Maryland. Membership has been consistent throughout party leadership changes for almost every participating state in the last decade, with the exception of New Jersey (former Governor Chris Christie pulled New Jersey out of RGGI, but Governor Phil Murphy is working to bring New Jersey back in). In addition to New Jersey’s renewed participation, Virginia is also</td>
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Figure 4: RGGI member states. EAN Speaker Series November 15, 2018.
currently in the process of joining RGGI.\textsuperscript{26} The RGGI participating states are committed to comprehensive, periodic program reviews to consider program successes, impacts, and design elements.

\textbf{Purpose}

RGGI began as a pilot project to test to the viability of a cap-and-invest program in the Northeast, setting a regional cap on carbon emissions from the region’s power plants. Since 2009, RGGI has been a prominent policy in the Northeast and has been crucial to drive down electric-generated emissions.

As of 2017, RGGI states have set a target of cutting carbon by at least 30\% by 2030. In 2030, the cap on electric-sector emissions will be 65\% lower than RGGI’s first year (2009).\textsuperscript{27}

\textbf{How does it work?}

RGGI’s cap-and-trade program functions as power plant owners buy carbon allowances from states through quarterly auctions, granting them the right to pollute. These costs trickle down to consumers, who end up paying for the allowances on their electric bills.\textsuperscript{28} By putting a cap on carbon emissions, plants have decreased their emissions over time and transitioned to cleaner generation.

RGGI states regulate individually and spend their RGGI-generated revenue, i.e., the revenue from the allowances power plants buy, on a state-by-state basis. RGGI funds helped to generate policies through the creation of programs and institutional regulations. These programmatic initiatives had a more profound impact on emissions than the price impact (cost of electricity); as in the electric sector, price has a limited impact on demand.\textsuperscript{29}

RGGI has a strong stakeholder engagement process that is open to public comments, i.e., stakeholders have the opportunity to suggest changes. In the stakeholder engagement process, RGGI stakeholders model assumptions about cost of fuels, electricity demand, and additional costs associated with these overarching models.\textsuperscript{30}

\textbf{Achievements}

Since it began in 2009, RGGI has been a successful cross-state market-based mechanism to cut carbon pollution and improve the lives of people living in RGGI states. RGGI states have come together and allocated financial and political resources to maintaining the program’s health and resilience over the last ten years. RGGI collaborative state leadership has resulted in two

\begin{footnotes}
\item[26] EAN Speaker Series November 15, 2018
\item[27] https://www.nrdc.org/experts/bruce-ho/rggi-agrees-cut-power-plant-pollution-another-30
\item[28] https://www.yaleclimateconnections.org/2018/03/reggie-states-addressing-transportation-emissions/
\item[29] EAN Speaker Series November 15, 2018
\end{footnotes}
successful cap decreases over the ten-year period.

In addition to cross-state collaboration, there are four key strengths of RGGI. Specifically, RGGI has (1) saved consumers money on energy bills; (2) provided public health benefits due to decreasing pollutants in the air; (3) led to regional economic growth; and (4) created jobs in the RGGI states.

(1) **Cost savings:** due to state investments (money from auctions) in energy efficiency and renewable energy, consumers have saved more than $618 million on energy bills. Furthermore, electricity prices have decreased by approximately 3.4% since 2009.

(2) **Public health:** RGGI public health benefits have been valued at $5.7 billion. These cost savings can be attributed to cutting carbon, as well as other toxic pollutants such as soot and smog, from the air. Specifically, carbon pollution from the region’s power plants has decreased by more than 40%.

(3) **Economic growth:** RGGI has contributed to at least $2.9 billion in regional economic growth, amounting to about a 25% growth in the regional economy.

(4) **Job creation:** regional employment has grown by more than 30,000 job-years, which is equivalent to one year of full-time employment for one person.

The Analysis Group conducted a study on RGGI from 2015-2017. The analysis concluded that in this time period “the RGGI program led to $1.4 billion of net positive economic activity in the nine-state region...[including] over 14,500 new job-years (or about 5,000 new jobs per year), cumulative over the study period, with each of the nine states experiencing net job-year additions.” Overall, RGGI states reduced spending on imported fossil fuels by $1.37 billion. These statistics reveal RGGI’s successes and the importance of the program to fostering environmental stewardship in New York and the Northeast at large.

**Future targets**
Looking forward, RGGI’s pollution cap is slated to decline 2.5% per year through 2020, and 3% per year between 2021 and 2030 (as demonstrated below). This decline will help RGGI states reach carbon goals established in 2017: RGGI states agreed to cut carbon by at least 30% by 2030. This target projects that by 2030 at least 132 million more short tons of carbon pollution will be avoided, which is equivalent to avoiding one year’s worth of emissions from over 25 million cars.

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Discussion: RGGI

Our interviews presented a myriad of perspectives on the effectiveness, or lack thereof, of RGGI. Overall, many of our interviewees acknowledged RGGI’s ability to drive down emissions in the region, but highlighted some shortfalls of the program, especially in the context of decreasing the cap and the possibility of expanding RGGI to the thermal and transportation sectors.

Vermont has, thus far, played a major role in RGGI’s successes. Vermont was among the first to sign RGGI and since then has been a critical leader in driving its policy. Specifically, Vermont has been a key player in involving state leaders in RGGI negotiations and in instituting a revenue recycling policy for RGGI, which led to the “cap & invest” rather than “cap & trade” model. Vermont is a leader in spending RGGI funds on weatherization especially in low-income housing (which go through Efficiency Vermont) to have some impact in the thermal sector as well. Brian Woods sums up many of RGGI’s successes. He believes that it is remarkable that states have rallied behind RGGI given the constraints of state authority and changing federal administrations. According to Woods, RGGI’s major strengths are that it (1) puts a cap on carbon; (2) reinvests the auction proceeds towards efficiency programs to support additional emissions reductions.35

However, RGGI’s successes should be taken with a grain of salt. RGGI puts a relatively high cap on carbon for a part of the economy that was already moving towards cleaner generation. In the Northeast, carbon emissions from the electricity sector were already set to fall as coal was replaced with natural gas while renewables and energy efficiency grew.36

A NY State Policy Expert touched on the role of increasing energy efficiency in the context of RGGI’s allowance structure. This expert argued that RGGI can actually be counterproductive as

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RGGI allowances can be banked for five years into the future. As such, allowances serve as an opportunity to emit carbon, as opposed to functioning as a cap: what was intended as a ceiling becomes an allowance instead. This expert explained that RGGI has incentivized an increase in clean energy, which reduces the amount of energy required from fossil fuels. As a result, there is less demand for carbon allowances, which can make it cheaper for fossil fuel generators to buy allowances and stay within the RGGI cap. By bringing down loads, a smaller number of generators are needed to produce the total load. This example is not meant to condemn energy efficiency measures, but rather demonstrate why setting a more aggressive rate of decline on the cap is critical to increasing the policy’s effectiveness.

In this vein, many of our interviewees were skeptical of RGGI’s effectiveness and believed that there are ways to strengthen the policy through “better political interest and strength.”37 For example, Jared Snyder offered that RGGI could evolve by adding smaller power plants as well as adding more states to the coalition.38 Moreover, a NY state energy policy expert, who has been in the field for over 20 years, strongly advised a change in the RGGI cap structure. This expert claimed that “RGGI is superfluous unless RGGI caps are increasingly aggressive and used to drive down emissions.”39 This Expert’s opinion is an important one and is critical to consider in thinking of ways to strengthen RGGI’s political framework.

The potential to expand RGGI versus creating another regulatory body to tackle the transportation and thermal sectors was a highly contentious topic in our interviews. As Snyder offered, expanding RGGI to cover the transportation sector is one possible solution, but it would be immensely challenging. RGGI states act by consensus, and getting all the RGGI states aligned is difficult.40 Woods echoed Snyder, saying he believes the future of RGGI is uncertain because executives in participating states have different appetites for expanding RGGI and it is not entirely clear that there is enough support region-wide.41 This lack of support is highlighted by the absence of any discussion of the topic in the most recent RGGI program review.42 Based on our interviews, which we will discuss in Phase II, we were given the impression that it was unlikely that RGGI will expand to tackle the transportation and thermal sectors.

37 Tomas Erb, personal communication. October 2018.
38 Jared Snyder, personal communication. October 2018.
40 Jared Snyder, personal communication. October 2018.
41 It is possible, however, that a regional transportation program could move forward with a subset of the states.
Reforming the Energy Vision (REV) is a policy that has emerged from RGGI and continues to play a role in promoting a cleaner energy future for NY. REV builds on RGGI by means of expanding clean energy initiatives beyond just the electric sector. REV has over 40 initiatives to “build a clean, resilient, and more affordable energy system for all New Yorkers”. These initiatives are categorized into seven general areas: renewable energy, building & energy efficiency, clean energy financing, sustainable & resilient communities, energy infrastructure modernization, innovation & research and development and transportation.

<table>
<thead>
<tr>
<th>Reforming the Energy Vision (REV)</th>
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<tbody>
<tr>
<td><strong>Background</strong></td>
</tr>
<tr>
<td>The Reforming the Energy Vision (REV) is New York’s Governor Andrew M. Cuomo’s comprehensive energy strategy to create clean, resilient and affordable energy for New Yorkers. REV works in conjunction with RGGI to help NY meet its clean energy goals.</td>
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<tr>
<td><strong>Purpose</strong></td>
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<tr>
<td>REV has nine key goals to be achieved by 2030. Included in these nine goals are the following three key initiatives:</td>
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<tr>
<td>1. 40% reduction in greenhouse gas emissions from 1990 levels</td>
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<td>2. 50% of electricity must come from renewable sources</td>
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<td>3. 600 trillion Btu increase in statewide energy efficiency (at source) from 2012 levels</td>
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<tr>
<td><strong>How it works</strong></td>
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<td>Under this comprehensive energy strategy, REV helps consumers make more informed energy choices, develop new energy products and services, and promote environmental stewardship. These three dimensions have created new jobs and economic opportunity throughout the state. REV is relevant to thinking about the ways in which state institutions, specifically, the New York Public Service Commission (PSC), the New York Energy Research and Development Authority (NYSERDA), the New York Power Authority (NYPA), and the Long Island Power Authority (LIPA) can work together to realize Cuomo’s strategy for a clean, resilient, and more affordable energy system.</td>
</tr>
</tbody>
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43 https://rev.ny.gov/rev-initiatives
44 https://rev.ny.gov/rev-initiatives
45 https://rev.ny.gov/
46 https://static1.squarespace.com/static/576aad8437c5810820465107/t/5aec725baa4a9171e5890dd4/1525445212467/REV-fm-fs-1-v8.pdf
47 https://rev.ny.gov/about/
Successes
REV’s goals corroborate a myriad of programs in New York that coincide with larger RGGI goals. Furthermore, there are several state efforts that are working to advance REV. For example, as approved by the NYS Public Service Commission (PSC), the Clean Energy Fund (CEF) serves is one of the key programs used to advance REV. The CEF aims to:

- To deliver on its primary goals to reduce greenhouse gas emissions
- Increase renewable energy generation
- Increase energy efficiency
- Achieve scale in clean energy markets

These primary CEF goals dovetail with the RGGI investment parameters and offer an opportunity to leverage CEF and RGGI funds to help achieve overall REV objectives.

Discussion: REV
REV and RGGI have been critical to New York’s commitment to a cleaner energy future in the state and region. Governor Cuomo’s recent leadership to expand RGGI’s main principles through REV demonstrates how strong political will in New York is critical to engage citizens and create more resilient policies. Chairman of Energy and Finance for New York Richard Kauffman reflects RGGI and REV’s progress and role in NY’s energy arena, “Governor Cuomo’s leadership on RGGI shows how smart, bipartisan policy beats rhetoric every time. Today’s RGGI proposal, working in concert with the Governor's REV policy and Clean Energy Standard, sends the message to the nation that climate change is real and the future is clean and renewable energy”. 48

Massachusetts

The Global Warming Solutions Act (GWSA) of Massachusetts was one of the original policies that our partners at EAN identified for us to look into as an exemplary case of state climate policy. They were interested in the GWSA for several reasons, chief among them its comprehensive nature and legally binding enforceability. They were interested in the ways that the GWSA laid the groundwork for the state to set goals that would guide policy decisions across all branches of government. In addition, they wanted to know more about how the GWSA’s legally binding commitments could be enforced to compel government action in the face of future resistance. We set out to gather multiple sources of information through document analysis and stakeholder interviews.

### Global Warming Solutions Act (GWSA)

#### Background
The Massachusetts Global Warming Solutions Act was passed by the state’s legislature and signed into law by Governor Deval Patrick in 2008, boasting unanimous support from the House and broad support from both parties. The GWSA dovetailed with the Green Communities Act (GCA), which was passed the same year and set aside funding to be granted to local governments to finance efficiency upgrades at the municipal level. At the time of its passage, climate and environmental advocates hailed the GWSA as a landmark step for the state, saying that, along with other state policies such as the GCA, it positioned Massachusetts to become a leader in promoting effective climate legislation at the state level. At least one advocate cited the Bush Administration’s failure to act on the topic as a driver of the need for states to act independently of the federal government to cut greenhouse gas emissions.

#### Purpose
The primary goal of the GWSA was to establish targets for the reduction of state greenhouse gas emissions and provide the means to meet those targets. It set a long-term goal to reduce emissions to 80% below 1990 levels by 2050 and instructed the executive branch to establish an intermediary target for a reduction of between 10% and 25% below 1990 levels by 2020. In addition, it “gave state agencies broad authority to make significant reductions in commonwealth greenhouse gas emissions” through regulatory action.

#### Achievements
Despite its broad mandate and the substantial power it conferred to state agencies, many of the GWSA’s strictest provisions were not enforced in its early years. In 2016, advocacy groups brought a suit against the state government alleging that it had failed to comply with the act’s mandate that comprehensive regulations facilitating emissions reductions be instituted by 2012.

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The Supreme Judicial Court of Massachusetts ruled in favor of the plaintiffs, declaring that the Act required the state to “impose a limit on [greenhouse gas] emissions that may be released, limit the aggregate emissions released from each group of regulated sources or categories of sources, set emission limits for each year, and set limits that decline on an annual basis”. The ruling rejected the government’s argument that existing state regulations and the requirements imposed by membership in RGGI were sufficient to satisfy the Act’s requirements. Governor Charlie Baker directed state officials to develop regulations in accordance with the court ruling, and in 2017 the Department of Environmental Protection (DEP) complied, issuing new regulations aimed at cutting carbon emissions to meet the GWSA’s goals. The resulting six new regulations targeted a broad array of greenhouse gas sources using several different strategies to cut emissions. The regulations included:

- Updates to the Clean Energy Standard
- Stricter tracking of carbon allowances for electric power plants
- Restrictions on methane leaks from natural gas distribution
- Limits on emissions from the Department of Transportation and targets for overall transportation sector emissions reductions
- Limits on emissions for the state’s passenger vehicle fleet
- Restrictions on the use of sulfur hexafluoride in gas-insulated switchgear

Discussion: GWSA
In a 2015 review of the GWSA and its implementation, the author, Paige Pavone, a professor of environmental law at Columbia University, identified five reasons why the Act had failed to live up to its potential as a model for state climate legislation. Although the review was published prior to the 2016 Supreme Judicial Court ruling and the subsequent regulatory changes made to comply with it, the critiques capture many of the issues with how the GWSA has been implemented, several of which apply to the newer regulations as well. The reasons she identifies are:

1. The Act’s focus on reducing emissions within the government
2. The Act’s reliance on voluntary commitments and non-binding initiatives
3. Failure to fully implement all of the Act’s provisions
4. The Act’s commitment to maintaining economic feasibility
5. The Act’s tendency to reinforce and reiterate existing policy

It bears noting that some of these points do not reflect the GWSA’s implementation today as they did when they were published. Point 3, for example, focuses primarily on the fact that the DEP had

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not issued new regulations by the 2012 deadline, but this was rectified in the wake of the Supreme Judicial Court’s 2016 ruling. However, even these regulations provide a testament to the accuracy of some of the other points. Like the policies criticized by point 1 above, several of the DEP’s 2017 regulations focused on government emissions sources (such as the state’s passenger vehicle fleet) rather than those associated with private industry or individual citizens.

The underlying theme that unites the concerns raised under points 1, 2, and 4 above is essentially a reluctance on the part of the state government to take any action or adopt any policy that could be seen as harmful towards established industry. As Pavone notes, the GWSA contains several provisions designed to protect industry and insulate it from the Act’s effects. In practice however, any effective climate policy will inevitably have noticeable effects on industry, particularly in energy-intensive and high-polluting sectors. A well-designed policy, however, can minimize negative effects by being clear about its goals and the steps necessary to reach them. By providing a clear path from the current status quo to the desired future, policymakers can allow industry leaders to plan for coming changes and adapt accordingly without jeopardizing their entire business model. By setting targets without taking the necessary steps to assure they will be achieved, Massachusetts sets up the potential for a situation in which the state government must choose between failing to meet the targets because not enough progress has been made, or drastic action that could imperil economic growth.

Pavone’s evaluation is useful to our discussion as she has extensive background in the field. Her central critique of GWSA lies within how it has been implemented, rather than with the design of the policy itself. GWSA grants state agencies the power to promulgate specific, binding limits on greenhouse gas emissions from private industries, and if they were to do so they could with one stroke undermine Pavone’s first four points of criticism. Point 5 argues that many of the Act’s provisions could be enacted individually without the need for comprehensive legislation, and indeed many of them have been in other states. But if the state government chose to embrace the full power of the statute to pursue coordinated, aggressive emissions-reductions policies, even this critique would lose much of its force.

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56 Adam Scott, personal communication. October 2018
Phase II: Stakeholder Engagement

In the section of our report, we highlight three key themes that emerged from our conversations with policy experts across the U.S. and Canada. After completing all twelve interviews, we considered the different viewpoints and identified a few commonalities. We synthesized the various threads of thinking into three main themes: (1) the need for cross-state collaboration; (2) the tension between pursuing long-term, idealistic goals and short-term, politically viable options and; (3) taking a sector-by-sector approach. This section reflects back to readers some of the prominent ideas circulating in the energy policy sphere. These themes are not intended to be completely conclusive, but rather contributions to further policy discussions and planning.
Cross-State Collaboration

This theme arose in almost every interview that we conducted. Experts consistently noted that while Vermont’s small size can be advantageous politically, the state must engage in regional initiatives to create a significant impact. Brian Woods, an Environmental Analyst in Vermont, explained that, “smaller stakes means less bureaucracy, but carbon pricing in Vermont alone is not politically viable; regional carbon pricing makes much more sense”. This opinion was echoed throughout a few other interviews. Mary Sprayregen agreed that, “From a policy and political perspective, we’re better off working with our neighboring states to do something together.” In general, it seems like there is a need for Vermont to take an active role to engage with its neighbors and take the lead on collaboration. Although it is helpful to learn from other jurisdictions, it is not enough as merely an intellectual exercise. The message from our interviews was clear; Vermont should be working with other states, not just learning from them. A member of the New York Department of Public Service (NYDPS) who works on energy policy further added, “Collaboration of states is critical, especially in the context of a booming carbon market. Even though there is a lack of federal government support, the cost of clean energy (solar and wind) is declining and that is driving everything right now”. This statement speaks to the economic advantages of collaboration to create regional carbon pricing. Such coalitions also align with recommendations from the CEP, which states:

Vermont should work with other states and provinces in our region, building upon existing regional initiatives, to investigate and pursue options for market-based GHG emission policies that integrate with the other approaches described in this CEP, and consistent with the principles regarding revenue recycling, pace, equity and competitiveness detailed in this plan.

Clearly, many policy makers and stakeholders recognize the importance of working together, but there are certainly some disadvantages to cross-state collaboration. The biggest barrier, identified in several interviews, is getting all states to reach a consensus. This can cause significant delays and compromises, since “the state willing to do the least sets the cap” and can impede progress. Put simply, there is a lowest common denominator effect. This can slow down the process and degrade the final outcome. Plus, Mary Sprayregen noted that political actors and opinions are ever-changing, adding to the challenge of getting all states on the same page. Nonetheless, most experts agree that this work at the governmental level is worth it because it opens the door to more efficient pathways to reaching energy targets in the end. For instance, Anne Tarpinian, the Committee Director of the New York State Senate Energy and Telecom Sr. Counsel, believes in “market-based solutions to market-based problems, because the private sector is much more efficient than the government

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57 Brian Woods, personal communication. November 2018
58 Mary Sprayregen, personal communication. November 2018
59 New York Department of Public Service Employee, personal communication. November 2018
61 New York Department of Public Service Employee, personal communication. November 2018
most of the time”.62 Instead of imposing top-down policies, firms can work with each other in a competitive market to reduce emissions. Brian Woods summarizes Vermont’s position well in that it, “would be open to conversations with other states, and should join a regional market, not step out alone to create a program”.63 In order to make this happen, policy-makers need a better understanding of what a renewable energy system can look like. Adam Scott stressed the importance of explaining the actual functioning of a renewable grid to policy makers, saying “policy makers don’t understand renewables; it’s about having a flexible and integrated grid, and sharing with neighbors allows us to increase these two aspects”.64 Ultimately, Vermont has done some amazing environmental work, but in order to be a true green leader, the state’s energy policy must expand past its borders.

62 Anne Tarpinian, personal communication. November 2018
64 Adam Scott, personal communication. November 2018
Short-Term Compromises & Long-Term Goals

A theme that arose repeatedly in our interviews with experts was the need to consider how any policy would navigate the tradeoffs created by the tension between what is most possible and easiest to accomplish in the immediate future and what needs to be done to meet long-term goals. These experts expressed a variety of opinions on the topic and there was no clear consensus on the best course of action. However, there were some commonalities that emerged in how they thought and talked about the issue that we believe can be instructive when considering how best to work towards the ultimate goal of energy policy: the equitable and timely decarbonization of energy systems.

Two of our interviewees, Adam Scott and Thomas Erb, expressed clearly-articulated and apparently opposite opinions on this issue. Scott focused on the need to be explicit about the goal of reaching net zero emissions, and to only take steps that are consistent with that goal and help to move towards it. Erb, on the other hand, emphasized the idea that any policy that is implemented is more effective than one that is not, and that there will necessarily be intermediary steps that do not immediately achieve zero emissions. While these two views can appear incompatible, a more nuanced understanding and deeper consideration of the topic reveals that both are based on similar assumptions and understandings of how energy policy reaches its goals.

None of the experts we spoke with denied that energy policy must pursue a future with a zero-carbon energy system. In addition, both Adam and Thomas emphasized the necessity of taking a long view with regard to policy and considering how decisions made now will affect future decision-making and the possibility of reaching long-term goals. While Thomas was more receptive of intermediary steps that involve fewer carbon emissions while still requiring some - such as transitioning from coal to natural gas for electric generation - he agreed that locking into such technologies in the long term does not make for effective policy. On the whole, both experts’ views were deeply grounded in a belief in the necessity of being intentional and thinking strategically when making policy decisions and giving special consideration to how each individual decision makes progress - and enables further progress - towards a well-defined ultimate goal.

65 Adam Scott, personal communication. October 2018
66 Thomas Erb, personal communication. October 2018
Sector-by-Sector Approach

Many experts noted that when creating policy, tackling one sector at a time is often much more efficient than regulating carbon emissions at the economy-wide scale. Namely, a sector-by-sector approach has a narrower scope and reduces the number of interest groups and stakeholders involved. As such, many of our interviewees expressed how it can streamline policy-making. Specifically, an economy-wide policy poses a much larger coordination problem because states must reach a consensus at two levels - first, between state legislatures and second, between the regulating agencies and interest groups within those states. In this vein, our interviewees suggested that a sector-by-sector approach could be a more effective mechanism to manage the transportation and thermal sectors. To be clear, they did not discount the economy-wide approach altogether, but rather presented it as a more challenging policy pathway.

Adam Scott was an enthusiastic proponent of a sector-by-sector approach. Scott argued that a targeted approach is most effective because it (1) supports faster, more conclusive decisions; (2) mitigates coordination issues at the state-, agency- and interest group-strata; and (3) survives changing political leadership because there are fewer agencies and interest groups involved. Furthermore, Scott encouraged a sector-by-sector approach because it has proven an effective policy through RGGI. He noted that RGGI’s framework in itself is a success, although it needs to be more aggressive in order to be effective.

Bill Lamkin from Massachusetts shed light on the potential for the private interest groups (industry etc.), in tandem with state government, to play a significant role in the transition to cleaner energy generation. For example, he referred to the Massachusetts Clean Energy Center (MCEC), which is a state economic development agency dedicated to accelerating the growth of the clean energy sector and deliver statewide environmental benefits for citizens of Massachusetts. It receives funding from the Massachusetts Renewable Energy Trust Fund, which is funded by a systems benefit charge – totaling approximately 29 cents per month for the average residential customer. Lamkin explained how the MCEC spends money in very targeted ways to jumpstart key programs and projects. For example, he highlighted the support for a port facility in Bedford to construct offshore wind infrastructure, which will help Massachusetts harness additional wind power. Overall, the MCEC contributes hugely to the state’s impressive reputation as an energy efficiency and innovation hub. While it is not a specific policy in itself, it is an example of legislative support securing funds to be used in a very targeted way. As several of our interviewees stressed, such intentional spending by the private sector can create very tangible and effective results but requires government reinforcement.

68 Adam Scott, personal communication. November 2018.
69 https://www.masscec.com/about-masscec
70 https://www.masscec.com/about-masscec
Recommendations and Opportunities: Taking a Closer Look at the Transportation Climate Initiative

As we discussed earlier, Vermont is doing some great things for environmental policy, but there is certainly room for improvement. As reflected in Figure 3, the transportation sector is in desperate need of emissions reductions. One opportunity for advancement, which arose frequently in our interviews, is the Transportation Climate Initiative (TCI), a regional coalition in the Northeast formed with the purpose of tackling emissions from the transportation sector. We believe that it illustrates the strengths of the aforementioned themes; specifically, it is a sector-specific initiative that collaborates across borders. TCI is a great opportunity for Vermont to take a strong leadership role and engage with its neighbors to drive this coalition forward. However, it is important to note that in Vermont, the executive branch of the state government is up for election every two years. As we will touch on later, in the section “Looking Forward”, this could detract from the state’s ability to be an effective leader. Thus, we suggest that non-governmental institutions galvanize public support and action for TCI that will outlast a changes political power.

Background
The transportation sector is responsible for almost half of the emissions from all RGGI states and is the largest source of CO2 emissions nationally. According to an article by Jan Spiegel of Yale University, transportation poses the biggest problems for coordinated governance. In response to this challenge, the Georgetown University Climate Center founded the Transportation Climate Initiative (TCI) in 2010. But since then, there have been very few concrete actions taken; it has neither received the attention it needs nor the attention it deserves.

Purpose
Georgetown and the participating states, i.e., Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Washington D.C., Vermont, and Virginia, came together to discuss a regional transportation program. They decided to solely tackle transportation, as regional transportation emissions make up more than a third of GHG emissions. Furthermore, it became clear through the RGGI process that it would be much easier to tackle one sector at a time.

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73 https://www.yaleclimateconnections.org/2018/03/reggie-states-addressing-transportation-emissions/
Namely, each sector has its own language and state agencies, and coordination and compliance become more complicated with the addition of government, private and public players across multiple states. In addition, transportation is also a challenging issue to tackle because (1) it involves cross state travel (which makes tracking emissions difficult); and (2) almost all fuel comes from out of state, which complicates addressing individual cars and/or upstream fuel. Kathleen Theoharides, Assistant Secretary of Climate Change in Massachusetts, sums up these caveats. She states, the “key challenge of transportation is ‘the amorphous nature of it and millions of people making millions of small decisions daily, and also the need for most people to get in a car each morning and drive somewhere’”. As evident, a regional program such as TCI, as opposed to individual state leadership, is the most viable path forward.

Steps Taken
The following outline a few key events that have taken place over the last four years:

- A 2015 report by the Georgetown Climate Center and Cambridge Systematics reflected that a comprehensive implementation of state clean transportation policies could reduce carbon emissions by 29-40% by 2030 and increase economic growth between $11.7 billion and $17.7 billion by 2030, while creating 91,000-125,000 jobs. Also in 2015, a subset of the states (VT, CT, DE, DC, RI) announced interest in a market-based mechanism to address transportation emissions. These conversations generated excitement but were vague in terms of details.
- In 2017, another subset of states (including VT) announced a series of listening sessions around the region to hear what stakeholders were interested in. Those listening sessions recently concluded, and the states released a “laundry list” of what they learned.
- By the end of 2018, the states (still unclear whether it will be all of the TCI states or a subset) are expected to release an announcement about next steps. This announcement will reflect clear proposal that states can respond to, with a clear identification of which states are ready to move forward.

Looking Forward
Due to the lack of progress since 2010, it is critical that TCI states take a strong leadership role, especially post 2018 elections. In EAN’s first speaker series held in mid-November 2018, the stakeholders shared some possible leadership pathways:

1. Leadership needs to come from a state with a long-standing governor. For example, Vermont and New Hampshire elect governors every two years, which makes it difficult to build and carry out policies over time.

76 https://www.yaleclimateconnections.org/2018/03/reggie-states-addressing-transportation-emissions/
2. New York has always been a leader, and given Cuomo’s likely political ambitions, they seem poised to continue playing a leadership role.
3. Massachusetts’s Governor Baker is court mandated (under the Global Warming Solutions Act 2008) to do more on climate, which gives him slightly different motivation.
4. Virginia’s Governor Ralph Northam is one year into single four-year term (cannot be re-elected). He is pushing very hard to join RGGI and advance TCI in that term: Virginia is in the process of joining RGGI and VA just joined TCI in September.

Vermont’s Role in Advancing TCI
The most recent EAN Speakers Series (November 2018) gathered EAN members and relevant stakeholders to discuss Vermont’s role in TCI. In order for Vermont to implement the TCI, the legislature need to take action and support the initiative with funding. Luckily, Vermont already has a statute (10 V.S.A. 578 (d)) that requires the administration to advocate in favor of national or regional cap and trade/cap and invest programs for the transportation and thermal sectors including joining WCI or expanding RGGI. Thus, Vermont’s participation in strengthening TCI seems very likely.

Equity Considerations
Transportation is a nuanced and multi-faceted issue, especially when consumers may have little control over their transportation use. In rural Vermont, there are few options for public transit. As such, it will be critical for TCI to account for low-income drivers who cannot afford more fuel-efficient cars and ensure that the program does not solely provide EV incentives for wealthy drivers.80

In an article by James Bushnell, professor of economics at UC-Davis, he echoes the importance of accounting for low-income drivers. Bushnell reflects on California’s development of its transportation emissions program and offers a solution for low-income residents:

There are lots of ways to try to offset the impacts on average for individuals without necessarily subsidizing their incentives to drive…you want to find somebody who is hurt by the increase in charges, but you don’t want to insulate them completely. So you want their income to reflect the benefits of this charge, but you don’t want to give them an incentive to drive more.81

Bushnell’s considerations are highly applicable to Vermont’s landscape and should be at the forefront of discussions moving forward. Furthermore, the reinvestment of the program’s revenues can be used to account for rural areas where there are many low-income residents who have to travel long distances. The reinvestments make take the form of (1) direct rebates based on vehicle

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80 https://www.yaleclimateconnections.org/2018/03/reggie-states-addressing-transportation-emissions/
81 https://www.yaleclimateconnections.org/2018/03/reggie-states-addressing-transportation-emissions/
miles traveled, or enhanced subsidies for low-income people to purchase more efficient or electric vehicles; and (2) community planning that advocates for walkers and bikers (if appropriate).82

What TCI Means for VT
In our interviews, Adam Scott emphasized the role of Electric Vehicles (EVs) in the context of tackling the transportation issue in rural Vermont. Jared Snyder, New York Deputy Commissioner of Air Resources commented, it is a ripe time for states to invest in EV infrastructure, as it will yield petroleum and economic savings in the long-run.83 Scott further asserted that the range and infrastructure for EVs are increasing quickly and EVs look like a better alternative to building up public transportation. With this in mind, Scott suggested that it is possible for jurisdictions like Vermont to ban internal combustion engines by 2030, since EVs will be cheaper than fuel vehicles in future years.84 But as transportation is electrified, there will be a corresponding increase in demand for electricity. In order for this shift to be productive, the additional electricity needs to come from renewable generation. Therefore, RGGI will play an increasingly significant role in limiting carbon emissions from the electricity sector in the Northeast.

Jared Snyder asserts:

We have these interlocking systems in the Northeast, both the power system and the transportation system, so it makes sense to work together…Another lesson from RGGI is the way a well-designed policy can provide a suite of benefits – economic benefits, environmental benefits, public health benefits. We are trying to determine how to achieve those kind of benefits in the transportation sector as well.85

Ultimately, regional achievements in the transportation sector will only be realized with collaborative policy-making, public outreach and education in the region. TCI appears to be the most promising option and Vermont needs to prioritize it in policy planning.

82 https://www.yaleclimateconnections.org/2018/03/reggie-states-addressing-transportation-emissions/
84 Adam Scott, personal communication. November 2018.
85 https://www.yaleclimateconnections.org/2018/03/reggie-states-addressing-transportation-emissions/
Conclusion

Vermont’s energy system spans across state borders and its energy policies should too. The state has a strong history of environmentalism and many Vermonters hold this tenet close to their identity. But at the same time, there can be a reticence to look beyond borders in search of ways of changing how things are done. Bill McKibben shared these sentiments in a recent class discussion: “Vermont is an interesting place … Its reputation is very green, but in certain ways it’s incredibly resistant to change. It’s the second oldest state in the union in terms of population, which doesn’t make it any easier. But, on the other hand, being small in scale makes opportunities here.” McKibben, like nearly every expert we spoke to, emphasized the pressing need to act quickly and decisively. Based on our interviews, we believe that the most effective way to do this is by combining the expertise of as many people as possible through extensive cross-boundary collaboration. Working with other states is not only beneficial for its own sake, but also because it increases the exposure and cross-pollination of policy ideas and innovations across state boundaries. With an issue of the magnitude of climate change, there can never be too many people pursuing solutions provided there is sufficient communication and collaboration between them. We contribute our report as one small step toward this larger endeavor.

Appendix

See attached state profiles below.
Economic size and political will allows CA to serve as an incubator for innovative and aggressive policy

California

2015 PER CAPITA CO₂ EMISSIONS

9.3 tons per person
National average: 16.3 tons per person
National ranking: 2nd

CO₂ EMISSIONS BY SECTOR

CO₂ EMISSIONS DECOUPLING

CLEAN ENERGY JOBS

ENERGY COSTS

TOTAL CLEAN ENERGY JOBS: 519,158
KEY POLICIES

• **Member of WCI**
  - Funds appropriated by legislature; program designed to be flexible

• **Renewable Portfolio Standard**
  - **Final target:** 100% of all retail sales by 2045
  - **Milestones:** 33% by 2020 | 44% by 2024 | 52% by 2027 | 60% by 2030
  - **Specific Requirements:** Utilities must collectively procure 1,325 MW of storage by 2020, delivering to the grid by 2024 at transmission, distribution, and consumer-sited levels.

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**Policy Deep Dive: Western Climate Initiative**

• Economy wide cap-and-invest program that covers 85-90% of emissions across all three sectors
  - **Target:** 15% below 2005 emissions level, which is 657 MtCO2e
  - **2017 Price Floor of $18.5,** set to rise annually by 5% plus inflation

• Investments have supported over 200,000 rebates and projects, directed by California Air Resources Board

• **Factors contributing to political support:**
  - Cost-effectiveness (decoupling emissions from GDP)
  - Environmental pluralism that reflected the interests of various interest groups
  - Leadership from environmental groups
  - Transportation sector not included until 2015 to avoid concern about increased retail prices
Climate and economic powerhouse of the East possible by influential leadership and effective investment

New York

2015 PER CAPITA CO₂ EMISSIONS

8.5 tons/person
National Average: 16.3 tons/person
National Ranking: 1st (lowest emissions)

CO₂ EMISSIONS BY SECTOR

CO₂ EMISSIONS DECOUPLING

ENERGY COSTS

CLEAN ENERGY JOBS

TOTAL CLEAN ENERGY JOBS: 148,453
NY KEY POLICIES

- Member of RGGI
  - RGGI States regulate and spend their RGGI-generated revenue on a state-by-state basis
- Renewable Portfolio Standard (expired 2015)
- Clean Energy Standard (2016)
  - Final Target: 50% of utilities’ procurement by 2030
  - Three tiers: 1&2 cover RES; 3 covers nuclear as a bridge to 50% renewables

POLICY DEEP DIVE: RGGI

- Launched in 2009 by states in the Northeast including Vermont, New York and Massachusetts, among others
  - Growing membership: NJ rejoining, VA in-process of joining
- Regulates electric sector: carbon emissions from power plants → cap and invest program
- Four strengths:
  - Cost savings: investments in efficiency and renewables → $618 million on energy bills
  - Economic growth: $2.9 billion (25% growth in regional economy)
  - Job creation: 30,000+ job-years (one year of full-time employment for one person)
  - Public health: $5.7 billion
- Power generators emitted 120 MTCO2 Eq. in 2009 compared to 86 MTCO2 Eq. in 2014 (with increased renewables)
- 2017 Program Review: set emissions to decrease by 30% by 2030 (relative to 2020 levels)
- Works in conjunction with more recent state policies, such as Governor Cuomo’s Reforming the Energy Vision (REV) launched in 2014
  - More state-led administrative decisions focused on energy-related policy and decision-making
  - Greater coordination between regulatory bodies in NY, such as NYSERDA and NYPA
  - Increased communication between utilities and customers
NGO legal action incited stricter regulations under the Global Warming Solutions Act

Massachusetts

2015 PER CAPITA CO₂ EMISSIONS
9.7 tons per person
National average: 16.3 tons per person
National ranking: 5th

CO₂ EMISSIONS BY SECTOR

CO₂ EMISSIONS DECOUPLING

CLEAN ENERGY JOBS
TOTAL CLEAN ENERGY JOBS: 117,669

ENERGY COSTS
KEY POLICIES

• Member of RGGI
  • RGGI states regulate and spend their RGGI-generated revenue on a state-by-state basis

• Renewable Portfolio Standard
  • Milestones: 15% by 2020, increasing 1% per year thereafter, with no expiration date
  • Specific Requirements: 1,600 MW of solar by 2020 | Minimums only apply to energy systems installed after 1997. Existing facilities are subject to much less stringent standards

POLICY DEEP DIVE:
Global Warming Solutions Act

• Passed in 2008 with unanimous bipartisan support
• Sets goals for GHG reductions below 1990 levels: 20% by 2020 and 80% by 2050
• Requires implementation of regulations to meet stated goals
• 2016 Supreme Judicial Court ruling required updates to DEP regulations to keep in line with emissions goals
• Strong growth of clean energy jobs since passage
• Criticized for focus on low-hanging fruit (e.g. government emissions, voluntary initiatives) and failure to fully enforce some provisions